Tuesday 22 June 09.30–10.45
Basic Science – Smooth Muscle Physiology
Chairmen: M. Drake and N. George

013

Y-27632, a Rho-kinase inhibitor, inhibits proliferation and adrenergic contraction of prostatic smooth muscle

R.W. REES*, N.A. FOXWELL†, D.J. RALPH‡, P.D. KELL‡, S. MONCADA† and S. CELLEK†
**Institute of Urology & WIBR, UCL, London; †WIBR, UCL, London; ‡Institute of Urology, UCL, London, UK*

INTRODUCTION

Benign prostatic hyperplasia (BPH) gives rise to lower urinary tract symptoms by elevating smooth muscle tone (dynamic component) and causing prostatic enlargement (static component). Currently, medical therapies for BPH are aimed at either reducing the rate of prostatic cellular proliferation (5-[alpha] reductase inhibitors) or reducing smooth muscle tone ([alpha]-receptor antagonists). Rho-associated kinase is known to be involved in both the calcium sensitizing contractile mechanism within smooth muscle cells, and smooth muscle cell proliferation in other tissues. The objective of this study was to examine the effect of a selective Rho-kinase inhibitor (Y-27632) on both these pathways within the prostate.

MATERIALS AND METHODS

Primary culture of smooth muscle cells was developed from human and rat prostate explants. Cell viability and proliferation were studied using neutral red/thiazolyl blue (MTT) and 5-bromo-2'-deoxyuridine (BrdU) incorporation assays respectively. Apoptosis was measured using propium iodide staining intensity in the presence of RNAase. Using superfused tissue chambers, the effect of Y-27632 on contractions elicited by noradrenergic nerve stimulation and phenylephrine was examined in rat prostate strips.

RESULTS

The cell cultures displayed a gradual increase in cell number and BrdU incorporation over 48 h, but this increase was significantly reduced in the presence of Y-27632, with a maximum inhibition of approximately 40% at 100 μM Y-27632. There was no induction of apoptotic cell death in the presence of Y-27632.

Y-27632 inhibited noradrenergic contractions elicited with electrical field stimulation and phenylephrine-induced tone in a concentration-dependent manner (IC50 = 17.8 ± 4.8 μM and 7.8 ± 2.1μM respectively).

CONCLUSIONS

Our results show that Y-27632 reduces the proliferation rate of human and rat prostatic smooth muscle cells, and also inhibits adrenergic contractions of rat prostate tissue. The greater efficacy of Y-27632 in inhibiting tonic contractions over phasic contractions fits with previous data suggesting that Rho-kinase inhibitors may be more efficacious in situations where there is increased basal tone, such as BPH. 'Dual action' Rho-kinase inhibitors could provide a single potent agent for the treatment of BPH.

014

Detrusor contractility and the role of intracellular and extracellular Na

D. BESARANI, C. WU and C. FRY
Institute of Urology & Nephrology, UCL, UK

INTRODUCTION

Variation of intracellular and extracellular [Na+] can in principle profoundly affect smooth muscle contractility, indirectly via its innervation or directly by affecting intracellular Ca^2+ homeostasis. Detrusor smooth muscle can be exposed to a variable [Na+] from either compartment, e.g. during hypoxia when intracellular [Na+] rises as Na-pump activity is attenuated, or during changes of urothelial Na+ transport. However, there is no systematic investigation of changes to intracellular and extracellular [Na+] on detrusor function, and this was the object of the study.

METHODS

Guinea-pig detrusor strips were superfused with a HEPES-buffered solution (37°C, pH7.4).

Nerve-mediated contractions were elicited by field-stimulation or contractures with 10 μM carbachol. Extracellular [Na] was varied by isosmotic substitution of NaCl with Tris-Cl. 10 μM strophanthidin blocked the Na-pump. Data are mean ± SD, Student's *t*-test examined differences between sets.

RESULTS

Reducing extracellular [Na] attenuated nerve-mediated contractions (EC50 81 ± 9 mM, $n = 5$), but augmented carbachol-induced contractures. The recovery time constant was greater for the effect on contractures (46.8 ± 15.0 vs 3.0 ± 1.1 min, $P < 0.001$). Strophanthidin increased carbachol-induced contractures (4.2 ± 1.0-fold) and recovered with a similar time course to the effect of low-[Na] solutions on the contractures.

CONCLUSIONS

Na+ exert dual effects on detrusor muscle. Reduction of extracellular [Na] reduces nerve-mediated actions but has a direct inotropic effect on the muscle. The similarity of the effects of low-Na solutions and strophanthidin suggest the muscle actions are exerted by changing the intracellular [Na+]. The data are of interest as they suggest a route whereby hypoxia – through Na-pump blockade – could generate bladder over-activity.

015

Frequency-dependent actions of adenosine on human and guinea-pig detrusor smooth muscle

M. HUSSAIN, Y. IKEDA, C.H. FRY and A.R. MUNDY
University College London, UK

INTRODUCTION

In detrusor ATP and Ach are co-released from motor nerves: (1) in sympathetic nerves, the proportion of neurotransmitters released varies with stimulation frequency; (2) we tested this hypothesis of differential release in guinea-pig and human bladder, and the modulatory effect of adenosine.

MATERIALS AND METHODS

Detrusor strips were obtained from guinea-pig and human bladders (ethically approved), and superfused at 37°(HCO_3^-/CO_2 solution, pH 7.35). Tetrodotoxin-sensitive contractions were evoked by field-stimulation. Student's t-test compared differences between means (± SD),*$P < 0.05$.

RESULTS

1 mM adenosine reduced force relatively more at low than at high frequencies.

In guinea-pig tissue 10 μM alpha,beta-methylene ATP (ABMA) reduced force less at 20 Hz, T20, than at 2Hz, T2 (Control T2/T20 = 0.19 ± 0.07; ABMA 0.06 ± 0.04*, $n = 10$). Conversely, 1 μM atropine reduced force more at 20 Hz compared to 2 Hz (Control T2/T20 = 0.17 ± 0.04; atropine 0.28 ± 0.11*, $n = 12$).

ABMA had a similar effect in stable human detrusor (T4/T40 0.19 ± 0.11 vs 0.10 ± 0.05 control vs ABMA). The effect of atropine could not be investigated, as atropine-resistant contractions were proportionately very small.

CONCLUSIONS

Adenosine attenuated nerve-mediated contractions more at low frequencies: this frequency-dependence correlated with a greater depressant effect of ABMA; but contrasted with that of atropine, in guinea-pig. ABMA prevents post-junctional ATP effects, whilst atropine antagonizes muscarinic receptors. This is consistent with the hypothesis that adenosine affects preferentially the ATP, compared to Ach, release from motor nerves.

*TABLE 1 1 mM adenosine and contractile force,*high vs low frequencies*

	Guinea-pig ($n = 12$)		Human stable bladders ($n = 8$)		Human unstable bladders ($n = 6$)	
Frequency (Hz)	2	20	4	40	4	40
% Control	37.3 ± 19.9	86.1 ± 7.4*	3.1 ± 8.5	20.9 ± 11.7*	2.5 ± 3.8	30.8 ± 31.5*

REFERENCES

1 Bodin P, Burnstock G. *Neurochem Res* 2001; **26**: 959–69.
2 Todorov LD, Mihaylova-Todorova ST, Bjur RA, Westfall DP. *J Pharmacol Exp Ther* 1999; **290**: 24124–6.

016

The protective effect of extracellular acidosis on contractile failure in corpus cavernosal smooth muscle

P. KUMAR, S. MINHAS, C. Y. LI, D.J. RALPH and C.H. FRY
Institute of Urology, London, UK

INTRODUCTION

In patients with ischaemic priaprism, corporal blood aspirates show evidence of metabolic depletion, as evidenced by low PO_2, low pH and low glucose. One hypothesis for this condition is reduced contractile function of corpus cavernosal muscle, that may in turn be due to one or more of the metabolic changes described above. This study aims to determine which metabolic insults are most significant in determining loss of contractile function.

MATERIALS AND METHODS

Isometric contractions were recorded from strips of guinea-pig corpus cavernosum in response to electrical field stimulation (EFS at 60 Hz, sensitive to 1 μM tetrodotoxin). Strips were superfused at 37°C with a HCO_3^-/CO_2 buffered solution (pH 7.39). Ischaemia was mimicked by omitting substrate (glucose/Na pyruvate), reducing pO_2 (3 kPa), or reducing extracellular pH (7.02), either alone of in combination. Data are mean ± SD.

RESULTS

Substrate depletion had no significant effect on the EFS response after 60 min, ($n = 12$); hypoxia had only a minor and reversible effect (87 ± 15% of control). However, both hypoxia and substrate depletion reduced tension to 14 ± 10% of control, with little recovery after 60 minutes in normal superfusate (27 ± 16%). Extracellular acidosis alone also reversibly depressed tension to about 70%. However, acidosis limited the depression of tension by hypoxia and substrate depletion (32 ± 8%) and also enhanced the recovery in normal superfusate (73 ± 8%).

CONCLUSION

A combination of hypoxia and substrate depletion exerted an injurious and only partially reversible effect on EFS contractions that was greater than the sum of their individual effects. Extracellular acidosis however partially protected against this detrimental action.

017

NCX-911 (nitric oxide-releasing sildenafil) relaxes human corpus cavernosum and rat anococcygeus in nitric oxide deficient conditions

J.S. KALSI*, S. CELLEK† and D.J. RALPH‡
**Institute of Urology, London; †Wolfson Institute for Biomedical Research; ‡Institute of Urology, London, UK*

INTRODUCTION AND OBJECTIVES

NCX-911 is a NO-releasing derivative of sildenafil. The aims of this study were to assess the effects of NCX-911 on human corpus cavernosum (HCC) in the absence of endogenous NO and secondly on anococcygeal muscle from diabetic rats.

MATERIALS AND METHODS

The effects of NCX-911 and sildenafil were assessed on phenylephrine-induced tone and nitrergic relaxation of HCC in absence/presence of an inhibitor of NO synthase (L-NAME; 500 mM). Furthermore their effects were assessed on phenylephrine-induced tone and nitrergic relaxation of anococcygeal muscle obtained from controls and diabetic rats (16 weeks after induction of diabetes). Anococcygeal muscle is a widely accepted model to study nitrergic neurotransmission.

RESULTS

NCX-911 and sildenafil relaxed HCC with a similar efficacy (EC50 733.1 ± 94.4 nM and 800.7 ± 155.8 nM respectively). The potency of NCX-911 was not altered but that of sildenafil decreased significantly in the presence of L-NAME (EC50 980.4 ± 106.7 nM and 2446.7 ± 256.8 nM respectively). Both compounds potentiated nitrergic relaxations with similar potencies.

NCX-911 and sildenafil relaxed anococcygeal muscle in the control group with a similar efficacy (EC50 = 1088.8 ± 165.0 nM, and 827.1 ± 167.3 nM respectively). The potency of NCX-911 was not altered but that of sildenafil was significantly reduced in diabetes (EC50 = 1765.9 ± 303.5 nM and 2842.2 ± 640.3 nM respectively). 80% of nitrergic responses were lost in the diabetic group.

CONCLUSIONS

These results suggest that endogenous NO derived from nitrergic nerves is significantly decreased in diabetes. Furthermore, NO-releasing PDE5 inhibitors could potentially be used in the treatment of ED in conditions where there is a lack of endogenous NO.

018

Hypoxia promotes superoxide formation in isolated corpus cavernosal smooth muscle cells

A.J. KOUPPARIS, S. MUZAFFHAR, J.Y. JEREMY, R. PERSAD and N. SHUKLA
Bristol Royal Infirmary, UK

INTRODUCTION

Hypoxaemia has been associated with vasculogenic erectile dysfunction (VED), through unknown mechanisms. In the flaccid state the corpus cavernosum is also hypoxic. Hypoxia is associated with increased formation of superoxide (O_2^-) which reacts with nitric oxide (NO) to form peroxynitrite (ONOO). In turn, this reduces the bioavailability of NO, which is a principal cause of impaired penile erection. In order to explore this area further, the effect of hypoxia on O_2^- formation (and its enzymic source) in rabbit cavernosal smooth muscle cells (CVSMCs) was investigated.

METHODS

Cultured CVSMCs derived from normal rabbit penis were incubated in hypoxic conditions for 2 h at 37°C, in the presence of superoxide dismutase (SOD), apocynin and DPI (both NADPH oxidase inhibitors). Superoxide dismutase (SOD)-inhibitable O_2^- formation was assessed using the reduction of ferricytochrome c measured spectrophotometrically.

RESULTS

Following a 2-h incubation, O_2^- formation (mol/mg protein [mean ± SEM, n = 6]) in hypoxic cells was significantly increased to 28.36 ± 0.91 compared to 8.76 ± 1.21 in normoxic cells. In hypoxic cells, O_2^- formation was significantly reduced by the NADPH oxidase inhibitors, apocynin (to 13.37 ± 1.98) and by DPI (to 13.97 ± 1.46).

CONCLUSION

These data demonstrates that hypoxia in rabbit cavernosal cells increases O_2^- production, an effect mediated by activation of NADPH oxidase. Since hypoxia is associated with VED and O_2^- negates NO-mediated erection, this mechanism warrants further consideration as a possible aetiological factor in VED. The pharmacological inhibition of NADPH oxidase may also be a possible therapeutic approach to treating VED.

019

Urinary guarding reflex: aberrant in spinal cord injury?

A.V. BALASUBRAMANIAM*†, J. BYCROFT*†, S. WOOD†, F.R.I. MIDDLETON†, C. FOWLER‡ and M.D. CRAGGS*
**Institute of Urology and Nephrology, UCL; † RNOH NHS Trust; ‡Institute of Neurology, UCL, UK*

INTRODUCTION

The 'urinary guarding reflex' (GR) refers to the progressive involuntary increase in the activity of the external urethral sphincter during bladder filling. The activity peaks just before the onset of micturition and characteristically disappears before a voiding contraction. Spinal cord injury (SCI) can result in the development of aberrant reflexes. Our aim was to assess whether the GR in SCI is aberrant by monitoring pelvic-pudendal reflexes and their modulation during the micturition cycle.

MATERIALS AND METHODS

Using pudendal afferent nerve paired-pulse stimulation the pudendo-anal reflex (PAR) was monitored as a surrogate marker of striated external urethral sphincter activity with: voluntary pelvic floor contraction; at end-fill-volume (PARefv); and voiding/neurogenic detrusor overactivity (PARvoid/ndo). Values were standardized to the PAR of the empty bladder (= 1), pooled (mean ± SD) and statistical comparisons were made between healthy and SCI subjects.

RESULTS

PAR responses were facilitated by voluntary pelvic floor contraction in healthy and SCI subjects (healthy and incomplete SCI: $P < 0.05$). In the 5 healthy subjects PARefv was high (1.4 ± 0.16) and PARvoid was low (0.3 ± 0.2). In the 8 incomplete SCI subjects the PAR rose during fill (PARefv 1.2 ± 0.3) and then dropped during ndo (PARndo/void 0.9 ± 0.6, $P < 0.05$). In the 5 complete SCI subjects PAR was constant during fill (PARefv 0. 9 ± 0.2, $P < 0.05$) and increased during ndo (PARvoid/ndo 1.2 ± 0.4, $P < 0.05$).

CONCLUSIONS

The GR was found to be aberrant in SCI subjects. Degrees of facilitation and aberrance of the GR reflects residual suprasacral influences on the sphincter and pelvic floor muscles that normally originate in the brainstem.

020

An electrified catheter to resist encrustation by *Proteus mirabilis* biofilm

A. CHAKRAVARTI*, S. GANGODAWILA*, M.J. LONG†, N.S. MORRIS†, A.R.E. BLACKLOCK* and D.J. STICKLER†
**University Hospitals of Coventry and Warwick, Walsgrave Hospital; †Cardiff School of Biosciences, Cardiff University, UK*

INTRODUCTION

To study the effect of iontophoresis by electromotive force and oligodynamic property of noble metal to resist urinary catheter encrustation.

MATERIALS AND METHODS

Four glass bladder models were catheterized with 16F silicone catheters, three of which had 0.25 mm silver wires, running through the lumen and alongside. Two wired catheters had the silver wires connected to a 9 volt DC source supplying a steady current of 150 micro amperes via a self regulating circuit, connected to a galvanometer. Artificial urine was instilled into the bladder model at 0.5 mL/min. The bladder urine was inoculated with a clinical strain of *P. mirabilis* that had been isolated from an encrusted catheter. The models were operated until the test catheters blocked. Bacterial colony count, silver ions, and pH were checked every 24 h. Three such experiments were done. Time to blockage, colony counts, pH, and scanning electron microscopy was used to assess encrustation in electrified and control catheters.

RESULTS

The time to blockage of the electrified catheters were seven times longer than the control. The colony counts were halved in the bladders with the test catheters and pH was lower. The silver ion concentration in the bladders containing the electrified catheters were double the concentration in the control, but they gradually decreased with time until the test catheters blocked.

CONCLUSION

Electromotive force on a noble metal releases ions which have oligodynamic property to inhibit bacterial growth. This principle can be used in preventing encrustation in long term urinary catheters.

Tuesday 22 June 15.00–16.15
Clinical Management of Prostate Cancer
Chairmen: J. Anderson and R. Kirby

034

Management of T1c prostatic carcinoma in the UK: 1999–2002

D.J. PAINTER*, S. FOWLER† and A.W.S. RITCHIE‡
**Gloucestershire Royal Hospital; †BAUS Cancer Registry; ‡Gloucestershire Royal Hospital and BAUS Cancer Registry, UK*

INTRODUCTION

The optimal management of organ confined, impalpable prostatic carcinoma remains under debate. Previous studies have suggested a majority of UK urologists would favour radical prostatectomy over other treatment options for younger men with lower PSA levels (Donovan *et al. BMJ* 1999: **318**; 299–300). The aim of this study is to report the actual management of men diagnosed with T1c prostate cancer in the UK between 1999 and 2002.

PATIENTS AND METHODS

Data were obtained from the BAUS Cancer Registry comprising 7425 new cases of T1c prostatic carcinoma diagnosed between 1999 and 2002. Patients were subdivided according to age, PSA level and treatment intention.

RESULTS

Between 1999 and 2002, the proportion of patients with prostatic carcinoma staged as T1c increased from 14% to 18.8%. Treatment decisions were recorded for approximately 50% of cases in each year. For those men under the age of 70 with a PSA less than 20, the commonest management strategy was consistently radical radiotherapy. For those patients managed with curative intent in 2002, radical radiotherapy (with or without adjuvent hormones) was reported as the chosen treatment five times more often than radical surgery. The number of men being treated with brachytherapy is

approaching the number undergoing radical prostatectomy, whilst active surveillance is becoming a more common option for low PSA disease even in younger patients.

CONCLUSION

In the UK, although the majority of urologists have been reported to favour radical surgery in the treatment of 'curable' T1c prostate cancer, it appears radical radiotherapy remains the commonest management strategy.

035

PSA results after iodine seed prostate brachytherapy – UK data with up to 5 years follow up

P. SOORIAKUMARAN, A. HENDERSON, S. AHMED, R.W. LAING and S.E.M. LANGLEY
Royal Surrey County Hospital, UK

INTRODUCTION

We report early outcome data for patients who underwent prostate brachytherapy (BXT) with up to 5 years follow up.

PATIENTS AND METHODS

Of 404 patients we have treated to date, we report biochemical outcomes for 302 patients with >9 months follow up (mean follow up 24.8 months; range 9–61 months). Patients were classified into low (48.3%), intermediate (37.4%), and high (14.2%) risk categories based on their Gleason sum, presenting PSA, and clinical stage. Patients received either BXT alone (31.8%), BXT with 3m neoadjuvant androgen deprivation (NAAD) (46.4%), or a combination of 3 months' NAAD, 45 Gy EBRT, and BXT (21.9%).

RESULTS

Prostate cancer survival was 100%; no deaths occurred with rising PSA. 12 patients (4%) experienced biochemical evidence of treatment failure (ASTRO). Actuarial PSA free survival for all patients was 94% at 60m; there was no significant difference in actuarial survival in hormone-naïve versus hormone-treated patients nor between patients in different risk categories; all groups were >90%. At 30 months median PSA nadir was 0.4 for all patients ($n = 76$); 0.2 for low risk ($n = 34$), 0.22 for intermediate risk ($n = 27$), and 0.45 for high risk ($n = 15$) groups. 64/76 (84%) patients had a 30-month PSA <=1.

CONCLUSION

These early results demonstrate the effectiveness of brachytherapy in the treatment of early prostate cancer.

036

Laparoscopic radioactive guided sentinel lymphadenectomy for prostate cancer

T. NAMBIRAJAN, S. JESCHKE, N. Al BQAMI, K. LEEB, J. ZIEGERHOFER and G. JANETSCHEK
Elisabethinen Krankenhaus, Linz, Austria

OBJECTIVE

To develop and study a technique for laparoscopic radioisotope guided sentinel lymphadenectomy (SLA) for prostate cancer in conjunction with laparoscopic radical prostatectomy.

PATIENTS AND METHODS

Laparoscopic SLA was performed in 50 patients (mean age 65 years, range 47–75). The inclusion criteria was PSA more than equal to 5ng/mL or Gleason score more than or equal to 7. Mean pre-operative PSA was 9.92 ng/mL (2.16 ng/mL–25.4 ng/mL). Three millilitres of Tc^{99m} (200 MBq) colloid was injected in three locations of each prostatic lobe, 24 h prior to surgery. Scintigraphy was performed. A laparoscopic gamma probe, 10 mm in diameter, with a lateral energy window at 90° was used (Ethicon, Austria). Radioactivity was measured *in situ* prior and after SLA as well as within the removed nodes. The sentinel lymph nodes (SLN) were sent for frozen section and if positive for micrometastasis an extended pelvic lymphadenectomy was performed.

RESULTS

Mean operative time was 50 (32–95) min. Of the 100 pelvic sidewalls studied, the location of sentinel lymphnodes is shown in Table 1. 58% of sentinel lymph nodes were outside the obturator fossa. Histopathology showed

TABLE 1 Location of sentinel lymph nodes

Location	Number
Obturator fossa	24
External iliac	23
Internal iliac	15
Common iliac	8
Presacral	6
Obturator+Ext iliac	4
Obturator+Int iliac	4
Obturator+Com iliac	1
No activity	21

micro-metastasis to SLN in 5 (10%) patients. 80% of these metastasis were outside the obturator fossa. LN-metastasis was exclusively found in 99m-Tc marked LN.

CONCLUSIONS

Laparoscopic SLA is feasible and detects micrometastasis outside the conventional area of lymphadenectomy.

037

Prostate cancer care in Scotland – describing the journey

C.M. GOODMAN* and R.N. MEDDINGS†‡
**Department of Urology, Ninewells Hospital, Dundee, UK; †Department of Urology, Ayr Hospital, Ayr, UK; ‡for the Scottish Urological Cancer Audit Steering Committee*

INTRODUCTION

Clinicians involved in the delivery of care to patients with urological cancer in Scotland have participated in a comprehensive audit involving all new cases diagnosed over a 2-year audit window from January 2001.

PATIENTS AND METHODS

New cases were identified using complimentary methods, including clinician registration, hospital pathology and biochemistry department listings, and the Scottish Cancer Registry. The data collected for each patient was a superset of the BAUS cancer audit dataset. Previous Cancer Registry data projected 3640 new cases of prostate cancer in the audit window.

RESULTS

There was a high level of clinician involvement and a substantial increase in the case volume passing to BAUS. 3718 new cases of prostate cancer have been registered (102% of projected). Delays between referral and diagnosis were substantial (only 26% diagnosed within 4 weeks, only 46% within 8 weeks). TRUS biopsy has become the predominant method of diagnosis (58% of total), with most (73%) being performed by urologist. Documentation of tumour staging in the hospital health record remains poor (29% no record of T stage). There is substantial variation in treatment practice: of 17 centres registering 50 or more patients (range 65–496), the percentage of the centre total receiving radical surgery ranges from 0–21%, radical radiotherapy 3–32%, surveillance only 0.3–19%, and hormone therapy (non-adjuvant) 36–72%.

CONCLUSION

This prospective audit has described current prostate cancer management in a large population in unprecedented detail. Reasons for variations in practice will be discussed.

038

Observations on the use of technetium bone scan for staging prostate cancer from SUCA 2001–2003

R.N. MEDDINGS* and C.M. GOODMAN†
**Ayr Hospital; †Ninewells Hospital, Dundee, UK*

INTRODUCTION

Clinicians involved in the delivery of care to patients with urological cancer in Scotland have participated in a comprehensive audit involving all new cases diagnosed over a 2-year audit window from January 2001. We present data on the use of technetium bone scan in staging new prostate cancer cases.

PATIENTS AND METHOD

New cases were identified from clinician registration, hospital pathology, biochemistry listings and Scottish Cancer Registry. A

superset of BAUS cancer audit dataset was used.

RESULTS

3718 new cases of prostate cancer have been registered. Over 60% of newly diagnosed cancers had a bone scan. 22% of the scans were indicative of metastatic disease. 12.5% of the total registered cancers were diagnosed with metastatic bone disease. 17.5% of scans were done in patients with PSA levels of <10 and 40.3% in those <20. 46.8% of patients presented with a PSA of <20 of which 54% had bone scans for staging. In the patients with PSA <10 who had bone scans, 3.5% indicated metastatic disease where the PSA was <20, 9.6% indicated metastatic disease.

CONCLUSIONS

This prospective audit of current urological practice indicates a significant use of technetium bone scan for staging patients with PSA levels of <20. In this unscreened prostate cancer population the % of patients with metastatic disease with PSA levels <10 and <20 are higher than previous reported. Consideration of staging protocols for radical local interventions and variations in practice will be discussed.

Funding: Clinical Resource and Audit Group (CRAG), now NHS Quality Improvement Scotland (NHSQIS).

039

Diethyl stilboesterol versus bicalutamide in hormone refractory prostate cancer. A prospective randomized trial

R. MANIKANDAN, S.J. SRIRANGAM, E. PEARSON, S.C.W. BROWN, P.H. O'REILLY and G.N. COLLINS
Stepping Hill Hospital, Stockport, UK

INTRODUCTION AND AIM

To compare the efficacy of diethylstilboestrol with bicalutamide in the treatment of hormone refractory prostate cancer in relation to its effect on prostate specific antigen (PSA) and survival.

METHODS

Patients on LHRH analogues for carcinoma prostate with evidence of biochemical or clinical progression were randomized into one of the treatment arms ($n = 58$). The first group (Group A) ($n = 26$) received 1mg of diethylstilboesterol with 75 mg of aspirin per day in addition to the primary hormonal treatment. The second group (Group B)($n = 32$) received bicalutamide at a dose of 50 mg per day in addition to the primary treatment. Patients were followed up every 3 months with their PSA being checked and were also monitored for any clinical progression and adverse effects as a result of treatment. Failure of treatment was defined as a 50% or greater increase in PSA after commencing treatment. Once randomized all patients were followed up for survival regardless of failure of second line hormonal manipulation.

RESULTS

The mean age of the patients were 76.7 (60–88, SD 7.4) in Group A and 76 (67–86, SD 6.9) in Group B. The median follow up period for both groups were 24 months (range 6-48 Group A) (range 3-54 Group B). 65% of the patients in Group A (17/26) and 43.5% (14/32) in Group B had a fall in their PSA levels ($P = 0.08$, Fisher's exact test) with 27% (6/26) and 31% (10/32) having a greater than 50% response respectively ($P = 0.34$, Fisher's exact test). The median duration of response was 9 months (3–18 months) for Group A and 12 months (3–18 months) for Group B. Seven patients in Group A and six in Group B experienced adverse events. At the end of the study period 14 (54 %) of Group A patients were alive and 12 (46 %) were dead. In group B 15 (47%) were alive, 16 (50%) were dead and 1 (3%) lost to follow-up. No survival advantage was demonstrated between the two groups ($P = 0.2$, log rank).

CONCLUSION

Low dose diethyl stilboesterol and 50 mg of bicalutamide per day are equally effective in hormone refractory carcinoma prostate with respective to biochemical response, although diethyl stiboesterol may have more severe adverse effects. No survival advantage is seen between the two treatments.

040

Does insurance status offer any survival benefit for patients with localized prostate cancer?

A.R. RAO, M. LANIADO, H. MOTIWALA and O.M.A. KARIM
Wexham Park Hospital, Slough, UK

INTRODUCTION

National guidelines suggest that treatment of cancer in the private sector should not differ from the NHS. In this study we attempt to determine whether there is any difference in the service provided or clinical presentation and outcome, in patients undergoing radical prostatectomy in both the NHS and private sector.

MATERIALS AND METHODS

A retrospective audit of 113 radical prostatectomies performed by a single surgeon between 01/01/1999 and 31/12/2002 was undertaken. 72 cases were performed in the NHS and 41 cases were performed in the private sector. We analysed the patient journey from date of referral to date of discharge. We analysed PSA at diagnosis, pathological staging and margin positive rate. Mann–Whitney *U*-tests were used for data with non-parametric distributions and unpaired *t*-tests for data with parametric distributions.

RESULTS

Statistically significant results were: differences in mean age (2.96 years), mean PSA (2.1 ng/mL), median time to specialist consultation (26 days) and median time from diagnosis to surgery (50 days). All results favoured the private sector. There was no difference in positive surgical margin (NHS – 17.85%, Private – 18.91%) or continence rates (NHS – 94.64%, Private – 94.28%). In the NHS the majority of patients presented with LUTS. In the private sector, 75% of patients presented through PSA screening.

CONCLUSION

A two-tier health service exists with regard to diagnosis and treatment of localized prostate cancer. PSA correlates with stage and prognosis in prostate cancer. This may ultimately translate into a survival benefit for patients in the private sector.

Tuesday 22 June 15.00–16.00
Paediatric Urology
Chairmen: P. Cuckow and P. Ransley

046

Repair in two stages – the best option for patients with severe primary hypospadias

N. JOHAL*, T. NITKUNAN†, A. QTEISHAT†, K.J. O'MALLEY* and P.M. CUCKOW*
**Great Ormond Street Hospital; †Institute of Urology, London, UK*

INTRODUCTION

The repair of severe hypospadias represents a major surgical challenge. After initial enthusiasm for single stage procedures, many paediatric urologists have turned to the alternative two-staged approach after experiencing disappointing results. This alternative approach has been advocated by Bracka and arises out of procedures originally described by Clouthier, Duplay and Turner Warwick. One surgeon's experience in primary hypospadias repair is reported.

PATIENTS

Between 7/98 and 6/03, 104 boys underwent a two-staged reconstruction of which 62 were primary repairs. Indications for staged repair included: proximal meatus [mid-shaft (18 patients), peno-scrotal (23), or perineal (2)], severe chordee [31 pts], poor glans groove and BXO. Inner prepuce was the graft of choice. Mean age was 37.6 months at completion of surgery and mean follow-up was 30 months.

RESULTS

All grafts took well and none of the 62 required revision. One patient developed a haematoma. Maturation of the graft for at least 6 months ensured the best conditions for second stage closure. Parents described the cosmetic and functional results as 'good' or 'excellent' in 85% of cases after completion of surgery. Complications included partial glans dehiscence (3 pts), residual mild ventral curvature (3), and meatal stenosis (3).

CONCLUSIONS

Two-staged repair has proved a reliable and reproducible technique with a low complication rate in a difficult cohort of hypospadias patients. Inner preputial skin grafts take very successfully on the ventral surface of the penis and splitting the glans enables a slit-like meatus to be achieved in most cases. Excellent cosmetic results can be anticipated.

047

The island tube and island onlay hypospadias repairs offer excellent long-term outcomes a 14-year follow-up

H.M. SNYDER, A.R. SHUKLA and R.P. PATEL
Children's Hospital of Philadelphia, Philadelphia, USA

INTRODUCTION

We have utilized an inner preputial flap as a transverse island tube (IT) for the one-stage repair of proximal hypospadias when the urethral plate cannot be preserved and as an island onlay flap (IO) when the urethral plate can be preserved for over 20 years at our institution. We report long-term follow-up and an outcome comparison of these two techniques.

PATIENTS AND METHODS

We retrospectively reviewed our records for all patients that underwent proximal hypospadias repair with either the IT or IO procedure between 1980 and 1990 by one surgeon. We randomly contacted these former patients, blinded to the surgeon, to undergo a long-term outcomes review, follow-up examination, and uroflowmetry.

RESULT

Patient information could be retrieved for a total of 73 patients that underwent an IT or IO procedure during the defined time interval. We were able to contact 49 of these former patients and 30 patients agreed to participate. The IT and IO repairs were performed on 14 and 16 boys with proximal hypospadias, respectively, at a mean age of 16.8 months. At a mean follow-up of 14.2 years for both groups (144 to 253 months), two boys in the IT group (14.2%) and none having IO had developed a fistula requiring repair. Distal stenosis requiring meatoplasty occurred in 1 and 2 patients in the IT and IO groups, respectively. Urolflowmetry in 11 patients in the IT group and 14 patients in the IO groups showed mean maximal flow rates (Q_{max}) of 17.3 mL/s and 21.8 mL/s ($P = 0.343$), and mean post-void residuals (PVR) of 5.0 mL/s and 2.36 mL/s, respectively ($P = 0.249$).

CONCLUSIONS

Unlike other forms of substitution urethroplasty, vascularized flaps based on preputial skin appear to be unique in that they do not have a long-term stricture rate. The IT and IO repairs provide excellent long-term cosmetic and functional results. As the IT does have a higher incidence of post-operative complications, we have continued to extend our application of the IO to more proximal hypospadias repairs with continued success.

048

Is real complete disassembly technique lengthen epispadiac penis?

S. PEROVIC and M. DJORDJEVIC
Department of Urology, 11000 Belgrade, Serbia

INTRODUCTION

Penile disassembly for epispadias repair was first described by Mitchell. We developed technique which is based on total separation of corpora cavernosa from glans cap, neurovascular bundles and urethral plate to obtain totally free corporeal bodies for straightening and lengthening procedures.

MATERIALS AND METHOD

During the period from October 1995 to March 2003, the technique was performed on 19 patients, aged 2 days to 39 years. Penile disassembly includes complete separation of the corporeal bodies from glans cap with neurovascular bundles and urethral plate. Neurovascular bundles, short urethral plate and dorsal chordee could be limiting factors for penile lengthening. Complete mobility of separated corpora cavernosa is achieved only after mobilization of the neurovascular

bundles up to the pubic bones. If urethral plate is short it must be divided. Dorsal chordee is corrected by grafting of dorsal side in order to avoid penile shortening. The tips of the corporeal bodies are fixed to the most distal part of the hemiglanses cap using U-shaped suture. Proximally, each corpora cavernosa is fixed to the penile base skin to avoid postoperative retraction of the lengthened penis. Penis is reassembled into normal anatomical relationships.

RESULTS

Follow up was from 6 months to 8 years (mean 3.6 years). Dorsal curvature was corrected in all cases with satisfactory penile length.

CONCLUSION

Good results in urethroplasty and penile straightening are not sufficient to consider successful epispadiac repair. Final successful outcome depends on the penile length as well. Our technique represents an advance in lengthening of epispadiac penis.

049

Total phallic construction for micropenis

D.J. RALPH and A.N. CHRISTOPHER
Institute of Urology, London, UK

INTRODUCTION

This paper describes the management of micropenis by total phallic construction.

PATIENTS AND METHODS

Seven men, with a mean age of 25 years, who had had multiple operations for micropenis in childhood are included. The original diagnoses were exstrophy/epispadias ($n = 3$), pseudohermaphrodite ($n = 1$), androgen insensitivity ($n = 1$), bilateral orchidectomy ($n = 1$) and androgen deficiency following chemo-radiotherapy ($n = 1$).

The phallus was fashioned using a forearm free flap in six patients and an abdominal flap in one patient. To maintain erogenous sensation, the glans penis was incorporated into the ventral surface of the neophallus in all cases. A phallic urethra was formed in four patients. A neo-glans has been fashioned in four patients and an inflatable AMS 700CX penile prosthesis inserted in five patients.

RESULTS

All patients are very satisfied with the cosmetic appearance of the phallus and the four patients with a urethral reconstruction can void standing and are dry. All penile prostheses are in a good position with four patients having regular sexual intercourse.

Multiple complications and subsequent revision operations were needed to obtain these results. Anastamotic urethral strictures were revised in three of four patients, and prosthesis revision was needed in three patients due to poor cylinder position ($n = 2$) or to infection ($n = 1$). Wound infections occurred in three patients.

CONCLUSION

Total phallic construction for micropenis can change the life of young men by allowing them to stand to void and to have sexual intercourse. The long-term results are excellent but patients must be warned of the high complication rates.

050

Psychosocial and sexual function in the young African adult with true intersex

S. GARG, C.M. JAYACHANDRAN, P. MADHUVRATA, S. UNDRE and S.K. GARG
Hammersmith Hospital, London, UK

INTRODUCTION

A high incidence of true intersex is seen amongst the West African population. 60% present post puberty making management difficult. Our aim was to establish guidelines for the management of post pubertal true intersex in West Africa.

METHODS

Fifty-five cases of ambiguous genitalia were studied prospectively over a 10-year period.

Investigations performed were including buccal smear, urinary ketosteroids, semen analysis, urogenitogram, urethroscopy, pelvic laparotomy and gonadal biopsy.

RESULTS

Fifteen of 25 patients with true intersex presented after puberty. Histology showed 53% ovotestes, 30% ovaries, and 17% testicles. Twelve were living as males, seven of whom had a uterus and fallopian tube and were offered gender reassignment though none of them opted for it. The three living as females had well developed uterus and fallopian tubes Gonads appropriate to the assigned gender were retained. Mastectomy and hypospadias repair was performed in the males. Three of the five males without any female genital organs achieved normal libido, penetration and ejaculation. Of the seven males with female genital organs, one reported psychosocial problems and only one reported normal libido and penetration without ejaculation. All three females had vaginoplasty. One achieved pregnancy, and one became sexually active.

CONCLUSIONS

Psycho-social aspects are prime considerations in gender assignment. In male patients with functional female genital organs better sexual function maybe possible by reassigning gender. Male to female reassignment in post-pubertal patients is not socially acceptable in West Africa. The absence of well developed mullerian structures predicts male sexual function.

051

Does the type of lithotriptor used affect treatment outcome in paediatric urinary tract calculi?

A.R. RAZA, S.A. MOUSSA, G.S. SMITH and D.A.T. TOLLEY
Western General Hospital, Edinburgh, UK

INTRODUCTION

ESWL is well established in the treatment of urinary tract calculi in children. We report our experience with two different lithotriptors.

PATIENTS AND METHODS

Retrospective case note and X-ray review of children undergoing lithotripsy with the Wolf Piezolith (2300) 1988–98 and Dornier Compact Delta electromagnetic lithotriptor 1999–present. Kub ± ultrasound of renal tract performed 1–3 months post ESWL to assess stone-free status.

RESULTS

122 children: (140 renal units) m:f 82:40, age 11 months—15 years (mean 7.7 years). 28 (23%) urological/congenital abnormality, 7 (6%) metabolic abnormalities, 92% stones unilateral (left = right). Wolf Piezolith (2300): 102 renal units (75 GA sessions), stone size range 3–110 mm (mean = 27 mm) overall ancillary procedure rate 8%. stone free % for stones <20 mm (79%), for stones >20 mm and complex calculi (42%). Compact Delta: 38 renal units (40 GA sessions), stone size range 3–35 mm (mean = 20 mm), overall ancillary procedure rate 7%, stone free % for stones <20 mm (87%), for stones >20 mm and complex calculi (41%). The overall complication rate (both lithotriptors) was 26%. 9 children developed steinstrasse with 4 (44%) requiring ancillary procedures for clearance.

CONCLUSION

There was no significant difference in stone free, ancillary procedure or complication rates between the lithotriptors although the percentage requiring ga sessions was higher with the Compact delta.

There was a significant decrease in stone free rate for both lithotriptors as stone complexity and burden increased.

Tuesday 22 June 16.00–17.00
Renal Transplantation
Chairmen: D. Cranston and D. Rix

052

Impact of change of technique on the incidence of ureteric complications post-renal transplantation: a study of 1186 transplants at one centre

S. MADAAN, R. CHAHAL, S. GULERIA, H. IRVING, S. POLLARD and J.P.A. LODGE
St James's University Hospital, Leeds, UK

INTRODUCTION

Ureteric complications represent a significant cause of the morbidity associated with renal transplantation. We reported our experience of 507 renal transplants, between 1984 and 1990, using the Leadbetter-Politano ureteroneocystostomy, which were unsplinted. In this study we compare the results of more than 1000 transplants done in the last decade using an extravesical onlay, stented technique and study the impact of change of technique on ureteric complications.

PATIENTS AND METHODS

All consecutive cases of renal transplantation from January 1991 to December 2002 were included in the study. Data on the incidence and nature of ureteric complications were accumulated by retrospective case-note analysis

RESULTS

The series comprised 1186 consecutive renal transplants, in 1131 patients operated between 1991 and 2002. Over the past 11 years, 46 (3.8%) patients had ureteric complications, including ureteric obstruction and leakage. The median time of detection of ureteric complication was 4 weeks post transplantation. Ureteric obstruction was more common and was seen in 40 patients while 7 patients had urinary leakage. The lower ureter was the site of obstruction in 87.5% of cases. Endoscopic or conservative management was successful in 35 cases (78.2%), compared to 60% in the previous series. The remaining were all salvaged with open repairs, with no loss of transplant.

The impact of change appears to be substantial with a decrease in the incidence of ureteric complications from 7.7% in the initial to a more acceptable 3.8% in the present series. A further 6 (1.25%) patients had leakage from the bladder closure site which was avoided in the present series.

CONCLUSIONS

Change of technique to an extravesical stented ureteric anastomosis has significantly decreased the incidence of ureteric complications. Minimally invasive techniques were effective in salvaging 78.2% of the transplant kidneys and are recommended.

053

Trans-Atlantic telementored hand-assisted laparoscopic live donor nephrectomy

B.J. CHALLACOMBE*, S. KHAN*, R. KANDASWAMY†, A. RANE‡, P. DASGUPTA* and N. MAMODE*
**Guys Hospital and GKT School of Medicine London, UK; †Department of Surgery, University of Minnesota, Minneapolis, USA; ‡East Surrey Hospital, Redhill, UK*

INTRODUCTION

Laparoscopic live donor nephrectomy is a major advance but a challenging procedure to learn even after laparoscopic training. Telementoring has been shown to reduce the laparoscopic learning curve in other fields. Of six cases of hand-assisted laparoscopic (HAL) live donor nephrectomy at our institution, an on-site mentor supervised the initial two. We present the subsequent four cases as the first documented examples of telementored HAL live donor nephrectomy.

METHODS

Telelink was established with a Comstation (Zydacron, UK) incorporating a Z360 telementoring codec and 4 ISDN lines (512 kb/sec) with time delay of 500 ms for both audio and video. The remote surgeon in

Minnesota, USA could change independently between the laparoscopic and external views. The operating surgeons were able to look at the mentor and converse with him throughout.

RESULTS

There were no adverse events in recipients and graft function was excellent.

CONCLUSION

Our laboratory-based telerobotic experiments have been translated into clinical practice using the same computational methodology. Telementoring for laparoscopic donor nephrectomy is feasible and effective.

TABLE 1 The results of trans-Atlantic telementored hand-assisted laparoscopic live donor nephrectomy

Donor-Recipient	Operation time (min)	Warm ischaemic time (min)	Estimated blood loss (mL)	Donor morphine dose (mg)	Length of stay (days)
Son-Mother	125	2.4	28	4	2
Wife-Husband	170	3.1	287	1	3
Father-Son	296	4.1	185	5	4
Father-Son	240	2.9	185	6	3
Mean	208	3.1	171	4	3

054

Laparoscopic versus open kidney donation: one centre's experience

C.H. WILSON, A.B. BHATTI, B.J. JAQUES, D.M. MANAS, D.A. RIX and N.A. SOOMRO
The Freeman Hospital, High Heaton, Newcastle-upon-Tyne, UK

INTRODUCTION

Since July 2002 we have offered transperitoneal laparoscopic donor nephrectomy, on the background of considerable experience in general laparoscopic urology, in our department.

METHODS

All donors with a single left renal artery were assessed by the operating surgeon for the laparoscopic procedure ($n = 20$). Donors with complex left renal vascular anatomy were offered open right sided nephrectomy and formed a control group ($n = 20$).

RESULTS

At the time of writing data are available on 17 patients in each group. There have been no peri-operative deaths in either group. The early results show significant differences between the two procedures (Table 1). 53% of open donors reported wound problems at 3-month follow-up. In the laparoscopic arm, to date, no operation has been converted and there has been no reported donor morbidity at 3 months.

CONCLUSION

Although the kidney warm ischaemia time is significantly lengthened by laparoscopic removal, this does not appear to affect early graft function.

TABLE 1 Early results, median (range)

	Laparoscopic ($n = 17$)	Open ($n = 17$)	Significance (P value)
Operating time	160 min (110–190)	170 min (105–240)	0.519 (MW)
Blood loss	200 mL (100–600)	350 mL (100–1700)	0.032 (MW)
Warm ischaemia	5 min (2–7)	2 min (1–4)	[less than or equal to] 0.001 (MW)
Recipient Cr at discharge	126 μmol/L (90–268)	122 μmol/L (50–203)	0.590
Donor hospital stay	3 days (2–7)	5 days (2–10)	0.01 (MW)
Delayed graft function	6% (1/17)	6% (1/17)	NS
Ureteric complications	0	6% (1/17)	NS

055

Use of Campath-1H as induction immunosuppression in cadaveric and non-HLA identical living related donor renal transplants

A. VAIDYA, J. MILLER, G. BURKE and G. CIANCIO
University of Miami, USA

INTRODUCTION

In an attempt to reduce long-term nephrotoxic calcineurin inhibitor dosage and side-effects of steroids, Campath-1H was used as induction therapy in cadaver and non-HLA identical living related donor renal transplantation.

METHODS

Thirty-eight de novo renal allograft recipients were treated with Campath-1H (0.3 mg/kg) on day 0 and day 4 preceded by methylprednisolone 500 and 250 mg respectively. Tacrolimus levels were maintained between 5–7 ng/mL and mycophenolate mofetil (MMF) 500 mg twice daily in a steroid free protocol. There was at least 1 DR antigen donor/recipient compatibility. Primary outcome measures included delayed graft function, episode of rejection, complications, incidence of opportunistic infections, graft and patient survival after a mean follow-up of 8 months.

RESULTS

Patient and graft survival were both 100%. Biopsy-proven rejection was seen in 3 (8%) patients. One patient experienced an acute humoral rejection that was reversed with plasmapheresis and intravenous immunoglobulin. Two patients developed an infectious process that required hospitalization. The geometric mean serum creatinine concentrations at 1, 3, 6, 9 and 12 months are 1.58/1.08, 1.44/1.06, 1.48/1.13, 1.52/1.13 and 1.35/1.15 mg/dL, respectively. Three patients developed delayed graft function and one of these required dialysis. There were no side effects related with Campath-1H infusion.

CONCLUSION

Campath-1H as induction therapy allows for the avoidance of maintenance steroids. Preliminary results show a lower incidence of acute rejection. Further follow-up and larger number of patients will perhaps strengthen this concept.

056

Kidney transplantation in children: long term single centre experience

M. HAMDI, P. MOHAN, D.M. LITTLE and D.P. HICKEY
Transplantation Dept., Beaumont Hospital, Dublin, Ireland

INTRODUCTION

Kidney transplantation in children represents both technical and immunological challenge to the transplantation team. We report our long term experience in this field.

MATERIALS AND METHODS

Between 1986 and 2001, 158 kidney transplants were performed in 130 recipients (70 males and 60 females). Mean age at transplantation was 12.73 years (range 2–18 years). Causes of ESRD were pyelonephritis in 57 (36%) patients, glomerulonephritis in 46 (29%), congenital malformation and hereditary disorders each in 16 (10%) and unknown aetiology in 23 (15%). Standard surgical techniques were adopted with intraperitoneal placement of the graft in children less than 20 kg in weight. Postoperative immunosuppression protocols can be classified into three eras. Era 1 (1986–90), Cyclosporine, Immuran, and Steroids. Era 2 (1991–96) Antithymocyte-globulin (ATG), Neoral, Immuran and Steroids. Era 3 (1997–2001), Tacrolimus, Mycophenolate mophetil (MMF), and Steroids.

RESULTS

The overall patient survival is 94%. Causes of death were hyperkalaemia in 3, cardiac arrest in 2 , sepsis in 2, subarachnoid haemorrhage in 1, cerebrovascular accident in 1 and post-bone marrow transplantation in 1. Median graft survival is 7.37 years. Causes of graft failure were rejection in 44 patients, renal vein thrombosis in 8, recurrence of the original disease in 8, death with a functioning graft in 5 and haemolytic uraemic syndrome in 1. Changing our immunosuppression protocols dramatically affected our results. The 1-, 3- and 5-year graft survival were for Era 1, 56%, 46%, 42%, Era 2, 79%, 72%, 64%, Era 3, 88%, 77%, 73%, respectively.

CONCLUSION

For successful kidney transplantation in a child, meticulous surgical as well medical care is needed. Aggressive immunotherapy is a key element of success but should be balanced against the potential impact of these drugs on growth and development.

057

Transplantation of polycystic donor kidneys

H.C. GODBOLE, S. KHAN, P. DASGUPTA, J. TAYLOR and G. KOFFMAN
Guy's Hospital, London, UK

INTRODUCTION

Renal transplant is the best treatment for end stage renal disease. The discrepancy between donor organ supply and demand continues to widen and maximal efforts are in place to make use of available donor kidneys.

PATIENTS AND METHODS

Five donor kidneys with polycystic disease were transplanted in our institute. The donor kidneys were normal size to moderately enlarged (<15cm × 10cm). The donor age was 34, 46 and 55 years. All donors had a normal creatinine at the time of organ retrieval. The recipients gave an informed consent to be transplanted with the polycystic kidneys.

RESULTS

Four out of five patients had primary graft function with serum creatinine normalized 1 week post-transplantation. One patient has delayed graft function till date (8 weeks post transplant). Median follow up is 13 months (2–13).

DISCUSSION

Literature search revealed seven cases of renal transplants using polycystic donor kidneys so far. Transplanted polycystic donor kidneys may be prone to bleeding and infection and biopsies may be associated with greater morbidity. There is also the inherent risk of the polycystic disease leading onto graft failure in the recipient. Available data suggest that expected graft survival of normal sized or moderately enlarged polycystic kidneys with normal renal function can be 10 years. In our experience we have a high incidence of immediate graft function. With the acute shortage of donor kidneys, transplanting suitable polycystic kidneys in appropriate recipients is a viable option.

Wednesday 23 June 09.30–10.10
Imaging in Urology
Chairmen: B. Ellis and H. Irving

060

Three-dimensional multi-detector row computed tomography (3D MDCT) for planning of percutaneous renal stone surgery – comparison of different reconstruction methods

K.R. GHANI, U. PATEL and K.M. ANSON
St George's Hospital, London, UK

INTRODUCTION

3DCT reconstruction of the pelvi-calyceal system should help in the planning and execution of percutaneous renal stone surgery. The relative value of each reconstruction method is not known. We evaluated all techniques using the latest 16-slice MDCT scanner.

PATIENTS AND METHODS

Patients awaiting renal stone surgery were scanned using a 16-slice CT scanner (Lightspeed, General Electric, Milwaukee, USA). Prone renal scans were acquired with and without intravenous contrast, and after intravenous diuretic. Reconstruction consisted of surface rendered (SR) images, maximum intensity projection (MIP) series, volume rendered images (VRi) and rotating 360° movies (VRm). Reconstructions were rated for image quality and usefulness for pre-operative planning using a 5-point scale.

RESULTS

Stone load was best visualized on non-contrast SR images. PUJ and infundibular width were best assessed on contrast MIP. Compared to MIP, VR and SR underestimated infundibular width (mm) by 6–17% and 8–15%, respectively. Contrast VRi and VRm produced the greatest calyceal detail, and all stones were well delineated from the contrast. Compared to VR, contrast SR underestimated

the number of calyces seen by 10%. VRm was rated the most useful for planning (median score 5).

CONCLUSION

Each reconstruction method provides unique information on a particular aspect of planning for percutaneous surgery. Using volume rendering, it is possible to distinguish the stone from contrast and obtain high quality colour 3D models of the pelvi-calyceal system. Rotating 360° volume rendered movies were rated the most useful for global appreciation and planning.

061

Patients at high risk for upper tract urothelial cancer: evaluation of problem hydronephrosis using high resolution magnetic resonance urography

R. CHAHAL*, K. TAYLOR†, I. EARDLEY†, S.N. LLOYD† and J.A. SPENCER†
**York Hospital; †St James's University Hospital, Leeds, UK*

INTRODUCTION

Patients at high risk for upper tract transitional cell tumours (TCC) may have equivocal findings on IVU usually due to high-grade obstruction or renal impairment. Ureteric cannulation may be problematic due to fibrosis or with ureterointestinal anastamosis. We assessed the potential of magnetic resonance urography (MRU) in such situations.

MATERIALS AND METHODS

23 consecutive patients with unexplained hydronephrosis, who were at high risk of urothelial cancer, prospectively underwent MRU MRU comprised overview heavily T2-weighted MR urographic images followed by focussed high resolution TSE T2-weighted sequences obtained in an axial and coronal oblique plane through the level of urinary obstruction. MR findings were validated by clinical events and imaging follow up, subsequent endoscopic/surgical findings and histopathology.

RESULTS

In 23 patients with a high clinical suspicion of upper tract TCC, 8 ureteric TCCs and 5 renal pelvic TCCs (two bilateral) were diagnosed by MR and confirmed histologically. In a further 5 patients benign ureteric strictures were found. No intrinsic or extrinsic pathology was demonstrable in 5 patients. In 3 patients the hydonephrosis was related to a ureretointestinal anastomosis.5 patients were in overt renal failure.

CONCLUSIONS

MRU is a valuable non-invasive investigation for evaluating hydronephrosis in this group of patients with suspected urothelial cancer where routine imaging had failed to provide adequate detail. Focused high-resolution T2-weighted images reliably diagnosed the nature and extent of ureteric and renal pelvic cancers and were valuable in excluding these tumours as well.

062

What is required to train urology SpRs in diagnostic ultrasound?

K. THOMAS, E.A. BELLAMY, A.T. IRVINE and B.W. ELLIS
Ashford and St Peter's NHS Trust, UK

INTRODUCTION

Urology is evolving and training is undergoing reform to adapt. The new concept of the urologist as 'diagnostician' means that trainees will have to learn imaging. BAUS has now agreed that the teaching of diagnostic ultrasound skills should be part of the core curriculum. We report our experience of teaching one urological trainee basic diagnostic ultrasound (DU).

METHOD

The study involves a urological specialist registrar (SpR) and two radiologists. The SpR spent one session per week with a radiologist for a scheduled ultrasound list (phase 1).

When both felt that a satisfactory level of training had been achieved (approx 6 months), a second radiologist was asked to appraise the trainee's knowledge and skill against a draft set of standards agreed with a representative of the Royal College of Radiologists. Once deemed competent to perform DU of the urinary tract and scrotum, the trainee will undertake diagnostic ultrasound scans in clinic, supervised by a consultant urologist with ultrasound expertise.

RESULTS

After resolving some logistic problems phase 1 of training progressed well. The appraisal is scheduled for April 2004, with clinics starting in May. We will report our first experiences of clinic in clinic with preliminary recommendations for training.

CONCLUSIONS

We believe that training an SpR in DU will be feasible within a 6-month period and will enhance the trainee's diagnostic ability. Job plans will need to accommodate this new element. If urologists are to perform their own DU then training is vital to ensure an adequate level of skill.

063

What do urologists in the UK think about doing their own diagnostic ultrasound? Results of a postal questionnaire

L. TURNER, W.W. DUNSMUIR, T.A. MCNICHOLAS and B.W. ELLIS
Ashford and St Peter's Hospitals NHS Trust, UK

INTRODUCTION

In line with the evolution of urological training BAUS has agreed that the teaching of diagnostic ultrasound skills should be part of the core curriculum. The development of affordable, powerful and portable ultrasound equipment permits easy clinic and ward examinations but has led to some urologists performing their own diagnostic examinations, possibly without training.

METHOD

To assess these issues and training logistics a postal questionnaire was sent to all consultants and urological trainees in the UK; 354 (38%) responded.

RESULTS

Of consultants 25% (87/354) were already undertaking ultrasound examinations. Most had been self-taught, with the help of radiologists, ultrasonographers or fellow urologists. Few had received formal tuition or appraisal and only 17/87 (20%)had had any training update. Of trainees, 33% (31/95) were receiving some form of training, mostly in TRUS for prostate biopsy. The perceived amount of time for training was considered to be one or two sessions a fortnight. The proposal to train future urologists was supported by 87% of consultants and 93% of SpRs. Those that disapprove (9%) may be underrepresented, as enthusiasts are more likely to have responded. Many existing consultants (71%) were keen to undergo training. Concerns expressed included issues of Clinical Governance, diagnostic errors and medico-legal concerns. Inadequate clinic time, cost and maintenance of equipment, logistics for training and lack of training opportunities were frequently cited.

CONCLUSION

A sizeable proportion of British urologists have embraced the concept that the future urologist will be undertaking diagnostic ultrasound; training schemes are urgently needed.

Wednesday 23 June 15.00–16.00
Testis Cancer
Chairmen: T. Christmas and T. Oliver

085

Reduction in the size of testicular germ cell tumours 1960–2003 – trends and implications

J.M. Bhardwa, D. BERNEY, S. BAITHUN, V.H. NARGUND and R.T.D. OLIVER
Barts and The Royal London Hospitals NHS Trust, London, UK

AIM

To show that the size of testicular tumours on presentation is decreasing.

PATIENTS AND METHODS

For patients between 1960-1978 data was collected retrospectively by review of pathology reports. From 1978-2002 the details from clinical information and staging were prospectively collected in the departmental computer database and the Anglian Germ Cell Registry. The size of the tumour indicates the maximum dimension of the tumour as measured by the histopathologist in the gross specimen.

RESULTS

Shown in Table 1.

TABLE 1 The size of testicular tumour in cm since 1960–2002

Time interval	1960–1983	1984–1995	1996–1998	1999–2002
Mean tumour size stage 1	4.5	4.3	3.9	3.3
Number of patients with stage 1	54	126	59	67
Mean tumour size metastatic disease	4.8	6.1	4.1	4.5
Number of patients metastatic disease	37	36	26	5

DISCUSSION

The size of testicular tumours has shown a consistent decline over the last 4 decades. This could be due to heightened public awareness and general publicity. The increasing availability and accuracy of ultrasound has also been a major contributory factor towards testicular tumours being diagnosed early. This has implications for the management of these patients. The role of testis conserving surgery and the issues of natural conception and long term psychological morbidity are very important in this young age group that have an excellent prognosis.

086

Surveillance of testicular microlithiasis – current practice in the UK

S. RAVICHANDRAN, R. SMITH, P.A. CONFORD and M.V.P. FORDHAM
Royal Liverpool University Hospital, Liverpool, UK

INTRODUCTION

Despite an association of testicular microlithiasis with testicular tumour its aetiological role and the need for follow-up remain unclear. We conducted a national survey to provide a snapshot of current attitudes towards investigation and surveillance of patients with testicular microlithiasis.

METHODS

A questionnaire was sent to consultant BAUS members and their returns analysed.

RESULTS

Of the 464 questionnaires, 263(57%) were returned. 251 returns (12 incomplete) were analysed, of whom 173 (69%) do and 78 (31%) do not follow-up testicular microlithiasis. Of the 173 who do follow-up, 119 (69%) follow-up all patients while 54 (31%) follow-up only a selected group of patients.

172 of 173 use ultra sound scan while 27 (16%) check tumour makers. 10 (6%) arrange ultrasound scan every six months, 151 (88%) annually while 10 (6%) at longer intervals. 66

(38%) intend to follow-up these patients for life while 80 (47%) until 55 years of age and 26 (15%) for up to 5 years. 173 (68.9%) believe testicular microlithiasis is associated with CIS in <1%, 53 (21%) think it is between 1 and 10% while 7 (3%) believe it is >10%. 109 (43%) believe those patients who develop a tumour, will have survival benefit with follow-up while 142 (57%) do not.

Interestingly, 66 (38%) who follow-up these patients do not think there is a survival benefit.

CONCLUSION

There is significant variability in how patients with testicular microlithiasis are followed-up, however a majority of consultants nationally believe surveillance of this patient group confers no survival benefit. There is a clear need for evidence to clarify this issue in order to rationalize a coherent surveillance policy.

087

The impact of laparoscopy in the management of impalpable testis in adults

R. KUCHERIA*, B. CHALLACOMBE†, A. SAHAI†, T. SAMI†, A. RANE† and P. DASGUPTA‡
**Guys and St Thomas Hospital; †East Surrey Hospital; ‡Guys and St Thomas Hospital and GKT School of Medicine, UK*

OBJECTIVE

Little is reported on the management of impalpable testis in adults. We present the impact of laparoscopy in this patient group.

METHODS

Ten adult patients have been referred to our department over the last year, with impalpable testis. Pre-operative assessment was by ultrasound and MRI. Quality of life and patient satisfaction were assessed by validated SF8 and client satisfaction CS8 questionnaires. Patients were also administered a self constructed questionnaire specifically looking at the impact of a laparoscopic service on their condition.

RESULTS

The mean age was 27 years (range: 21–33). Two patients declined treatment and one with bilateral undescended testes and micropenis is undergoing genetic counselling. Ultrasound was more sensitive than MRI. Of seven patients undergoing transperitoneal laparoscopy five had intra-abdominal testes treated by laparoscopic orchidectomy (none malignant), one had the vas going into the deep ring and needed inguinal orchidectomy for an impalpable nubbin while one had a vanishing testis.

- SF8 scores for physical HRQoL were unchanged but mental score improved by 10 units;
- all patients were completely satisfied. Mean CS8 score was 30 out of 32;
- the majority indicated that the availability of a laparoscopic service had prompted them to seek medical advice.

CONCLUSIONS

Laparoscopy is the gold standard for managing impalpable testis in adults as the risk of malignancy remains till around the age of 50. Excellent patient satisfaction and quality of life are achievable. In particular mental health scores improve as previous uncertainty is removed. The advent of laparoscopy has encouraged adult patients to seek advice regarding a condition that has been present since childhood.

088

Bilateral germ cell tumours of the testis

S.S. SANDHU, A.H. NORMAN, A.C. THOMPSON, A. HORWICH, D. DEARNALEY and T.J. CHRISTMAS
The Royal Marsden Hospital, London, UK

INTRODUCTION

We aim to characterize the presentation and outcome of patients with bilateral germ cell tumours.

METHODS

The database of germ cell tumours, which contains 2995 patients was reviewed.

RESULTS

16 patients (19%) with synchronous tumours and 67 (81%) patients with metachronous tumours were identified. Five patients had a

NSGCT on one side (16%) and the remaining tumours were seminomas (84%). 35 (52%) of the patients with metachronous tumours presented with seminomas and 45 (67%) of the second tumours were seminomas. Therefore, 22 patients had bilateral seminomas (33%) and 9 (13%) had bilateral NSGCT. The mean interval to the second tumour was 7.0 (range 0.4–25.4) years and this was independent of the pathology of the first tumour. Five patients with metachronous tumours had had contralateral testicular biopsies. Three biopsies showed no evidence of tumour but these patients developed contralateral tumours at 2, 4 and 9 years after the biopsy. Intratublar germ cell neoplasia (ITGCN) was detected in the biopsies from the contra lateral testicles of two patients. One was treated with chemotherapy and the other with radiotherapy. With a mean follow up of 11.8 years, 5 deaths occurred, 4 from unrelated causes, and one from chemotherapy toxicity.

CONCLUSIONS

The incidence of bilateral testicular tumours in this series is 2.7%. With appropriate management, the prognosis of these patients is comparable to those with unilateral testicular tumours. Contra lateral testicular biopsies cannot predict the absolute fate of the remaining testicle.

089

Is the testis a sanctuary site for platinum-based chemotherapy?

S.S. SANDHU, A. KELKAR and T.J. CHRISTMAS
The Royal Marsden Hospital, London, UK

INTRODUCTION

In most men with metastatic testicular tumours the testis is removed prior to treatment with platinum-based chemotherapy. However, in some high-risk cases the testis is left in situ during chemotherapy and removed at the time of subsequent retroperitoneal lymph node dissection (RPLND). The aim of this study was to determine whether or not chemotherapy penetrates the testis as well as para-aortic lymph nodes.

PATIENTS AND METHODS

A series of 14 men underwent orchidectomy at the same time as RPLND, post chemotherapy. The histology of the testis was compared to the RPLND specimen.

RESULTS

Within the testis there was active tumour in 8 cases (seminoma 5, malignant teratoma undifferentiated 3) and differentiated teratoma in 4 cases. In only one testis was the tumour necrotic. In contrast within the RPLND specimen there was active tumour in only one case (seminoma), differentiated tumour in 9 cases and complete necrosis in 4 cases.

CONCLUSIONS

It is not advisable to leave the primary tumour in situ after chemotherapy for metastatic testicular tumours. Chemotherapy appears to be more effective against tumour within para-aortic lymph nodes than the testis. The testis should therefore be considered a relative sanctuary site offering a barrier to adequate penetration by platinum based chemotherapy.

090

Indicators of relapse in Stage 1 non-seminomatous germ cell tumours (NSGCT) of the testis: results of 20 years of surveillance

R.A. HUDDART, A.E. DRURY, T.B. HALL, D.P. DEARNALEY, A. NORMAN and A. HORWICH
The Royal Marsden Hospital, London, UK

AIM

To analyse methods of identification of relapse, in patients stage 1 NSGCT and to develop a strategy for follow-up imaging.

MATERIALS AND METHODS

We reviewed 397 patients with stage 1 NSGCT observed on a single centre surveillance programme (1979 and 1999) to identify indicators of relapse.

RESULTS

95 (24%) patients have relapsed most (80%) in year 1. Only 0.2% relapsed beyond 5 years. 72 (67%) patients were marker positive, was the relapse 'flag' in 58 (51%) and only sign of

relapse in 15. Patients who are marker negative or marker positive at diagnosis are equally likely to be marker positive at relapse. Retroperitoneal relapse occurred in 62 (56%) of cases, was marker negative in 18 (33%) and occurred after 2 years in 11 patients. Stage IIB/C relapse was commoner after 2 years and in patients treated 1979–89. No cases of pelvic relapse were identified. 29 (26%) of patients relapsed with pulmonary metastases.13 relapses were not detected on concurrent CXR. For 8 patients markers CT chest was sole indicator of relapse. 7 (1.5%) patients have died of disease or treatment toxicity (6% of relapsed patients).

CONCLUSIONS

Surveillance is an effective treatment strategy for stage I NSGCT. Clinical examination, markers and abdominal imaging are important elements. Pelvic imaging can be omitted. Omitting CT chest will lead to later presentation of 25% of patients presenting with lung metastases. Large volume abdominal relapse is commoner once CT screening is completed. Omitting the 24-month scan result in more large volume abdominal relapses.

Wednesday 23 June 16.00–17.00
BPH
Chairmen: M. Emberton and A. McNeill

094

Urodynamic classification of men with LUTS using a non-invasive pressure-flow nomogram

C.J. GRIFFITHS*, M.J. DRINNAN*, C. HARDING†, W.A. ROBSON†, R. PICKARD†, P.D. RAMSDEN†, C. BLAKE and P. ABRAMS
**Department of Medical Physics, Freeman Hospital, †Department of Urology, Freeman Hospital, Newcastle upon Tyne, UK*

INTRODUCTION

Bladder pressure during voiding can be measured non-invasively using controlled inflation of a penile cuff. Cuff pressure at interruption of flow ($p_{cuff,int}$) provides a reliable estimate of isovolumetric bladder pressure but its use for urodynamic classification has yet to be established. Here we construct and validate a diagnostic nomogram for non-invasive data.

METHOD

The line separating obstructed from equivocal and unobstructed patients on the ICS nomogram was first modified by raising its pressure axis intercept from 40 to 80 (cm H2O) to allow for the inclusion of abdominal pressure in the measurement of p(cuff,int). Next the slope of the line was increased from 2 to 4 (cm H_2O/mL/sec) reflecting the isovolumetric pressure rise occurring on interruption of voiding. For validation 143 men underwent invasive cystometry and were classified conventionally. The subjects then underwent a penile cuff pressure-flow study and their values for pcuff,int and Q_{max} were plotted on the modified nomogram.

RESULTS

The modified nomogram identified obstructed patients with sensitivity 69% (PPV 68%) and specificity 82% (NPV 81%). The addition of a flow cut off value ($Q_{max<10\ mL/sec}$) improved diagnostic accuracy for 68% of subjects who could be classified as either obstructed with sensitivity 76% (PPV 85%) or not obstructed with specificity 94% (NPV 90%).

CONCLUSION

The proposed nomogram using non-invasive pressure-flow data can accurately classify two-thirds of patients without recourse to invasive cystometry. The technique is potentially useful in the management of men with LUTS and we intend to prospectively assess its ability to predict outcome from prostatectomy.

095

Is non-invasive cystometry predictive of outcome and sensitive to change following prostatectomy

C.K. HARDING, W. ROBSON, M. DRINNAN, C. GRIFFITHS, P. RAMSDEN and R. PICKARD
Freeman Hospital, Newcastle-upon-Tyne, UK

INTRODUCTION

Conventional pressure flow studies performed prior to prostatectomy improve our ability to predict outcome for an individual but require catheterization and costly equipment. We have developed a valid and reliable non-invasive method of obtaining pressure flow data by controlled inflation of a penile cuff during voiding.

The cuff pressure required to interrupt flow (pcuff,int) gives an estimate of isovolumetric bladder pressure and can be combined with maximum flow rate (Q_{max}) to construct a diagnostic nomogram. During cuff inflation urine flow is unaffected until a distinct 'knee' pressure (pcuff,knee) is reached which equates to prostatic urethral opening pressure and may represent an additional useful parameter.

This study investigated the predictive value of the nomogram together with the responsiveness of non-invasive pressure measurements to change following prostatectomy.

METHODS

We assessed 51 men before and 4 months after TURP using IPSS, uroflowmetry and penile cuff test. Pre-operative values of pcuff,int and Q_{max} were plotted on the nomogram and compared with outcome from prostatectomy, success being defined as 50% decrease in IPSS. Values of pcuff,knee obtained before and 4 months after surgery were compared.

RESULTS

Men categorized as obstructed on the nomogram (19/51) had an improved surgical success rate of 79% compared with 69% overall. Following prostatectomy mean (SD) $p_{cuff,knee}$ fell from 107 (28) cm H_2O to 70 (27) cm H_2O ($P = 0.01$, $n = 30$).

CONCLUSION

This study suggests that non-invasive pressure flow parameters improve prediction of symptomatic outcome and are responsive to change following prostatectomy.

096

Effect of finasteride on serum cPSA level

N.N. LYNN, G.N. COLLINS, S.C. BROWN and P.H. O'REILLY
Department of Urology, Stepping Hill Hospital, Stockport, UK

INTRODUCTION

Finasteride is a commonly used drug in the management of men with BPH. It has been recognized that finasteride reduced the serum total PSA (tPSA) level as well as total prostate volume (TV) and transitional zone volume (TZV). We studied the effect of finasteride on serum cPSA levels.

PATIENTS AND METHODS

24 men with lower urinary tract symptoms were studied. Serum tPSA, cPSA, TV and TZV were measured before and 6 months after treatment with finasteride 5 mg a day. The Elecsys assay was used for tPSA measurement and Bayer Immuno 1 assay was used for the cPSA measurement. TV and TZV were measured with TRUS and TV measurement was validated in men who underwent radical retropubic prostatectomy. Wilcoxon Singed Ranks test was used to analyse the results.

RESULTS

Mean age, tPSA, cPSA, TV and TZV before treatment were 71.08 years, 7.66 ng/mL, 6.11 ng/mL, 85.1 cm^3 and 46.1 cm^3 respectively. There was significant reduction in tPSA, cPSA, TV and TZV after treatment with finasteride ($P < 0.05$). Mean reduction in serum cPSA, Serum tPSA, TV and TZV were 40%, 30%, 21% and 21% respectively.

CONCLUSION

Both tPSA and cPSA levels were effected by treatment with finasteride although the reduction in cPSA was less than reduction in tPSA.

097

Two years experience of trial without catheter in the outpatient setting

R.S. Hamm, J. SAYWER and M.C. CRUNDWELL
Royal Devon and Exeter NHS Trust, UK

INTRODUCTION

Two years ago we set up an outpatient trial without catheter (TWOC) clinic led by continence advisors. The aims were to remove the need for admission and therefore avoid cancellation of the TWOC because of lack of beds and also to allow greater continuity of care for those patients needing ongoing management in the continence department (e.g. post radical prostatectomy).

PATIENTS AND METHODS

Patients were referred by consultants or registrars from the Urology firm. On arrival a catheter specimen of urine was taken and patients were given 500 mg of ciprofloxacin orally and, after 1 h, the catheter was removed. Patients were not discharged from the department until they had voided at least twice and had a satisfactory post void residual scan. Data were collected prospectively including the underlying pathology, the outcome of the TWOC and the follow-up arrangements as well as the result of a telephone consultation the next day and any further contact with the continence department.

RESULTS

Over 100 patients have passed through the clinic with no serious complications. The majority of TWOCs took place on the planned date and less than 4% of patients required admission. Over 50% of patients had further contact with the continence advisors.

CONCLUSION

Outpatient trial without catheter has been found to be safe and has saved a significant number of inpatient bed days while giving good continuity of care to those patients who will need ongoing management by the continence department.

098

The pattern and progression of symptoms in men with persistent LUTS following prostatectomy

J. TAYLOR*, S.C.W. HARRISON*, C.W. MCGROTHER†, R.P. ASSASSA* and THE MRC INCONTINENCE STUDY TEAM†
**Mid Yorkshire Hospitals NHS Trust; †Department of Epidemiology and Public Health, University of Leicester, UK*

INTRODUCTION

The aim of this study was to establish the prevalence and pattern of urinary symptoms in men who had undergone prostatectomy, compared to that of the general population and those in the secondary care system awaiting treatment.

PATIENTS AND METHODS

A questionnaire asking for details of demographics, general health, urinary symptoms and prostatectomy status was sent to community dwelling men aged over 40, selected at random from the Leicestershire Health Authority Register.

RESULTS

8032 questionnaires were returned. 25.2% of the general population reported at least one urinary symptom, compared to 50.3% of men who have had a prostatectomy and 78.4% of men awaiting treatment for LUTS in secondary care. In men less than 70 years old, all LUTS are more prevalent in the post-prostatectomy group compared to the general population. The pattern of symptoms was the same for all groups, with voiding symptoms being commoner. There is no age-related increase in symptom prevalence in the prostatectomy group, although this is seen in the general population and pre-treatment groups. Symptom prevalence was also unaffected by time since operation. There is no difference in incontinence rates between those awaiting secondary care treatment and those who have undergone prostatectomy.

CONCLUSION

Men who have had a prostatectomy suffer from the same symptoms as those who have not. Although prostatectomy offers significant improvements in LUTS, it does not return men to the level of symptoms found in their age matched peers. However, they can expect their symptoms to remain stable over time.

099

Residual urine fraction predicts bladder outlet obstruction

N.N. LYNN, S.B. MORRIS, P. MAHESHKUMAR, R.S. JANATHAN, S.M. PHILLIPS and B.D. SARMAH
Department of Urology, Heartlands Hospital, Birmingham

INTRODUCTION

Residual urine volume (RV) and flow rate measurement are important parameters in assessing men with lower urinary tract symptoms (LUTS). Residual urine fraction (RF) has been used in some studies as an indicator of detrusor contractility. We looked at the use of residual urine volume measurement, maximal flow rate (Q_{max}) and residual urine fraction in predicting bladder outlet obstruction.

PATIENTS AND METHODS

A series of 200 men with lower urinary tract symptoms were studied. All men performed a free flow study first. he voided volume (VV) was measured. Bladder was drained with a catheter to measure RV. RF was calculated as (RV/RV+VV) X 100. A formal urodynamic study was performed afterwards and the diagnosis of bladder outlet obstruction was made by plotting the maximum flow rate (Q_{max}) against detrusor pressure at Q_{max} on Abrams-Griffiths nomograms. Mann-Whitney test was used to find the difference between obstructed and non-obstructed groups. Receiver operating characteristic curve was used to determine the diagnostic ability of Q_{max}, RV and RF in predicting bladder outlet obstruction.

RESULTS

Mean age, RV, Q*max* and RF were 62.5 years (SD = 15.11), 47 mls (SD = 89.00), 12.59 mL/s (SD = 7.7) and 17.4 % (SD = 27.3). There was statistically significant difference in Q*max* and RF between men with and without obstruction ($P < 0.05$). However, no statistically significant difference was found for RV ($P > 0.05$).Areas under the curve for Q_{max} and RF were 0.21 and 0.66.

CONCLUSION

Compared with Q_{max}, residual urine fraction gives better prediction of bladder outlet obstruction in men with lower urinary tract system.

Thursday 24 June 09.30–10.45
Renal Cancer
Chairmen: A. Dickinson and A. Doble

107

Percutaneous surgery for upper tract transitional cell carcinoma: long term follow up

S.S. SANDHU*, M.J. KELLETT†, D. DEARNALEY* and C.R.J. WOODHOUSE*
**The Royal Marsden Hospital; †The Middlesex Hospital, UK*

INTRODUCTION

Nephroureterectomy has been regarded as the standard therapy for upper tract transitional cell carcinoma (TCC). Renal pelvis TCC is a disease of the elderly, who would in some cases need dialysis after radical surgery. We have used percutaneous resection to manage this condition.

METHODS

Between 1984 and 2002, a total of 44 patients underwent percutaneous renal surgery. Follow up was available on 37 patients, with a mean age = 65 (range 37 to 92) years. Of these patients 10 had only a solitary kidney and 3 had bilateral tumours and therefore a total of 40 upper tracts were operated on.

RESULTS

The histology was as follows: benign in 5 pts, G1 pTa in 5 pts, G1 pT1in 2pts, G2 pTa in 12pts, G2 pT1 in 3pts, G3pT1 in 1pt, and G3 pT2in 2pts. Mean follow up of the patients was 4.2 years. 10 patients (31%) had a local recurrence (mean time to recurrence = 2.8 yrs). 5 patients had repeat resections; one of these and 3 other patients, including both patients with G3 disease, were managed with

nephrouretrectomy. Two patients, who would have been rendered dialysis dependent, declined nephroureterectomy and had a palliative insertion of a nephrostomy tube. Two other patients (6%) developed systemic metastasis in the absence of local pelvic recurrence.

CONCLUSIONS

Percutaneous renal surgery leads to long-term recurrence free survival in the majority of patients (62%) and in 83% of cases renal preservation. In 37% of patients in our series, percutaneous surgery prevented unnecessary reliance on renal dialysis.

108

Laparoscopic renal cryoablation % 4-year follow-up

W.A. HASAN, I.S. GILL, M. SPALIVIERO, M.M. DESAI, J.H. KAOUK and A.C. NOVICK
Cleveland Clinic Foundation, OH, USA

INTRODUCTION

Renal cryosurgery for tumor is now being offered at various institutions, however long-term oncologic follow-up data are currently lacking to date. We report our data on 40 patients undergoing LRC all of who have completed 4-year follow-up.

MATERIALS

Since September 1997, LRC has been performed in over 100 patients. Of these, 40 patients (44 tumours) have completed a follow-up of 4 years. Our postoperative follow-up protocol comprises serial MRI scans and additional CT scan-guided needle biopsy of the renal cryolesion.

RESULTS

Mean renal tumour size of 2.4 cm, mean intraoperative size of the created cryolesion was 3.7 cm. Sequential mean cryolesion size on MRI scanning at postoperative day 1, 3 months, 6 months, 1, 2, 3 and 4 years was 3.9 cm, 3 cm, 2.6 cm, 2 cm, 1.3 cm, 0.8 cm and 0.2 cm, respectively. This represents a percent reduction in cryolesion size by 23%, 33%, 49%, 67%, 80 and 95% at 3 months, 6 months, 1, 2, 3 and 4 years, respectively. At 4 years, 19 cryolesions (43%) had completely disappeared on MRI scanning. Postoperative needle biopsy identified locally persistent/recurrent renal tumour in two patients (5%). Both patients underwent secondary laparoscopic radical nephrectomy and have no evidence of disease at last follow-up.

CONCLUSIONS

In 40 patients each with a minimum of 4-year follow-up, renal cryolesions decreased in size by 95%, completely disappeared in 43%, and needle biopsy identified locally persistent/recurrent cancer in 5%. Complications were minimal. These ongoing oncologic data support the continued use of renal cryoablation in carefully selected patients.

109

Renal cryoablation in von Hippel Lindau disease

A. DOBLE, A. RIDDICK, P. HEGARTY and H. TAYLOR
Addenbrooke's NHS Trust, Cambridge, UK

INTRODUCTION

The natural history of renal tumours in von Hippel Lindau disease (VHLD) includes multiple metachronous tumours, often of low grade. Nephron-sparing surgery (NSS) achieves a 100% 5-year cancer specific survival in small renal adenocarcinomas. This pilot study assessed whether equivalent results could be achieved with in situ cryoablation therapy in VHLD patients.

PATIENTS AND METHODS

Ten VHLD patients with fourteen solid renal masses were studied. The lesions were all assessed by intraoperative ultrasound (IU/S) and needle biopsy prior to cryoablation. All

patients were treated using 3-mm cryoprobes in a double freeze technique employing Argon and Helium, at open surgery in eight and under CT guidance in two. Sensors were placed at the periphery of the lesions to monitor tissue temperatures during treatment.

RESULTS

The mean lesion size was 2.6 cm, range 2–3.1 cm and histology confirmed Fuhrman 1 or 2 renal adenocarcinoma in 9 cases and Fuhrman 3 in one. The freeze time for each cycle was 10 min. Two patients dropped their Hb by > 2.5 g d/L. The median hospital stay was 4 days, range 3–6, and median follow up 16 months, range 6–30. In all patients, CT has shown non-enhancing lesions at 6–24 months post cryoablation with a decrease in lesion volume.

CONCLUSIONS

All treated tumours were amenable to thermal injury with limited morbidity. The treated lesions were rendered avascular. This technique merits further study in a randomized controlled trial with excisional NSS to evaluate tumour control, survival and morbidity.

110

Percutaneous radiofrequency ablation (RFA) of small renal carcinoma (RCC) – medium term outcome

J.P. DYER*, B. STEDMAN†, N. LYLE†, J.E. CAST†, M.C. HAYES* and D.J. BREEN*
**Department of Urology, Southampton General Hospital; †Department of Radiology, Southampton General Hospital, UK*

INTRODUCTION

Incidental small renal cell carcinomas (RCC) are often identified in patients who are elderly and not fit for major surgery. This study aims to determine the safety and efficacy of percutaneous RFA in the management of these lesions.

METHODS AND MATERIALS

25 patients (mean age 78.2, range 60–89) underwent RFA of 29 tumours (mean 3.2, range 1.5 to 6.8 cm) between November 1999 and November 2003. Thirty treatment sessions were carried out. Treatments lasted 12 to 24 minutes and were guided by US 23, or CT 7. Patients were followed up clinically, biochemically and with early (<7 days) and sequential CT scanning.

RESULTS

Early post-procedural CT demonstrated complete tumour necrosis in 22 of 29 tumours. Five tumours required additional RFA. Two frail patients (aged 87, 88) were treated conservatively despite traces of viable tumour. Only minor complications have been identified. On case of self-limiting macroscopic haematuria and a minor asymptomatic thermal injury to the psoas muscle has occurred. No significant rise in creatinine was noted 21/25 (mean rise: 3.4 μmol/L, range -9.4 to +16.9 μmol/L). Follow up (mean 17.1 months, 427 patient months) revealed no evidence of local or distant recurrence in 22/25 patients.

CONCLUSION

Medium term experience suggests RFA is a safe, well tolerated and minimally invasive therapy for renal cell carcinoma. In the era of nephron sparing surgery, RFA may have a role in the management of small RCC.

111

Laparoscopic partial nephrectomy

P.V. KUMAR, T.H. WHITTLESTONE and M.P.J. WRIGHT
Bristol Royal Infirmary, UK

INTRODUCTION

Nineteen patients, age range 32–73 years, underwent Laparoscopic Partial Nephrectomy (LPN). Indications for surgery included six Bosniak 3 lesions and 13 solid renal lesions less than 4cm in diameter.

METHODS

Preoperative workup included spiral CT angiogram. Under anaesthetic an

ipsilateral ureteric catheter was placed. A retroperitoneal balloon dilator was then used as an approach to the affected kidney. After placement of three 10-mm ports, the pedicle is then skeletalized and after the administration of mannitol a laparoscopic bulldog is placed across the pedicle. The lesion is then resected, a biopsy frozen section taken from the tumour base and the kidney reconstructed. Baseline CT scan performed at 1 month post op.

RESULTS

TABLE 1 LPN results

Groups	Range	Mean
Operative time (min)	125–240	176
Blood loss (cc)	25–300	56
Cross clamp time (min)	25–28	31
Mean change in serum creatinine (mmol/mL)	2–40	18
Hospital stay (days)	2–5	3.1

One patient had positive frozen biopsy and required synchronous nephrectomy. One patient had negative frozen biopsy and positive margins on subsequent formal histology and underwent an interval Nephrectomy. There were transfusions or conversion to open surgery.

CONCLUSIONS

LPN is a safe alternative to open partial nephrectomy with reduced trauma to the patient. Competency in intra-corporeal suturing is a prerequisite for this procedure

112

Laparoscopic radical nephrectomy for RCC: safety, oncological effectiveness and limiting factors

A. ALHASSO*, L. MCLORNAN†, A. RAZA*, N. TOWNELL†, S.A. MCNEILL* and D.A. TOLLEY*
**Western General Hospital, †Ninewells Teaching Hospital, Dundee, UK*

INTRODUCTION

Laparoscopic radical nephrectomy (LRN) for renal cell cancer (RCC) has been demonstrated to be safe and associated with long term outcomes similar to open nephrectomy (ON) for T1 RCC. The application of the approach to patients with more advanced disease requires further evaluation. We report our experience in LRN and discuss safety, oncological effectiveness and limitations of the procedure.

METHODS

Retrospective review of case notes for all patients undergoing LRN for RCC in two institutions.

RESULTS

Sixty-one patients (mean age 62 years, range 21–83) have undergone LRN.Pre-operative CT stage was T1a in 29 patients, T1b in 25 and T2 in 6. Operating time was 143.75, 145.26 and 161.83 min for T1a, T1b and T2 respectively ($P = 0.001$ Student's *t*-test). Pathological staging resulted in upstaging of two cases from T1a to pT3b, 4 cases from T1b to pT3b and 2 from T2 to pT3b. There were no major surgical complications and 8/61 (13%) suffered post-operative complications. Four cases (2.4%) required blood transfusion, and the median postoperative stay was 4 days (range 2–56).

All specimens were removed intact and no positive surgical margins were reported. No recurrences have been reported in 37 patients with a mean follow-up of 36 months.

CONCLUSIONS

LRN for T1 RCC is a safe procedure. Negative surgical margins achieved in all cases provide encouraging evidence of satisfactory oncological effectiveness. In our T2 RCC group the operating time was significantly longer, suggesting that tumour size will be one of the main limiting factors for this approach.

113

Nephrectomy for renal cell carcinoma with nodal metastases – is it worthwhile

A. KELKAR, S. SANDHU, M. GORE, T. EISEN and T.J. CHRISTMAS
The Royal Marsden Hospital, London, UK

INTRODUCTION

Metastatic renal cell carcinoma (RCC) is generally considered to have a poor prognosis but recent studies suggest that it is best to remove the primary before commencing immunotherapy. The aim of this study was to examine the prognosis of patients with lymph node metastases who underwent lymphadenectomy at the time of radical nephrectomy.

PATIENTS AND METHODS

A series of 275 RCC cases underwent radical nephrectomy with enbloc lymphadenectomy between 1992 and 2003. Lymph node metastases were present in 45(16%). Metastases were present in just the nodes in 19 but in the nodes and elsewhere in 26. Immunotherapy was only given to those with identifiable metastases.

RESULTS

13 (68%) of those with isolated nodal metastases are alive and those that are dead survived for a median of 24 months. In contrast, those with nodal and other metastases only 6 (23%) are alive. Of those that died, their median survival was only 5 months.

CONCLUSIONS

Lymphadenectomy at the time of radical nephrectomy for RCC appears worthwhile with surprising good survival results when metastases are present. Patients with metastases elsewhere do much worse after lymphadenectomy often with only short-time survival.

114

Trans-abdominal approach to resection of vena caval thrombus from a renal cell carcinoma. Surgical pitfalls and their management

A. VAIDYA, G. CIANCIO and M. SOLOWAY
University of Miami, USA

INTRODUCTION

Patients with a renal tumor that extends into the vena cava (IVC) is often a challenge to the surgeon. The degree of difficulty depends upon the location of the thrombus in relation to the liver i.e. infra, retro or supra hepatic. The purpose of this abstract is to identify crucial steps where potential mishaps could take place, how to avoid them and if committed, to effectively manage them.

PATIENTS AND METHODS

From January 1999 to November 2003, 91 patients underwent resection of a caval thrombus using a transabdominal incision and piggyback technique of liver mobilization. Anatomico-surgical site-specific problems were identified and described.

RESULTS

Eleven patients had a thrombus extending into the atrium. Of these, cardio-pulmonary bypass was instituted in 6. Eighty-five patients underwent resection of the IVC thrombus without recourse to any form of bypass. Surgical site-specific areas of potential mishaps included the following: (a) Placement of the Rochard retractor could cause splenic or liver capsular tears. (b) Detaching the liver from its peritoneal attachments could lead to liver, diaphragmatic, adrenal, major hepatic vein, inferior phrenic vein, spleen and stomach injuries. (c) The piggyback technique of liver mobilization could result in tears in the IVC and the under surface of the IVC from 'ripping off' of the minor hepatic veins (d) Exposure and vascular isolation of the IVC could lead to thrombus displacement, tears in the lumbar veins and injury to the contralateral renal vein. (e) Removal of the thrombus after cavotomy could lead to tumor and air embolus. (f) Bypass could lead to problems from catheter placement and pump issues.

CONCLUSIONS

Excellent exposure of the IVC is the key to a trans-abdominal approach to these tumours. Understanding the potential areas of disaster will help urologists undertake this procedure with confidence.

Tuesday 22 June 09.30–10.30
Poster Session 1: Basic Science Oncology – Prostate
Chairmen: H. Leung and R. Persad

P001

Keratinocyte growth factor (KGF) and androgen down-regulate beta-1 integrin expression and induces differentiation in human prostatic epithelial stem cells

R. HEER, A.T. COLLINS and H.Y. LEUNG
Urology Research Group, Northern Institute for Cancer Research, University of Newcastle, Newcastle upon Tyne, UK

INTRODUCTION

Understanding stem cell regulation may provide useful insight into the pathogenesis prostate cancer. It is thought that integrins play an important role in maintaining cells within stem cell compartment. We investigated the effect of blocking of the β_1 integrin function on prostate epithelial stem cells in addition KGF and androgen, which are essential in prostate development.

METHODS

Benign tissue from resected prostate samples was used to select stem cells (Collins *et al.*, *J Cell Sci* 2001; **114**: 3865–72) which were either incubated with a blocking anti-beta 1 integrin antibody, or treated with KGF (10 ng/mL) or androgen analogue R1881 (10 nM). Differentiation was characterized by expression of prostate acid phosphatase (PAP), androgen receptor (AR) and cytokeratin18 (CK18) using immunofluorescence and FACS analysis. Expression of $\alpha_s\beta_1$ integrin was also examined.

RESULTS

Blocking β_1 integrin resulted in up-regulation of PAP and CK18 (60% and 3% respectively, $P < 0.001$) and no increase in AR levels. Treatment with KGF resulted in the down regulation of $\alpha_2\beta_1$ integrin (61% decrease, $P < 0.001$) and increases in PAP, CK18 and AR (35%, 36% and 39% increases respectively, $P < 0.001$). R1881 treatment also resulted in the down regulation of $\alpha_2\beta_1$ integrin (60% decrease, $P < 0.001$) with concurrent increases in PAP, CK18, AR (33%, 36% and 34% respectively, $P < 0.001$). These effects of KGF and R1881 markers of differentiation were specifically inhibited using SB 202190 (5 uM) and casodex (10 uM) ($P < 0.05$).

CONCLUSIONS

Specifically blocking the beta1 integrin, induces exit from the prostate epithelial stem cell compartment as determined by the expression of PAP and CK18. KGF and androgen act to down regulate $\alpha_2\beta_1$ integrin causing differentiation with the additional effect of inducing AR expression.

P002

Fibroblast growth factor 17 is upregulated in human prostate cancer

R. HEER*, D. DOUGLAS*, M.E. MATHERS†, C.N. ROBSON† and H.Y. LEUNG†
**Basic Science Oncology, Northern Institute for Cancer Research, University of Newcastle upon Tyne, †Department of Cellular Pathology, RVI, Newcastle upon Tyne, UK*

INTRODUCTION

Over-expression of fibroblast growth factor-8 (FGF8) in human prostate cancer is associated with clinically aggressive disease. Among different members of the FGF family, FGF17 and FGF8 share a hig H sequence homology. They share similar patterns of expression during embryogenesis where FGF8 has been shown to induce FGF17 expression. We tested the clinical significance of FGF17 expression and its *in vitro* function in prostate cancer cells.

METHODS

We studied 40 resected prostate specimens, using semi-quantitative RT-PCR, from patients with benign prostatic hyperplasia (BPH, $n = 12$) and prostate cancer (CaP, $n = 28$; Gleason sum scores 3–10). In addition, 85 CaP (Gleason sum scores 5–9) were examined using immunohistochemistry for FGF17 expression and findings were correlated with clinical parameters. Prostate cancer cell lines (LNCaP, DU145 and PC3M) were examined for FGF17 expression by Western analysis following rFGF8 treatment.

RESULTS

Semi-quantative RT-PCR analysis for mRNA expression demonstrated a 4-fold up-regulation of FGF17 expression in high grade CaP (Gleason sum score 7–10) when compared to BPH ($P < 0.0001$). Both immunohistochemistry and RT-PCR revealed a significant linear correlation between increasing Gleason sum score and FGF17 expression, at both mRNA and protein levels ($P < 0.0001$, Rho = 0.99). Survival analysis showed that men with tumours displaying high levels of FGF17 expression had a worse outcome ($P = 0.044$) and was associated with the presence of metastases ($P < 0.0001$). Furthermore, we demonstrated FGF8 mediated induction of FGF17 in LNCaP, DU145 and PC3M.

CONCLUSIONS

Our data supports a role for FGF17 in human prostate carcinogenesis and has revealed evidence for the contrOl of FGF17 expression by FGF8.

P003

Gene expression profiling of epithelial and stromal cell lines derived from malignant prostates and cells captured by laser microdissection from fresh frozen prostate tissues as a means of localization of candidate proteases and their related genes

C.J. SHUKLA*, A.C.P. RIDDICK*, A. COLLINS†, R.Y. BALL*, K.K. SETHIA‡ and D.R.W. EDWARDS§
**Norfolk and Norwich University Hospital NHS Trust, †York Cancer Research Unit, ‡Norfolk and Norwich University Hospital, §University of East Anglia, UK*

INTRODUCTION

Our previous work using quantitative real-time RT-PCR of protease genes on fresh frozen prostate tissue had identified potential candidate markers and treatment targets in prostate cancer progression. These include members of the Matrix Metalloproteinase (MMP) and serine protease families and their inhibitors. Knowledge of the cellular localization of these genes is imperative to understand their roles in prostate tumourigenesis.

METHOD

Malignant areas of prostate cancer from different patients were cultured in selective media to promote the specific growth of epithelial or stromal cells and their RNA extracted. Fresh frozen sections of tissues from the tissue bank have been subjected to laser microdissection and the RNA extracted. The RNA was reverse transcribed and the cDNA subjected to TaqMan® RT-PCR for the candidate genes.

RESULTS

Taqman® RT-PCR from the epithelial and stromal cell lines has shown the significant and predominantly epithelial expression of MMPs 10, 25, Hepsin, Matriptase 1 and Maspin, whereas TIMPs 3 and 4, RECK, MMPs 2, 23, UPAR and PAI-1 were predominantly stromally expressed. To date some of these genes have been profiled in cell populations captured by LCM, which corroborates that of cell culture studies.

DISCUSSION

We have demonstrated the cellular localization of candidate protease genes at mRNA level using epithelial and stromal cell lines and cells captured by laser microdissection. Further work entails completing the comprehensive gene analysis on the laser microdissected tissues and ultimately the correlation with clinicopathological features in an adequately powered study to determine the robustness of these genes as markers.

P004

Association of CYP1b1 Val432Leu polymorphism and prostate cancer risk

A.R. AZZOUZI*, J.W.F. CATTO*, I. REHMAN*, M. MEUTH†, O. CUSSENOT‡ and F.C. HAMDY‡
**Academic Urology Unit, University of Sheffield, †Institute for Cancer Studies, University of Sheffield, ‡Department of Urology, Hopital Tenon, Paris, France*

INTRODUCTION

Cytochrome P450 1B1 catalyses the conversion of 17-β-estradiol (E2) to the catechol estrogen metabolites 2-OH-E2 and 4-OH-E2 that have been postulated to be involved in the carcinogenesis of different cancers. Variants of the CYP1B1 gene modulate the risk for developing ovarian, lung and breast cancer. The aim of this study was to determine whether the common V432L polymorphism of the

CYP1B1 gene was related to prostate cancer risk.

PATIENTS AND METHODS

Using a nested case control design, we genotyped 222 patients with prostate cancer and 157 healthy male controls from a large epidemiological cohort. The polymorphism in exon 3 of the CYP1B1 gene at nucleotide position 1666 that changes leucine 432 to valine was analysed by 5' nuclease PCR. analysis was used to test the V432L polymorphism for differences in genotypic and allelic frequencies between prostate cancer cases and controls. Relative risk associated with a particular genotype or allele was estimated by calculating odds ratio (ORs) along with 95% confidence intervals (CI).

RESULTS

The distribution of alleles Val and Leu was significantly different between the prostate cancer group and the controls ($P = 0.05$). In addition, the presence of the Val432 (genotype Val/Val and Val/Leu vs Leu/Leu) was associated to the prostate cancer risk (OR = 1.6, 95% IC = 1.1-2.1, $P = 0.035$).

CONCLUSION

These results confer to the V allele a dominant effect that is coherent with its known high catalytic activity in producing more carcinogens. Thus inherited alterations in CYP1B1 hydroxylation activity may explain inter-individual differences in prostate cancer risk associated with estrogen-mediated carcinogenesis.

P005

Epigenetically repressed VDR target genes in prostate cancer represent a novel therapeutic target

L.M. GOMMERSALL*, F. KHANIM†, D. PHEEL‡, N. JAMES†, A.P. DOHERTY* and M.J. CAMPBELL†
**University Hospital Birmingham, †University of Birmingham Medical School, ‡Stanford University School of Medicine*

INTRODUCTION

We hypothesized that in prostate cancer epigenetic mechanisms associated with altered co-repressor expression/activity repress the antiproliferative actions of nuclear receptor (NR) agonists resulting in tumour resistance to ligands such as $1\alpha,25(OH)_2D_3$.

METHODS

Malignant prostatic epithelial tissue from cell lines and primary culture was analysed using proliferation, apoptosis, RT-PCR techniques and microarray technology.

RESULTS

Real time RT-PCR demonstrated elevated NR co-repressor (SMRT, NCoR1 and Alien) mRNA in prostate cancer cell lines. Similarly 10/15 primary tumour samples had elevated SMRT mRNA levels (mean 4.2-fold increase); generally NCoR1 and Alien were not as commonly elevated. Furthermore in 4 out of 5 matched tumour and normal pairs we also found elevated co-repressor mRNA levels. $1\alpha,25(OH)_2D_3$ sensitivity can be restored by treatment with histone deacetylation inhibitors, such as trichostatin A (TSA), to induce apoptosis. cDNA microarray analyses identified a group of genes including GADD45α and MAPK-APK2 that were modulated by $1\alpha,25(OH)_2D_3$ plus TSA. For example, GADD45 α mRNA and protein were only significantly upregulated by co-treatment, but not with either agent alone. Subsequently we have knocked-down SMRT levels in PC-3 cells using small interfering RNA, which resulted in a 95% reduction in the basal levels of SMRT mRNA after 72 h, and found that GADD45 α induction by $1\alpha,25(OH)_2D_3$ alone became very significantly enhanced. Supportively induction of GADD45 α by $1\alpha,25(OH)_2D_3$ was repressed in primary tumour cultures relative to matched normal controls.

CONCLUSIONS

These data are a consistent model of promoter-specific epigenetic silencing and may represent a novel therapeutic for prostate cancer.

P006

Silencing of the type 1 insulin-like growth factor receptor (IGF1R) gene by RNA interference enhances sensitivity of prostate cancer to DNA damaging agents

M.A. ROCHESTER*, G.O. HELLAWELL*, S.F. BREWSTER† and V.M. MACAULAY*
**Weatherall Institute of Molecular Medicine, Oxford, †Churchill Hospital, Oxford, UK*

INTRODUCTION

The IGF1R is overexpressed in prostate cancer. We recently described small interfering RNAs (siRNAs) that cause profound IGF1R gene silencing and impaired survival of prostate cancer cells *in vitro*.

Since IGF signalling enhances apoptosis protection it follows that siRNA treatment may sensitize this notoriously chemoresistant tumour to cytotoxic drugs, many of which act through apoptosis induction.

MATERIALS AND METHODS

We transfected IGF1R siRNAs or controls into three prostate cancer cell lines: DU145, PC3 and LNCaP. Cells were treated with drugs for 24 h. We measured IGF1R levels by immunoblotting and survival by clonogenic assays. Response to double-strand (ds) DNA breaks induced by irradiation was assessed by pulsed-field gel electrophoresis (PFGE), and cell cycle distribution by flow cytometry (FACS).

RESULTS

Transfection with siRNAs inhibited IGF1R expression to 15–20% of control. These agents enhanced sensitivity to etoposide, mitoxantrone, nitrogen mustard and irradiation, with reduction in IC50 values in both DU145 and PC3 by factors of 1.5–2.5. There was no sensitization to paclitaxel or 5-fluorouracil. Pulsed field gel electrophoresis analysis suggested accumulation of DNA fragments less than 200 kb following IGF1R silencing and irradiation, and FACS analysis of these same cells showed G2 arrest.

CONCLUSION

IGF1R silencing by siRNA enhanced sensitivity to DNA damaging agents. The altered response to dsDNA breaks and G2 arrest after IGF1R silencing are consistent with a connection between IGF1R and Atm and a role for IGF signalling in the DNA damage response. These results support the concept of IGF1R targeting as novel therapy for advanced prostate cancer.

P007

The expression and possible retrotransposition of HERV-K in prostate cancer

R.D. SMITH*, B. KHOUBEHI*, J. BEATTY†, M.A. PENNY‡ and C.W. OGDEN§
**St Mary's Hospital, Paddington; †Wexham Park Hospital, Slough; ‡Imperial College of Science, Technology and Medicine; §Chelsea and Westminster Hospital, UK*

INTRODUCTION

Human endogenous retroviruses (HERVs) are generally 'silenced' from expression and therefore represent 'genetic fossils' of the ancient retroviruses from which they are derived. HERV expression has been reported in seminoma, colon, breast cancer and recently in prostate cancer. They have a theoretical role in carcinogenesis by retrotransposition where reinsertion of expressed sequences disrupts the function of normal cellular genes.

MATERIALS AND METHODS

HERV-K expression was evaluated in 5 prostate cell lines (DU145, PC3, LNCaP, PNT1A and PNT2), 22 benign and 33 malignant specimens by RT-PCR and confirmed by Southern hybridization and DNA sequencing. HERV-K restriction fragment patterns in genomic DNA from 23 benign and 20 malignant prostate specimens were compared with 40 control DNA samples.

RESULTS

HERV-K envelope expression was detected in all of the cell lines, 21/33 prostate cancer specimens (63%) and 11/22 BPH specimens (50%) ($P = 0.39$, two-tailed Fisher's exact test). Some unique HERV-K restriction fragment patterns have been identified in the cell lines and prostate cancer specimens that were not present in controls or benign specimens.

CONCLUSION

HERV-K expression occurs in prostate cancer but not significantly more frequently than in BPH, suggesting expression in hyperplastic as well as in malignant cells. This contrasts with HERV-E mRNA expression in the prostate which has been reported only to occur in malignant tissue. Differences in the restriction fragment patterns could be due to expressed HERVs acting as mobile elements that may contribute to the genetic instability that is generally associated with carcinogenesis by affecting the function of normal cellular genes.

P008

Chemoprevention of androgen-induced oxidative DNA damage by flutamide in human prostate cancer cells

S.K. PATHAK, R.A. SHARMA, R. SINGH, A.J. STEWARD, W.P. GESCHER and J.K. MELLON
University of Leicester

INTRODUCTION

Reactive oxygen species (ROS) are pathological factors in the development and progression of prostate cancer. ROS causes peroxidation of lipids and oxidative DNA damage, resulting in the formation of DNA adducts such as 8-oxo-deoxyguanosine (8-oxo-dG) and the pyrimidopurinone adduct of deoxyguanosine (M1G), both associated with carcinogenesis. It has been shown that dihydrotestosterone (DHT) increases ROS in LNCaP human prostate cancer cells. We determined the influence of DHT on oxidative DNA adducts levels in prostate cancer cell lines and assessed whether flutamide prevented DHT-induced changes.

METHODS

LNCaP (androgen-sensitive) were grown in vitro and were treated with DHT (2.5, 10, 25, 50 and 100 nM) daily for 7 days. M1G and 8-oxo-dG adduct levels in extracted DNA were determined by immunoslot blot and liquid chromatography-tandem mass spectrometry respectively. The effect of flutamide on M1G levels following DHT treatment was also studied.

RESULTS

M1G and 8-oxo-dG levels were significantly increased in LNCaP cells at DHT concentrations >= 2.5 nM. Flutamide prevented the increase in M1G levels induced by 2.5 nM and 100 nM DHT ($P < 0.05$).

CONCLUSION

The changes in oxidative DNA adduct levels in LNCaP cells treated with DHT and flutamide suggest that androgens increase oxidative DNA damage in androgen-sensitive prostate cells, and that this response can be pharmacologically prevented. The use of in vivo models need to explore the role of such DNA adducts, and thus may serve as biomarkers of efficacy in chemoprevention trials of anti-androgens.

P009

The effects of Zoledronic Acid on PC3 cell tumour growth in the bone

K.D. LINTON, C.L. EATON, P.I. CROUCHER, N.J. BROWN and F.C. HAMDY
Academic Urology Unit, University of Sheffield, UK

INTRODUCTION

The most frequent morbidity associated with advanced prostate carcinoma is that of bony metastasis. These metastases are mixed but predominantly osteoblastic, although it is thought this is preceded by osteolysis. Bisphosphonates inhibit bone resorption by promoting apoptosis in osteoclasts. They have been shown to have analgesic effects in patients with metastatic skeletal pain and decrease skeletal related events in metastatic prostate cancer. The aim of this study is to evaluate the effects of Zoledronic Acid on an *in vivo* model of this initial osteolytic lesion.

METHODS

Male CD1 Nude mice were inoculated with PC3 cells directly into the right tibia. Mice received Zoledronic Acid subcutaneous 5 μg twice weekly for 6 weeks or phosphate buffered saline as control. After death the tumour bearing limb, long bones and spine were harvested. Total bone mineral density was measured by dual-energy X-ray absorptiometry. Bones were X-rayed and lytic lesions were measured. Bones were embedded and 3 micrometer sections cut, bone histomorphometry performed and cancellous bone volumes calculated.

RESULTS

PC3 cell tumours induce lytic lesions in the tumour-bearing limb of control animals ($P < 0.05$). PC3 tumours decrease cancellous bone ($P < 0.05$) and bone mineral density. Zoledronic Acid prevented lytic lesions in bone ($P < 0.05$), prevented cancellous bone destruction by PC3 cell tumours ($P < 0.05$) and increased bone mineral density.

CONCLUSIONS

PC3 cell tumours in tibias of male Nude mice produce bone disease characterized by the formation of lytic lesions, decreased bone mineral density and a decrease in cancellous bone. These affects were prevented by administration of Zoledronic Acid.

P010

Differential modulation of cellular migration in prostate cancer by the IGF-axis – implications for metastatic spread

B.J.R. BARRASS, C.M. PERKS, T. LAI, J.M. HOLLY and R.A. PERSAD
University of Bristol, UK

INTRODUCTION

Insulin-like growth factors (IGFs) and their six binding proteins (IGFBPs 1-6) are known to modulate cellular migration. Migration is important for metastatic spread and may be a mechanism by which IGFs modulate cancer risk. We demonstrate IGF-I, IGFBP-3 and IGFBP-5 to modulate the migration of androgen resistant prostate cancer cells.

MATERIALS AND METHODS

Androgen resistant DU145 and PC-3 prostate cancer cells were treated with increasing doses of IGF-I (0.1–100 ng/mL). DU145 cells were also treated with increasing doses of IGFBP-3, SPD (non-IGF binding IGFBP-3) and IGFBP-5. Cell migration on extra-cellular matrix (ECM) was measured after 18 hours using the agarose drop technique.

RESULT

IGF-I resulted in a dose-dependent increase and decrease in PC-3 cell migration of up to 477% ($P = 0.05$) and 70.2% ($P = 0.00005$) respectively. IGFBP-3, SPD and IGFBP-5 all inhibited DU145 cell migration on ECM in a dose dependent manner by up to 80% ($P = 0.0003$), 91% ($P = 0.0001$) and 70% ($P = 0.0003$) respectively.

CONCLUSION

Serum IGF-I has been positively associated with advanced prostate cancer. These observations suggest IGF-induced migration may partly account for this association. IGF-I induced migration in PC-3 cells, but not the less invasive DU145 cells, suggesting this response may be acquired with tumour progression. Serum IGFBP-3 has been negatively associated with advanced prostate cancer. These findings suggest inhibition of cell migration by IGFBPs may underlie the association. SPD cannot bind IGFs but had the same effect as intact IGFBP-3, suggesting IGFBP-3 acted directly. Greater understanding of how the IGF-axis modulates cell migration may yield novel anti-metastatic treatments.

P011

Differential modulation of adhesion and apoptosis by insulin-like growth factor binding protein-3 in a model of androgen resistant prostate cancer

B.J.R. BARRASS, C.M. PERKS, J. CARTER, T. LAI, J.M. HOLLY and R. PERSAD
University of Bristol, UK

INTRODUCTION

Serum insulin-like growth factor binding protein-3 (IGFBP-3) has been negatively associated with epithelial cancer risk, possibly by enhancing apoptosis. Here we demonstrate IGFBP-3 directly enhances apoptosis and cell detachment from an integrin matrix in a model of androgen resistant prostate cancer.

MATERIALS AND METHODS

Androgen resistant prostate cancer cells (DU145) were pre-treated with IGFBP-3 (200 ng/mL) or an equivalent dose of SPD (non-IGF binding IGFBP-3) for 24 hours followed by an apoptotic dose of ceramide or paclitaxol for 48 h. Cell death was measured using cell counts and western immunoblotting for cleaved PARP (p85). Cellular attachment to an extra-cellular matrix (ECM) following treatment with the same dose of IGFBP-3 and SPD was recorded using a standard cell attachment assay.

RESULT

IGFBP-3 significantly increased Taxol (by 38.7% $P = 0.00009$) and ceramide (by 24% $P = 0.04$) induced apoptosis whereas SPD significantly increased and reduced Taxol (by 39.7% $P = 0.002$) and ceramide (by 64.5% $P = 0.0002$) induced apoptosis respectively. IGFBP-3 and SPD resulted in a significant and dose-dependent increase detachment from ECM of up to 43% ($P = 0.05$) and 32% ($P = 0.003$) respectively.

CONCLUSION

These results suggest apoptosis and cellular detachment may be a mechanism by which IGFBP-3 modulates prostate cancer risk but the apoptotic effect of IGFBP-3 depends on the apoptotic trigger and whether it is acting directly (SPD cannot bind IGFs and therefore acts directly). The effect of IGFBP-3 on adhesion is consistent with reports indicating IGFBPs may signal through integrin associated pathways. Greater understanding of these differential effects of IGFBP-3 may yield novel therapeutic strategies.

Tuesday 22 June 11.00–12.00
Poster Session 2: Lower Tract Functional Abnormalities
Chairmen: P. Abrams and A. Thorpe

P012

Nocturnal polyuria is associated with higher levels of pro-brain natriuretic polypeptide

E.R. MACDONALD, P.W. KURTARSKI and D. RITTOO
Arrowe Park Hospital, Manchester, UK

INTRODUCTION

Patients with nocturnal polyuria have higher levels of atrial natriuretic peptide (ANP) than controls, which suggests sub-clinical cardiac failure may be involved in the cause of nocturnal polyuria. We decided to investigate whether the same link would be found with pro brain natriuretic polypeptide (pro-BNP) a newer and more reliable test for excluding cardiac failure.

METHOD

All new male patients attending as new patients to our LUTS clinic were invited to complete a 3-day frequency volume chart. Cases who suffered with nocturnal polyuria were defined as those with a nocturnal urinary volume greater than 33% of their total 24-h output; controls were defined as those with a nocturnal urinary volume less than 25% of their total 24-h output. Twenty-two cases and 12 controls were recruited, all had pro-BNP levels measured (Roche-negative predictive value of 97% for heart failure if less than 100ng/L), an ECG and echocardiogram.

RESULTS

Pro-BNP levels were higher in patients with nocturnal polyuria. Median BNP level for the cases was 112.40ng/L and for the controls was 41.65ng/l. This difference was close to statistical significance, $P = 0.056$ (Mann–Whitney *U*-test).

CONCLUSIONS

Patients with nocturnal polyuria appear to have higher levels of pro-BNP. This adds weight to the hypothesis that sub-clinical cardiac failure is in some part causative in the patho-physiology of nocturnal polyuria. Pro-BNP measurement may be a useful test for the urologist to investigate nocturnal polyuria.

P013

The stomal complications associated with ileal conduit formation in women with intractable urinary incontinence

D.N. WOOD, S.E. ALLEN, T.J. GREENWELL and P.J.R. SHAH
Instutute of Urology, UCL, London, UK

INTRODUCTION

There are few reports about stomal problems after an ileal conduit for intractable urinary incontinence in females. We have reviewed the long-term stomal complications of patients having ileal conduit formation with particular emphasis on this neglected group.

PATIENTS AND METHODS

The notes of 93 consecutive patients having an ileal conduit performed were reviewed. Information was collected on patient demographics, indications and long-term stomal complications. Mean follow-up available was 63.4 months (range 1–434).

RESULTS

Thirty-three males mean age 60.1 years and 60 females mean age 48.2 years were included. The main indications for ileal conduit were; intractable incontinence 31 (45%), cancer 27 (39%) and interstitial cystitis 6 (9%).

Complication	Indication for ileal conduit N (%) Males	Continent females	Incontinent females
Parastomal hernia	3 (10%)	2 (10%)	12 (31%)*
Stomal retraction	0 (0%)	1 (5%)	12 (31%)*
Stomal stenosis	0 (0%)	1 (3%)	6 (15%)
Stomal bleeding	0 (0%)	0 (0%)	3 (8%)
Redundant loop	0 (0%)	2 (10%)	5 (13%)
Reoperation	1 (3%)	5 (24%)	17 (44%)*
>1 Reoperation	1 (3%)	3 (14%)	9 (23%)

TABLE 1
Stomal complications

** = P < 0.05*

CONCLUSIONS

The ileal conduit is associated with an overall stomal complication rate of 34.4 % (61% in incontinent females and 18 % in other patients). Reoperation is required for these stomal complications in 24.7 %. Stomal complication rates and reoperation rates vary by sex and indication for ileal conduit – and are significantly higher for those performed for intractable urinary incontinence in females.

P014

Evolving urethroplasty options for bulbar urethral stricture – a current rationale for procedure selection

S.A. SHAH
I.K.D.R.C., Ahmedabad, India

OBJECTIVE

To evolve urethroplasty options in bulbar urethral stricture of various aetiology.

MATERIALS AND METHODS

164 patients (age 8–84 years) having bulbar urethral strictures treated from 1997 to 2003 were selected for the study. All patients had some intervention earlier except 11 who had traumatic strictures. All patients were evaluated by EUA.

Seventy-one patients underwent anastomotic urethroplasty (stricture length 2 cm). Augmented roof top urethroplasty using buccal mucosa performed in 40 patients (stricture >2 cm) and of 17 patients (stricture >1.5 cm). 13 patients underwent dorsal onlay buccal mucosal urethroplasty. 19 had prepucial pedicle flap urethroplasty. Staged urethroplasty performed in 4 patients who had associated abscess or fistula.

RESULT

After Anastomotic urethroplasty, 11% developed restricture with stricture length up to 2 cm. One patient required needed optical urethrotomy after augmented roof top urethroplasty and rests are having excellent result with 1–5-year follow up. 2 patients (out of 13) who underwent dorsal onlay buccal mucosal graft developed restricture. Out of 19 pedicled graft 3 had small diverticuli and 1 had anastomotic stricture. 4 who underwent staged urethroplasty had initial good results & only one turned up for 2nd stage.

CONCLUSION

An algorithm for bulbar urethral stricture urethroplasty could be as below.

- Up to 1–1.5 cm: Anastomotic Urethroplasty
- >1.5–3 cm: Buccal mucosa augmented roof top
- Penile Bulblar: Dorsal Onlay (One stage urethroplasty)
- (PAN Urethral)
- Absence of plat: Pedicle Urethroplasty
- Fistula + Scar + Infection: Staged urethroplasty

P015

The pill and urinary stress incontinence, evidence from a Cochrane Review

A. ALHASSO*, C.M.A. GLAZENER†, R. PICKARD‡ and J. N'DOW§,
**Western General Hospital, †University of Aberdeen, ‡Freeman Hospital, §Aberdeen Royal Infirmary, UK*

INTRODUCTION

Medical therapy with adrenergic agonists for stress urinary incontinence is generally ineffective with significant side effects. Nevertheless, there is continuing clinical and pharmacological interest in their use. We therefore carried out a systematic review and a meta-analysis of the available randomized clinical trials to evaluate the clinical evidence for their use.

METHODS

We searched the Cochrane Incontinence Group trials register and the reference lists of relevant articles. Selection criteria include all randomized or quasi-randomized controlled trials which include an adrenergic agonist in at least one arm, for adults with urinary incontinence. Two reviewers independently assessed eligibility, trial quality and extracted data. Data were processed as described in the Cochrane Collaboration Handbook.

RESULTS

Fifteen randomized trials were identified, which included 832 women, of whom 506 received an adrenergic drug. No trials included men. The limited evidence suggested that an adrenergic agonist was better than placebo (cure/improvement rates for phenylpropanolamine, RR 1.58, 95% CI 0.87 to 2.85; for Midodrine 1.55, 95% CI 1.02 to 2.35; for Clenbuterol 1.96, 95% CI 1.26 to 3.05). Two trials suggested that adrenergic agonists are better than pelvic floor muscle training for subjective cure/improvement (RR 1.41, 95% CI 1.09 to 1.81).

CONCLUSION

There is weak evidence in support of adrenergic agonists as effective treatment for incontinence over placebo, but not enough evidence to assess their effectiveness in relation to other treatments. Minor side effects did not reach statistical significance. However, larger trials with standardized outcomes and trials for men with post-prostatectomy stress incontinence will strengthen the evidence.

P016

Does urinary sodium affect bladder sensation in patients with an overactive bladder?

F. LEE, J. SUSSER, A.R. MUNDY, P.J.D. FOXALL and M.D. CRAGGS
Institute of Urology

INTRODUCTION

A mechano-sensitive sodium channel has been identified in the urothelium. Its proposed interaction with purinergic receptors may have a role in bladder sensation, e.g. urgency, in patients with an Overactive Bladder (OAB) (Ferguson, *BJUI* 1999; **84**: 235–42). Does urinary sodium affect bladder sensation in these patients?

PATIENTS AND METHODS

Patients with an OAB and detrusor overactivity were recruited. The relationship between their urinary sodium, bladder volume and bladder sensation were investigated using voiding diary with urinary sodium sampling and bladder sensation recording. The latter was performed using a validated 'urge' score (Oliver *et al. Neurourol Urodyn* 2003; **22**: 7–16). Finally, multiple (6), slow-fill urodynamics with bladder sensation recording was performed using 20 and 200 mM sodium chloride filling solution in a randomized order. Non-parametric statistical analyses were performed with $P < 0.05$ being significant.

RESULTS

There was a significant, direct relationship between bladder volume and bladder sensation. Furthermore, a significant inverse relationship existed between urinary sodium and bladder volume; and also between urinary sodium and bladder sensation. A significantly larger cystometric capacity was observed when 200 mM, compared with 20 mM, sodium chloride filling solution was used ($n = 19$).

CONCLUSION

A higher urinary sodium concentration was associated with a lower level of bladder sensation. An increase in the sodium concentration of the filling solution resulted in a larger cystometric capacity and hence a delay in the onset of desperate sensation. This study therefore confirmed a causal relationship between urinary sodium and bladder sensation in patients with an OAB.

P017

NSAIDs in the treatment of nocturnal polyuria – a prospective, randomized, double blind, placebo controlled, crossover study

S.K. ADDLA*, A.A.B. ADEYOJU*, D. NEILSON† and P.H. O'REILLY*
**Stepping Hill Hospital, Stockport, †Blackburn Royal Infirmary, Blackburn*

OBJECTIVES

To study the efficacy of diclofenac (NSAIDs) in the treatment of nocturnal polyuria.

PATIENTS AND METHODS

26 patients (20 male and 6 female) with mean age of 72 years (52–90) diagnosed with nocturnal polyuria were recruited. Nocturnal polyuria defined as production of >33% of 24-h urine output during the night time or night time to day time diuresis ratio of >1.1 on the 7-day base line frequency volume chart (FVC). Patients with renal, cardiac and hepatic failure and peptic ulcer disease were excluded. The study period comprised 2 weeks of either placebo or 50 mg of diclofenac tablet taken at 21.00 h. Following a week's rest period, patients were crossed over to the other medication for a further 2 weeks. FVC were filled in during the second week of each of the two study periods.

RESULTS

A significant subjective and objective improvement in the symptoms was noted with diclofenac when compared with the placebo. The mean number of nocturnal voids decreased from 2.7 to 2.3 ($P < 0.005$). The mean night to day diuresis ratio decreased from 1.6 to 1.3 ($P < 0.005$) and the mean ratio of nighttime to 24-h urine volume decreased from 44% to 39% ($P < 0.0005$). No significant difference in the 24 h frequency ($P = 0.4$) or 24-h urine volume was noted between the two study periods.

CONCLUSION

NSAIDs are effective in the treatment of nocturnal polyuria. Our study suggests a novel treatment option for this common condition with minimal side effects.

P018

Interstitial cystitis: does potassium sensitivity test (PST) predict response to treatment with intravesical sodium hyaluronate (SH)?

S.K. GUPTA, M. KUMAR and N.J. PARR
Wirral Hospitals NHS Trust, Warrington, UK

INTRODUCTION

Recent studies suggest that dysfunction of glycosaminoglycans may be the underlying pathology in majority of patient with interstitial cystitis (IC). PST is based on the increased potassium permeability secondary to epithelial dysfunction. Since PST diagnoses epithelial dysfunction, patients with positive PST should have higher chances of responding to intravesical SH.

The aim of this prospective study was to determine whether PST could predict response to intravesical SH in patients with IC.

METHODS AND MATERIAL

Thirty patients diagnosed of IC based on NIADDK criteria, were recruited in the study. Each patient underwent PST, which was double blinded, followed by 5 weekly doses of intravesical SH (40mg diluted in 50 cc of saline). The pre and post treatment assessment was done by self-administered interstitial cystitis symptom index and problem index described by O'Leary *et al* [*Urology* 1997; **49**(suppl. 5A): 58–63].

RESULTS

27 patients completed full course of treatment and were available for assessment.

TABLE 1

Group	PST (No. patients)	Pre-treatment CI (Mean)	Post-treatment CI (Mean)	*P*-value	Pre treatment PI (Mean)	Post treatment PI (Mean)	*P*-value
Positive	(18)	12.72	10.11	0.01	11.17	7.94	0.002
Negative or indeterminate	(9)	14	12.78	0.06	12.3	12.22	0.73

There was significant reduction in mean cystitis (CI) and problem index (PI) in patients with positive PST compared to patients with negative or indeterminate PST.

CONCLUSIONS

PST helps not only in identifying patients suitable for epithelial substitution treatment and cut down number of ineffective treatments but also pre-treatment counselling of the patients. We recommend PST to be adopted more widely.

P019

Community-treated urinary tract infections in adult males: what investigations are appropriate?

J. KHASTGIR, M. MANTLE, R. COULTHARD and A.J. DICKINSON
Derriford Hospital, Plymouth

INTRODUCTION

Urinary tract infections (UTI) in males are considered complicated, requiring detailed investigation in all. Current guidelines are not specific regarding primary UTIs. Urologists often receive referrals for investigation following treatment in the community; this study aimed to investigate the extent to which this is necessary.

METHODS

Referrals from primary care were prospectively investigated over a 9-month period with intravenous urograms (IVU), ultrasound (USS), KUB X-ray, flow studies and flexible cystoscopy. Cases with known anatomical or functional abnormalities, urological/neurological diseases, recent instrumentation/ catheters, diabetes and immunosuppression were excluded.

RESULTS

Sixty-eight men were recruited; there were 126 UTIs in 65 men who completed investigations (mean episodes 1.9, range 1–>6; mean age 52.8, range 20–86). 40% were <50 years old. Clinical presentation was variable: urgency (30.7%), frequency (63%), dysuria (60%) and retention (9.2%). Positive microbiology was available in 37 (56.8%), of which *E. coli* comprised 91.8%. IVU was normal in 41/43 (95.3%), KUB in 59/60 (98.3%) and USS in 54/62 (87.1%). Uroflowmetry indicated bladder outflow obstruction in 68% of age >50 years and 37.5% in <50 with flexible cystoscopy positive in 22.5% and 15%. The median post-void residual volume was 208.6 (range 0–2000 mL). All men with positive upper tract imaging had fever/rigors, loin pain, or >3 episodes of UTI.

CONCLUSIONS

Uncomplicated UTIs in males are not uncommon. Diagnostic criteria employed in primary care vary greatly, which makes criterion-based subsequent investigation in secondary care difficult. Abnormalities of flow rate are the commonest and standardization of upper tract imaging for specific indications is required.

P020

Female urethral dilatation – who benefits?

J. MCCABE, V. KUMAR and P. IRWIN
Michael Heal Department of Urology, Leighton Hospital, Crewe, UK

INTRODUCTION

Urethral dilatation (UD) has been a standard procedure for decades but its indications are poorly defined and its long term results are unknown. We undertook a prospective study with a 5-year follow-up to evaluate the results of UD and to identify a group for whom it may be beneficial.

METHODS

Pre-operative urinary flow rates (FR) and post-void residual measurements (PVR) were obtained on all women undergoing UD under general anaesthetic for troublesome LUTS. Postmenopausal women were randomized to receive topical oestrogen cream. Follow-up symptom scores, FRs and PVRs were performed.

RESULTS

Forty two women were enrolled; 28 were post-menopausal (mean age = 68 years) and 14 pre-menopausal (mean age = 38 years). The follow-up objective parameters for the whole group were:

Across the whole group there was a definite improvement in Q*max* and PVR at 6 months

($P = 0.02$ and $P = 0.0002$ respectively). An excellent symptomatic response was obtained in 27 patients which was accompanied by median Q_{max} improving from 12.2 ml/s to 20.2 ml/s and median PVR falling from 30 ml to 0 ml in the first 6 months. At 5 years 75% of patients maintained their response. Post-menopausal women fared better in terms of improved uroflowmetry ($P = 0.05$). The use of topical orthogynest cream had no significant impact on outcome.

TABLE 1 Follow-up flow rates (Q_{max}) and post-void residuals (PVR) [median (range)]

	pre-UD	6 months	12 months	24 months	48 months	60 months
Q_{max} (ml/sec)	12.8	20.2	17.8	15.9	17.8	19.8
	(4.9-48.3)	(1.6-51.2)	(6.2-44.6)	(9.2-57.1)	(11.2-22.5)	(11-26.6)
PVR (ml)	30	0	0	0	25	28
	(0-387)	(0-215)	(0-86)	(0-75)	(0-85)	(0-259)

CONCLUSION

Urethral dilatation confers a definite benefit both symptomatically and in terms of improved uroflowmetry. Post-menopausal women are most likely to benefit.

P021

Long-term urological sequelae and outcome of acute transverse myelitis

J.A. BYCROFT*, R. CHELVARAJAH†, R. HAMID‡, P. PATKI†, M. CRAGGS† and P.J.R. SHAH*
**Institute of Urology & Nephrology; †Spinal Research Centre, Stanmore; ‡Great Ormond Street Hospital, London, UK*

INTRODUCTION

Acute transverse myelitis (ATM) is an inflammatory disorder of the spinal cord. Whilst the acute urological problems associated with ATM have been explored to some degree, little data exists on the long-term urological outcome of ATM. The purpose of this paper was therefore to investigate the long-term outcome of ATM and to reflect on our unit's experiences with the condition.

PATIENTS AND METHODS

We performed a retrospective analysis of all patients with ATM who had been treated in our department since its establishment 18 years ago. The mean time since onset of symptoms was 12.5 years. We examined video-urodynamic and renal tract ultrasound results, reconstructive surgery undertaken and methods of bladder management in the patient group.

RESULTS

Urodynamic data was available in 12 patients (pre-operatively in those who had undergone reconstructive surgery). Eleven out of 12 patients (92%) had underlying neurogenic detrusor overactivity (NDO), whilst 5/12 (42%) had detrusor-sphincter dyssynergia (DSD). All 6 patients able to walk had NDO, whilst four had DSD. Twelve out of 14 (83%) of upper tracts were normal on ultrasound scanning. Four out of 14 patients (29%) had undergone urinary-tract reconstructive surgery. Seven of the remaining were dependent on intermittent catheterization, six of whom additionally used anti-cholinergic medication

CONCLUSIONS

ATM, and the associated urological sequelae, are poorly understood. We have described the long-term outcome in these patients. The majority of our patients required either reconstructive surgery, or a combination of intermittent catheterization and anticholinergic therapy. Importantly, clinicians should be aware of the underlying deleterious effects of urological dysfunction in the chronic ambulant ATM patient.

Tuesday 22 June 11.00–12.00
Poster Session 3: Prostate Cancer – Clinical
Chairmen: D. Gillatt and D. Green

P022

The combination of True Echo Harmonics and Colour Flow Doppler significantly improves the detection of prostate cancer at Trans Rectal Ultra Sound guided biopsy when compared to Grey Scale Ultrasound alone

N. AFZAL, A. KARIM, H. COOK, A.U. RAHMAN, M.A. HALEM and A.J. CORNABY
Dorset County Hospital, Dorset, UK

INTRODUCTION

Trans Rectal Ultrasound (TRUS) guided biopsy is the most commonly used method for diagnosing the prostate cancer. Various other imaging modalities have been used to increase the detection rate of prostrate cancer. The use of Grey Scale Ultrasound (GSUS) alone poorly identifies suspicious lesions. This aim of this study is to compare cancer detection rates, using a combination of True Echo Hormonics (TEH) and Colour Flow Doppler (CFD) with GSUS alone.

PATIENTS AND METHODS

Four hundred and five patients underwent TRUS biopsy between December 2001 and December 2003. All patients were examined using three different ultrasound modalities: GSUS, TEH and CFD. Ten systematic biopsies were performed; the number and position of any suspicious hypo-echoic areas were also noted and targeted. The cancer pick up rate for the individual imaging modalities was analysed and collated.

RESULTS

116/405 patients (28.6%) had prostate cancer in their biopsy cores. Of the cases that were positive, the use of GSUS alone identified hypo-echoic areas that were positive for malignancy in only 8.6% of cases, compared to 38.7% with the use of TEH alone and 35.3% with CFD alone. While the combination of TEH and CFD identified 50.8% of cases. This was statistically significant ($P < 0.001$).

CONCLUSION

The combination of TEH and CFD Imaging appears to significantly increase the cancer pick up rate when compared to GSUS alone and deserves further evaluation.

P023

Contemporary management of T1a prostate cancer in the UK

J.S. ROYLE*, P.R. BOLLINA†, S. FOWLER‡ and R. DONAT§
**Ninewells Hospital, Dundee; †Western General Hospital, Edinburgh; ‡BAUS; §Queen Margaret Hospital, Dunfermline, UK*

INTRODUCTION

T1a prostate cancer is an uncommon subgroup of prostate cancer. A UK urologist will diagnose only one new case per year on average. This makes systematic review of management and outcomes difficult. There are also suggestions that T1a prostate cancers are mostly low volume disease which is well differentiated and may have a better prognosis. The aim of this study was to assess the management of these cancers in the UK.

METHODS

We analysed the BAUS cancer registry minimum data set for T1a prostate cancer from 1999 to 2002. We included all patients with a clinical diagnosis of T1a cancer.

RESULTS

1231 patients were diagnosed as T1a prostate cancer. Of these 1014 (82.4%) were managed by surveillance, 69 (5.6%) had a radical prostatectomy, 76 (6.2%) received radiotherapy and 72 (5.8%) received antihormonal therapy. Within the surveillance group 351 (34.6%) patients were aged 70 years or less, including 16 (1.5%) patients with poorly differentiated cancers (Gleason

sum 7–10). 52 (5.1%) patients on surveillance had a PSA greater than 20 μg/L.

Patients on surveillance had a mean age of 72.9 years, mean Gleason sum of 4.9 and mean PSA of 11.7 μg/L, compared to those undergoing radical prostatectomy (61.0 years, Gleason sum 5.7 and PSA 6.25 μg/L, receiving radiotherapy (70.5 yrs, Gleason sum 5.3 and 12.5 μg/L) or receiving antihormonal treatment (73.3 years, Gleason sum 6.1 and 88.3 μg/L).

CONCLUSION

Most T1a prostate cancers are managed by surveillance, including a significant number of patients suitable for radical treatment.

P024

PSA to improve case selection for radical prostatectomy in the UK

M.H. WINKLER,* F.A. KHAN*, M. OKEKE†, A.A. SUGIONO†, G.B. BOUSTEAD‡, R. PERSAD§, A.V. KAISARY* and D.A. GILLATT†
**Royal Free Hospital, London; †Southmead Hospital, Bristol; ‡Lister Hospital, Stevenage; §Bristol Royal Infirmary, Bristol, UK*

INTRODUCTION

Radical prostatectomy is an increasingly popular treatment option for clinically localized prostate cancer, yet PSA outcome figures are rare in the UK. Currently, we base pre-operative patient counselling and case selection on figures from American series. We conducted an audit of PSA recurrence of 5 large centres in the south of England and investigated the use of pre-operative PSA to improve outcome.

METHOD

854 patients notes were audited for pre-operative staging parameters and follow-up data obtained. Patients with neoadjuvant and adjuvant treatment as well as patients with incomplete data and follow-up were excluded.

RESULT

Median follow-up was 52 months for the remaining 663 patients. Median PSA was 10 ng/mL. A large improvement of PSA recurrence free survival rates was observed from 1988 to 1998. Overall Kaplan Meier PSA recurrence free survival probability at 1, 3, 5 and 8 years was 0.83, 0.69, 0.60 and 0.48, respectively. 5-year PSA recurrence free survival probability for PSA ranges <4 ng/mL, 4.1-10 ng/mL, 10.1-20 ng/mL and >20 ng/mL was 0.82, 0.73, 0.59 and 0.20, respectively (Wilcoxon $P < 0.0001$). A simulation of biochemical recurrence free survival for patient cohorts with reduced inclusion PSAs suggests an improved outcome for patients with a pre-operative inclusion PSA of <12 ng/mL. Further reduction of the inclusion PSA does not improve outcome.

CONCLUSION

Intermediate PSA recurrence free survival has improved over time in England. PSA recurrence free survival estimates are less optimistic compared to frequently quoted American figures. A reduced pre-operative PSA cut-off for case selection may be used to improve outcome.

P025

Judgement analysis in prostate cancer

J. WILSON*, R. MACDONAGH*, P. EWING* and C. O'BOYLE†
**Urology Department, Taunton and Somerset Hospital; †Department of Psychology, Royal College of Surgeons of Ireland*

INTRODUCTION

To determine what information consultant urologists use making treatment choices for prostate cancer patients.

METHODS

30 consultant urologists were given 70 paper representations of prostate cancer patients. They judged how strongly they felt each case warranted radical prostatectomy, radiotherapy or conservative treatment (active surveillance or hormone treatment). The cases were presented in the style of an MDT meeting, each case having 7 'cues'; PSA, Gleason score, rectal examination, MRI/ Laparoscopy staging information, past medical history, patient preference for treatment and age. Standard Judgement Analysis methodology was employed. Regression analysis determined which of the

above 'cues' where used when forming a decision about treatment. A significance of $P < 0.05$ was taken as high likelihood of a cue being used by an individual to make a decision.

RESULTS

Of the 7 cues, on average only 3 were used by consultants to make treatment decisions. On no occasions were all cues used.

Distinct trends were seen in the use of 'cues' to make treatment judgements. If radical surgery was chosen, PSA and Gleason score where most frequently used. For Radiotherapy, staging information was most commonly used and for conservative treatment age was the paramount judgement factor. Interestingly patient choice, rectal examination and life expectancy were rarely used to make treatment decisions. Finally we found considerable variation between consultants in the specific cues employed.

CONCLUSIONS

Despite the availability of information for each patient, only small numbers of 'cues' were employed by consultants to make treatment decisions and despite uniformity of patient information the 'cues' used and judgements made by consultants was extremely variable. The data given to consultants in this study resembles that presented at MDT meetings and consequently calls into question the decision-making process at such meetings.

P026

Can urologists accurately estimate comorbid risk in men with localized prostate cancer?

R. SINGH and T. O'BRIEN
Guys Hospital, London, UK

INTRODUCTION

Radical treatment for localized prostate cancer is recommended only to men with a 10-year life expectancy. Accurate assessment of comorbid risk therefore is essential to good decision-making. A number of objective comorbidity risk scores are now available but most Urologists continue to rely on a subjective assessment. We have tested the ability of Urologists to estimate comorbid risk in relation to actual predicted outcomes using validated scoring systems.

METHODS

17 theoretical clinical scenarios carrying different levels of comorbid risk were developed using parameters derived from the Framingham cardiac risk score, Charlson's combined age-comorbidity score and actuarial life-tables. 43 British Urologists were then asked to estimate the 10-year risk of a major cardiac event and the 10-year risk of death from all causes for a man with localized prostate cancer aged 57, 64 and 70 years of age. The results were then compared to the actual predicted values.

RESULTS

Median estimates of life expectancy were 2, 2.5, 3 and 5 years below actuarial predicted values for a 57, 64, 70 and 74 year old male respectively.

In 35% of scenarios the 10-year cardiac risk was underestimated. All these scenarios involved a history of hypertension, hypercholesterolaemia or smoking. In the remaining 65% of scenarios 10-year cardiac risk was overestimated.

In 35% of scenarios the 10-year risk of death from all causes was underestimated. These scenarios involved men with multiple pathology - peptic ulcer disease, moderate rheumatoid arthritis, previous colonic carcinoma, peripheral vascular disease and diabetes with end-organ damage. In the remaining 65% of scenarios 10-year risk of death was overestimated.

CONCLUSIONS

Urologists over emphasized the importance of age and under emphasized the effect of hypertension, smoking and hypercholesterolaemia in the determination of comorbid risk.

Routine use of objective validated tools for comorbidity assessment will improve selection of patients for radical treatment for localized prostate cancer.

P027

When prostate cancer sets sail it steers a true course

J.L. BODDY*, D.J. PIKE† and P.R. MALONE*
**Royal Berkshire Hospital, Reading; †School of Applied Statistics, University of Reading, UK*

INTRODUCTION

Estimates suggest that less than one third of patients with Gleason 6 cancer, independent of age, will die from their disease during a 15-year period.

The concept of monitoring the rate of rise in PSA over a period of time in order to predict the likelihood of disease progression and therefore the need for treatment is emerging. However, this model will only be viable if the rate of PSA rise is constant throughout the disease.

PATIENTS AND METHOD

Known cases of prostate cancer, managed expectantly for a minimum period of 4-years, were included. Following review of the hospital notes and pathology database the PSA velocity (PSAV) was calculated as close to the 2-year period as possible and compared to that at the end of the study period.

RESULT

Thirty-one men were followed-up for a mean period of 68.2 months (48–120). The mean number of PSA tests per patient was 11.2 (5–23). The mean PSAV at 2-years was 0.98ng/mL/year (–1.55–9.98) and that at the end of the study was 1.07ng/mL/year (–0.63–7.52). The degree of correlation in the velocities at these two time points was 0.9 ($P < 0.01$).

CONCLUSION

Early PSA velocities can be extrapolated to predict future PSA levels in patients managed expectantly for prostate cancer. We propose that patients with small-volume Gleason 6 cancers could be monitored for a 2-year period and then a decision of whether or not to treat their disease can be made based on their PSAV.

P028

How does radical perineal prostatectomy compare as a minimally invasive treatment for early prostate cancer?

M. MANTLE*, J. KHASTGIR†, S. DAVIS* and P. MCINERNEY*
**Derriford Hospital, Plymouth; †Royal Devon and Exeter Hospital, Exeter*

INTRODUCTION AND AIMS

Radical perineal prostatectomy (RPP) and laparoscopic radical prostatectomy (LRP) offer minimally invasive treatments for localized prostate cancer with the claimed advantage of reduced morbidity and hospital stay. We reviewed the results of our 8 year experience with RPP and compared them with published data on LRP.

PATIENTS AND METHODS

Patients who had undergone RPP were identified and a retrospective review of their medical notes performed. Operative details, complications and outcome were recorded.

A literature search was performed for papers reporting results of LRP. Cumulative data was then compiled from these papers.

RESULTS

147 patients underwent RPP. Mean op time was 125 min (60–180). Median EBL was 600 mL (200 mL–5 L). 2% suffered rectal injury, 4% wound infections and 3.4% anastomotic leak. 2 (1.4%) early and 2 late re-operations were required. Mean hospital stay was 4.8 days (2–18). 1 patient (0.7%) developed an anastomotic stricture. 4.4% of patients had late incontinence requiring pads. Total potency was 22%.

Ten papers have reported LRP results (1989 patients). Mean op time 268.7 min (155-427). Mean EBL 454 mL. Conversion rate 2–10.2%. 1.6% suffered rectal injury, 0.5% bladder injury and 0.7% intestinal injury. 5.9% had anastomotic leak. Mean hospital stay was 7.2 days. 3.6% required early reoperation and 4.4% late reoperation. 3.5% had anastomotic stricture. 450 patients had long term continence reported; 95% were continent at 18 months. Potency rates were poorly reported.

CONCLUSION

RPP is associated with a low morbidity and compares favourably to LRP. Data on biochemical recurrence following LRP is awaited.

P029

Diameter of the largest focus of perineural invasion in the radical prostatectomy specimen as a predictor of eventual treatment failure

F.A. KHAN, M.E. LANIADO, N. WILSON, M. JARMULOWICZ and A.V. KAISARY
Royal Free Hospital, London, UK

INTRODUCTION AND OBJECTIVE

Perineural invasion (PNI) may be a route for prostate cancer dissemination and the presence of PNI predicts disease recurrence after radical prostatectomy (RP) on univariate but not multivariate analysis. Recently Maru *et al.* in the USA have shown that the maximum diameter of PNI rather than its mere presence is an independent predictor of disease recurrence over and above Gleason score, PSA and pathological stage (*Hum Pathol* 2001; **32**:828–33). The objective of this study was to determine if maximum diameter of PNI was also important in patients from the UK.

METHODS

The maximum diameter of PNI found in the radical prostatectomy specimen was analysed from 107 patients treated between 1994-2000. Exclusion criteria included neoadjuvant hormonal therapy, or adjuvant therapy before evidence of treatment failure. PNI diameter, Gleason score, pre-treatment PSA, and pathological stage were compared with evidence of disease recurrence (PSA>0.4 ng/mL, local/systemic progression, onset of adjuvant treatment). Kendall tau was used to calculate correlation and medians to describe central tendencies for patient characteristics. CI = 95% confidence interval.

RESULTS

Patient characteristics ($n = 107$): PSA 8.9 ng/mL, Gleason score 7, pathological stage T3a, positive margin rate 23%, and median follow was 29 months. The median PNI diameter was 0.315 mm (interquartile range 0.25 to 0.4). The diameter of PNI was correlated with Gleason score (0.21, CI 0.01 to 0.33), pathological stage (0.35, CI 0.25 to 0.453) but not PSA (0.16, CI –0.025 to 0.29). On univariate Cox proportional hazards regression, Gleason score ($P = 0.004$), pathological stage ($P = 0.0001$) and PNI diameter ($P = 0.04$) were associated with disease recurrence. Patients with a PNI diameter in excess of 0.8mm were more likely to suffer from biochemical failure.

CONCLUSION

PNI diameter is significantly associated with features characteristic of disease failure and predicts biochemical failure following radical prostatectomy. One study has shown that it is an independent variable predicting disease recurrence following RP, with which data from this study are consistent.

P030

A clinical trial of virus-directed enzyme prodrug therapy (VDEPT) using adenovirus encoded nitroreductase (ntr) and CB1954 in patients with localized prostate cancer (PCa)

P. PATEL*, N.D. JAMES*, J.G. YOUNG*, D.M.A. WALLACE†, H.Y. LEUNG‡ and J. ELLIS§
**University of Birmingham, Birmingham, UK; †Queen Elizabeth Hospital, Birmingham, UK; ‡University of Newcastle, Newcastle, UK; §ML Laboratories, Keele, UK*

INTRODUCTION

We report a phase I clinical trial in PCa, using intraprostatic (ip) injection of a replication defective adenovirus encoding ntr (CTL102) ± iv prodrug CB1954. Ntr converts the weak monofunctional alkylating agent CB1954 into a highly cytotoxic bifunctional alkylating agent.

METHODS

Patients underwent TRUS-guided ip injection of CTL102 in escalating doses, with subsequent prostatectomy (gene expression study) or iv CB1954 (therapeutic group) 48-72h post injection. Ntr expression in resected tissue was assessed by immunohistochemistry. Primary endpoints were safety and tolerability; secondary endpoints were gene expression and efficacy in therapeutic group only.

RESULTS

16 patients have been treated with virus alone with no virus related serious adverse events. Dose escalation is ongoing. TRUS images demonstrate virus disseminating through the injected lobe. Ntr staining was seen in tumor, glandular epithelium and stroma. Increasing the injection volume achieved more widespread ntr expression. We have treated 1 patient in the inoperable arm with biopsy confirmed locally relapsed hormone refractory PCa. Both virus and prodrug injections were well tolerated with no significant toxicity apart from a transient grade 2 transaminase rise at day 8. At 1 month, TRUS showed a hypoechoic zone in the injected region and a >50% PSA

fall coupled with improvement in LUTS.

CONCLUSIONS

Direct ip injection of CTL102 is feasible and safe, with evidence of dose related transgene expression. The maximum tolerated dose has not yet been achieved and dose escalation is continuing. Ntr expression was sufficient to initiate the therapeutic arm and one patient has been treated, with encouraging results.

P031

Epirubicin carboplatin and 5–fluorouracil (ECarboF) chemotherapy in hormone refractory recurrent or metastatic prostate cancer

A.J. BIRTLE, J.C. NEWBY and S.J. HARLAND
The Meyerstein Institute of Oncology, The Middlesex Hospital, UK

INTRODUCTION

Cytotoxic chemotherapy in hormone refractory prostate cancer (HRPC) has been disappointing but recent phase II studies are encouraging. Results may be confounded by concomitant steroid use for nausea prophylaxis. Response rates of >40% with epirubicin, cisplatin and 5-fluorouracil have been observed and carboplatin substitution for cisplatin (ECarboF) allows outpatient administration and potential reduction of auditory/renal toxicity. We wished to examine the efficacy and toxicity of the ECarboF regime in HRPC, ensuring that benefit was not attributable to co-administered steroids.

MATERIALS AND METHODS

Patients with recurrent/metastatic HRPC after first-line hormonal failure, performance status 0-2, and no previous chemotherapy treatment were eligible. Previous hormone therapy was continued but not altered. A 4-weekly regimen: D1:epirubicin 50 mg/m^2, carboplatin (AUC 5), 5-FU 450 mg/m^2; D15 5-FU 450mg/m^2, was given, (maximum 8 cycles). Concurrent steroid use was avoided in steroid-naïve patients. PSA and symptomatic response and toxicity were measured.

RESULT

80 patients, median age 64 years, were treated. A median of 5 cycles were given with 57 % dose reductions/delays. Neutropenic sepsis rate was 8.7%. 45% of patients showed PSA responses and 41/63 had symptomatic benefit. Median response duration was 9.5 months (range 7–17). Of 21 previously steroid-naïve patients, 7 required dexamethasone for emesis or neurological deterioration and 14 did not. Response was similar in both previously steroid-naïve groups. Overall 1 year survival was 40 %.

CONCLUSION

We demonstrate the efficacy and manageable toxicity of outpatient ECarboF in selected patients with HRPC and recommend further evaluation including QOL measurement.

Tuesday 22 June 14.30–15.30
Poster Session 4: Clinical Governance
Chairmen: M. Harrison and K. Sethia

P032

Trends in referral pattern to a haematuria clinic and subsequent effect on the yield of malignant urological diagnoses

T.J. EDWARDS, S. NATALE, A.J. DICKINSON and J.S. MCGRATH
Derriford Hospital, Plymouth, UK

INTRODUCTION

The introduction of haematuria clinics and the 'two-week wait' guideline has led to an increased proportion of patients being investigated for the presence of microscopic haematuria. The authors describe the impact on the relative numbers of malignant diagnoses detected in the haematuria clinic setting.

METHOD

During the period November 1998 to July 2003, 4020 patients were investigated in a protocol-driven haematuria clinic at a single institution. All data were recorded prospectively including mode of presentation and final diagnoses.

RESULTS

Workload has almost doubled during the study period from 56 patients per month in 1998 to 101 patients per month in 2003. The relative proportions of macroscopic versus microscopic haematuria have shifted from 2 : 1 to 1 : 1 during the same period. The annual percentage of bladder TCCs detected has fallen from 10.7% to 6.9% of all patients attending. The same trend has been noted with regard to renal cell carcinomas. The absolute number of malignancies year-on-year has remained static.

CONCLUSIONS

The increased tendency for patients with microscopic haematuria to be referred and investigated in the haematuria clinic has not lead to an absolute or relative increase in the detection of urological malignancies. Service planning must allow for an ever-increasing workload through the haematuria clinic but there is no evidence that this will lead to a requirement for increased theatre capacity.

P033

Flexible cystoscopy – are we using it judiciously?

V. KUMAR*, E. COSSAR†, H.R. PATEL†, S.M. NATHAN†, R.A. MILLER† and A.H. LAWSON‡
**The Whittington Hospital, London & Harrogate Health Care; †The Whittington Hospital, London; ‡Harrogate Health Care, Harrogate, UK*

INTRODUCTION

Flexible cystoscopy (FC) is a common diagnostic tool used in day-to-day urological practice. The learning curve for performing this procedure is short and nurse specialists, junior urological trainees often do it independently. As a consequence there has been criticism that urologist overuse this diagnostic tool.

MATERIALS AND METHODS

This is a retrospective analysis of case notes of all the patients, identified by PAS and OPCS procedural index code, attending for FC in a district hospital for a period of one year. FC for indications, other than haematuria and check FC, were analysed for their diagnostic yield and support in further management.

RESULTS

A total of 1390 FC were performed during the study period. 690 patients had check FC for Bladder tumour and 405 were part of haematuria work-up. Finally 295 patients qualified for the study. 158 of these studies were normal. Out of 137 abnormal FC, 18 had bladder tumour. Other salient diagnoses were Urethral Stricture 11, Meatal stenosis 5, Bladder neck stenosis 4, Bladder calculi 2 and CIS Bladder 2.Overall 46.14% cystoscopies had positive findings. Cancer detection rate was 6.10%. Cystoscopy altered the management in 14.08% of patients and was supportive to diagnosis and management in 32.06% of patients.

CONCLUSION

FC, used judiciously outside the boundaries of standard indications, has a rich diagnostic value. Certainly this procedure is not overused and the ever-increasing workload of urology department may require this tool to be used further, which has resource implications for the National Health Service.

P034

The second national laparoscopic nephrectomy audit

K. DAVENPORT*, P. DOWNEY†, A. TIMONEY* and F. KEELEY*
North Bristol NHS Trust; †South Manchester University Hospitals NHS Trust

INTRODUCTION

Data are presented from the second national laparoscopic nephrectomy audit.

METHOD

All urological surgeons were invited to provide data on laparoscopic nephrectomy procedures performed between 1st July 2002 and 30th June 2003. A standard data collection form was used to obtain demographic data, operative information, conversion, transfusion and complication rates and the length of postoperative stay.

RESULTS

51 consultants from 42 centres provided data on 433 patients. The majority of cases were performed for non-function and renal cell carcinoma. The mean operative time was 168 minutes. The median postoperative stay was 5 days. The mean conversion rate was 10.5% and the complication rate was 20.8% with a mortality rate of 1.6%.

CONCLUSION

This audit has encouragingly revealed results similar to the audit for 2001-2002. The data is also in accordance with the world literature.

P035

Laparoscopic nephrectomy – governance and cost issues in a district general hospital

N. SHROTRI* and A. RANE†
**Kent and Canterbury Hospital, Canterbury; †East Surrey Hospital, Redhill, UK*

AIM

Laparoscopic surgery is an exciting development in urology. With no previous experience in laparoscopy, it was difficult to start a new procedure in the face of strict clinical governance. We aim to present the results of our initial experience in starting a laparoscopy service in a UK district general hospital.

MATERIALS AND METHODS

The decision to offer a laparoscopic urology service was taken in June 2001 and a year was spent at various dry labs, animal labs, courses, and attending centres of repute to observe high volume laparoscopic urology. Once sufficient skills had been thought to be acquired, the first laparoscopic nephrectomy was carried out in June 2002. In the subsequent 12 months, 19 patients (13 male and 6 females underwent surgery. There were 6 simple nephrectomies, 11 radical nephrectomies and 2 nephroureterectomies. 14 were carried out with the use of hand assist devices (HADS); the other 5 were retroperitoneoscopic procedures.

RESULTS

Mean EBL was 250 ml and median in patient stay was 4 days. There was 1 elective conversion to an open procedure, no major complications and the mean post operative stay was 4 days. We compared the average price of each procedure, to include the cost of overnight inpatient hospital stay. The hand-assisted nephrectomy cost £3700 and the retroperitoneoscopic procedure cost £2700 whereas the average conventional open surgery to include the historical 7-day in-patient stay cost approximately £3000.

CONCLUSION

Laparoscopic nephrectomy is an acceptable, safe procedure and fares well when compared to historical data for open procedures; also, the overall cost of a laparoscopic nephrectomy is comparable with the open surgical procedures. The main advantages are decreased hospital stay and rapid return to normal activity, the disadvantages being the high cost of disposables and the availability of mentorship. Feasibility would have been difficult and the results less acceptable in the absence of a mentor.

P036

Mentorship in laparoscopic urology

P. DASGUPTA* and A. RANE†
**Guys and St. Thomas Hospitals and GKT School of Medicine; †East Surrey Hospital, Redhill, UK*

INTRODUCTION

There has been a significant increase in the number of urologists in the UK who have taken up laparoscopic techniques over the past months. Urological associations including BAUS do not yet have established training standards required for safe practice. We present our method for safe training and analyse its implications.

METHODS

Within the Southern Laparoscopic Urologists Group (SLUG), a mentor is identified to supervise a trainee through various steps of laparoscopic training after completion of dry and wet labs. The mentor travels to the trainee's institution and offers helpful advice and criticism during laparoscopic cases. As this involves 'hands-on' commitment the mentor usually requires local manpower and occupational health clearance and is issued an honorary contract. This can often take up to 3 months.

In the course of training the final responsibility lies with the mentor, who should be in a position to advice against independent surgery if he is so inclined.

We objectively assessed the time, sessional and financial commitments of mentorship programs from the trainer's perspective.

RESULTS

The mentor should in our opinion have performed 50 independent cases. Each trainee should perform around 12–15 cases with the mentor prior to independent practice. It is accepted that there will be exceptions to this but the data is based on 6 trainees who took 24 months to train – an average of 4 months each. One trainee is taking longer and is being mentored into his 8th month at present.

The financial cost varies with the distance travelled by the mentor. It also equates to a NHS session per week away from the home trust and needs prior agreement with colleagues and management.

CONCLUSIONS

Safe training in laparoscopic urology requires considerable long-term commitment by both trainee and mentor. It also has far reaching implications with regards to expenditure and job planning.

P037

Write to know: copying letters to patients

L.K. LEE and B.L. JENKINS
Royal Bolton Hospital, Lancs, UK

Patients benefit from receiving copies of their hospital correspondence if they understand its contents. Therefore, do clinicians need to change their writing style? This study surveyed the patients' views on the style, clarity and usefulness of receiving clinic letters.

Fifty consecutive follow-up patients were asked if they wished to receive a copy of the clinic letter. If the patient assented, they were recruited to evaluate 2 styles of letters. The first was a copy of the letter to their GPs (with the clinical terminology explained) sent following their previous attendance. The second was a simplified letter written directly to them about their recent outpatient visit.

Two-thirds of the patients ($n = 34$) wanted a clinic letter and of these, 29 (85%) returned their questionnaires. The mean age of the responders was 68 years old (range 34–91 years). They found the patient-directed letters easier to comprehend with 25 (86%) and 3 (10%) understanding all or most of the letter respectively. However, comprehension of the GP-letters was also high, with 16 (55%) and 11 (38%) understanding all or most of the letter respectively. Over 90% felt that both styles of letters useful and matched the information given to them. Twenty-one patients (72%) preferred the patient-directed letters, whereas 6 patients (21%) would rather receive a copy of the GP's letter.

Although the majority preferred the patient-directed letters, the high degree of comprehension of both letters by our patients indicates that it would suffice to copy to them the GPs' letters.

P038

Informed consent: are we deluding ourselves?

J. MASOOD, A. HAFEEZ, R. ROBSON, S. DHALLA, O. WISEMAN and J.T. HILL
Harold Wood Hospital, Romford, Essex, UK

INTRODUCTION

Informed consent implies that health care professionals spend the necessary time and effort for patients to understand proposed treatment with consideration of their abilities. We looked to determine the degree to which patients understand the nature and risks associated with routine endoscopic urological surgery and whether providing additional written information improves this.

METHODS

80 patients undergoing transurethral resection of the prostate (TURP) or transurethral resection of bladder tumour (TURBT) for the first time were randomized to obtain routine standardized verbal consent only or in addition written standardized consent as produced by The British Association of Urological Surgeons. On discharge patients completed a questionnaire testing their knowledge of the nature of the condition with the surgical and anaesthetic risk.

RESULTS

45 patients undergoing TURP and 35 patients undergoing TURBT were recruited. 14% of those receiving verbal and 23% of those receiving verbal and written consent did not know what operation was performed. 35% of patients in the verbal consent group and 30% of patients in the verbal and written group could not give a satisfactory explanation to how the surgery was performed. Overall 52% of patients remembered 1 or less surgical complication and 80% one or less anaesthetic complication. 91% of patients felt that complications were adequately explained and nobody had any criticism of the consent procedure.

CONCLUSION

Additional written consent did not improve patient's understanding of the nature of the surgery or the risks and complications of the procedure. Verbal and written information seems inadequate and the whole informed consent issue needs revisiting.

P039

BAUS procedure specific consent forms: a prospective study of the impact on clinical workload

J. CRESSWELL, Y. MAEDA, A.W. BALUCH and J.A. CUMMING
Cumberland Infirmary, Carlisle

INTRODUCTION

Procedure specific consent forms have been advocated to improve the process of obtaining informed consent. A prospective study was performed to assess the effect of procedure specific forms on the time taken to obtain consent, and the recording of risks discussed with patients.

PATIENTS AND METHODS

The time taken for obtaining consent from 229 patients was recorded prospectively over 4 months. For 2 months, the Department of Health standard consent form 1 was used (group 1; 115 procedures). For 2 months the outcomes and complications section of procedure specific forms were included (group 2; 114 procedures). The two groups were similar in respect of urological procedures and for patient characteristics. Details of risks recorded for group 1 were examined retrospectively and compared to the corresponding procedure specific forms.

RESULTS

The average time for consultation for group 1 was 3.4 minutes and for group 2 was 4.9 minutes ($P < 0.0001$) (range 1–14 minutes for both groups). Over 2 months, 6.5 hours were dedicated to obtaining consent from group 1, and 9.4 hours for group 2. Risks recorded on the handwritten forms were brief, and in all cases failed to meet the standards of the procedure specific forms.

CONCLUSIONS

Procedure specific consent forms encouraged detailed appraisal of risks to patients and provided recorded details for inclusion in patient notes. However, the time taken to obtain consent was significantly increased. Our data suggest that this activity may require the equivalent of one clinical session per month per consultant.

P040

A dedicated weekly clinic can reduce urological emergency admissions

C. CALLEN, N.J. BARBER, S. CHANDRASEKERA, K. WALSH, P.M. THOMPSON and G.H. MUIR
King's College Hospital, London, UK

INTRODUCTION

In an effort to improve the journey of patients through A+E and relieve the growing pressure on inpatient beds, protocols for the outpatient management of urological emergencies, including acute urinary retention and ureteric colic, have been developed. However, the implementation of such protocols is confounded by distrust of follow up arrangements and patients may languish for many weeks before outpatient review. Our aim was to develop a reliable service that would allow early review of emergency referrals within the urology department and thus maximize the outpatient management of these patients.

METHODS

A new weekly clinic staffed by two middle grades and a nurse specialist with rotating consultant cover was established. Patients are booked into this clinic by members of the urology team or the A+E department in consultation with our team. The Urology admissions data for the last 3 years was analysed.

RESULTS

Prior to the establishment of this new service the annual emergency admission rate varied by less than five percent per annum. Month for month comparison was then made between 2002 prior to the new clinic and 2003 with it in effect. Total admissions decreased from 450 in the eight month period April to December 2002, to 289 for the same period in 2003. This represents a drop of 35.8% overall.

CONCLUSION

The emergency admission rate significantly reduced following the implementation of this clinic. This has resulted in a more efficient service both for patients, who now avoid an unnecessary hospital admission, and for the hospital in terms of bed occupancy.

P041

The need for supervised training in urology outpatients: a case for restructuring

J. MASOOD, D. WOOD, J. CALLEARY, O. WISEMAN, T. LANE and J.M. BARUA
Harold Wood Hospital, Romford, Essex

INTRODUCTION

The requirement for supervision of trainees is important in all areas in order to ensure good patient care and training. It is vital with reduced hours and increased emphasis on outpatient care that training and its monitoring in outpatient clinics is closely scrutinized. This is a prospective multicentre study looking at the training and supervision received by urology registrars in outpatients in the South East.

METHODS

Specialist registrars (SpRs) completed questionnaires to ascertain if training episodes arose in outpatients and recorded these as active (consultant initiated) or passive (trainee initiated) for every patient seen over a year period. Changes in patient management and educational benefit were assessed and recorded by trainees. The case-mix of new and follow-up patients was noted.

RESULTS

1056 patient episodes were recorded. 962 (91%) follow-up patients and 94 (9%) new patients were seen. Training episodes were noted in only 11% of patients. Active training episodes arose in 31 patients (3%) and passive episodes in 82 patients (8%) (61% were for reassurance, 24% to list patients for surgery and 15% due to the trainee being unsure how to proceed). Management changed in 56% of passive episodes and 52% of active episodes. 88% of active episodes and only 20% of the passive episodes were felt to be educationally beneficial by the trainees.

CONCLUSION

This study highlights a lack of structured supervision and new patient assessments in outpatient clinics. Training in outpatient clinics needs restructuring and keeping an outpatient clinic logbook may provide an important method of monitoring and appraising outpatient training.

P042

Five-year experience of a urological diagnostic and treatment facility in a large district general hospital

P. SIMPSON, T. THORNE, D. WOOD and S.S. GUJRAL
Harold Wood Hospital, Romford, Essex, UK

INTRODUCTION

Diagnostic and treatment centres are developing nationally. Our department has been using this concept in a dedicated ward facility over a number of years. We present data from the last 5 years demonstrating benefit both to patients and the urological unit that such a service offers.

PATIENTS AND METHODS

The service was developed by a nurse specialist lead multidisciplinary team. The staff comprises nursing staff, specialist practitioners, radiographers and medical staff as required. Data on all patients managed on the ward have been collected, over a 5-year period. The unit offers facilities for emergency assessment, day surgery, therapies such as intravesical chemotherapy, in-house ultrasonography, urodynamics, intermittent self-catheterization training, clinics, e.g. haematuria and prostate assessment, lithotripsy and preadmission clinics.

RESULTS

Over a 5-year (1998–2003) period 47 960 urology patients have been treated within this facility. The greatest use made the unit was for diagnostic testing (58.4% (27538) renal ultrasound, flexible cystoscopy, urodynamics and transrectal ultrasound and biopsy). This has lead to a 100% fulfillment of the 2 week wait referral criteria. 10.8% (5084) patients attended the urology emergency receiving room. Other admissions were for day surgery, ward treatment or preoperative assessment.

CONCLUSION

This facility offers a seamless and comprehensive service that other specialities have now started to use. It allows the urology department direct control over investigation of patients, particularly those who fall within the Government's category for urgent referral. It efficiently relieves some of the pressure that has hitherto fallen on other clinical areas.

Tuesday 22 June 16.00–17.00
Poster Session 5: Urinary Incontinence
Chairmen: M. Lucas and M. Speakman

P043

Short term results of minimally invasive outpatient local anaesthetic administration of botulinum toxin-A for idiopathic detrusor overactivity (IDO)

R.B. POPAT*, A. APOSTOLIDIS*, G. GONZALES*, T. YAP*, C.J. FOWLER* and P. DASGUPTA†
**Department of Uro-Neurology, The National Hospital for Neurology; †GKT School of Medicine and Guys & St. Thomas Hospital, UK*

INTRODUCTION

We have been using a flexible cystoscope to inject Botulinum toxin-A as an outpatient procedure into the detrusor muscle and present our results of treating patients with severe IDO.

METHOD

Under antibiotic cover, 200 units of Botox® diluted in 20 ml of normal saline were injected over 20 injection sites along the dome, lateral and posterior walls of the bladder, sparing the trigone. The procedure took 20 min and patients were asked to rate discomfort on a scale of 0–10.

RESULTS

Eighteen patients (10 men) have been treated, mean age 47.0 ± 1.08 years. The mean discomfort score was 3.09 ± 0.28. There was a statistically significant improvement in the LUTS at 4 ($n = 17$) and 16 weeks ($n = 14$). One patient developed a UTI and two patients have needed to start CISC.

The maximum cystometric capacity (ml) increased form 196.9 ± 23.6 to 385.8 ± 41.7 at 4 weeks and to 355.0 ± 44.5 at 16 weeks. The maximum detrusor pressure (cmH_2O) during filling reduced from 65.5 ± 10.4 to 38.1 ± 7.97 at 4 weeks and to 35.4 ± 5.77 at 16 weeks.

The leak episodes in 24 hours reduced from 5.03 ± 1.19 to 0.63 ± 0.21 at 4 weeks and to 0.57 ± 0.3 at 16 weeks. The frequency of voiding reduced from 13.6 ± 0.96 to 7.71 ± 0.73 at 4 weeks and to 7.6 ± 0.82 at 16 weeks. The beneficial effects last for 9 months when injections are repeated.

CONCLUSION

Injections of botulinum toxin are well tolerated using our technique and is an effective alternative treatment for patients with intractable IDO.

P044

Short term results of minimally invasive outpatient local anaesthetic administration of botulinum toxin-A for neurogenic detrusor overactivity (NDO)

R.B. POPAT*, A. APOSTOLIDIS*, T. YAP*, G. GONZALES*, C.J. FOWLER* and P. DASGUPTA†
**Department of Uro-Neurology, The National Hospital for Neurology; †GKT School of Medicine and Guys & St. Thomas Hospital, UK*

INTRODUCTION

We have been using a flexible cystoscope to inject botulinum toxin-A as an outpatient procedure into the detrusor muscle and present our results of treating patients with severe NDO.

METHOD

Under antibiotic cover, 300 units of Botox® diluted in 30 mL of normal saline were injected over 30 injection sites along the dome, lateral and posterior walls of the bladder, sparing the trigone. The procedure took 20 minutes and patients were asked to rate discomfort on a scale of 0–10.

RESULTS

Thirty-two patients (9 men) have been treated, mean age 49.2 ± 2.08 years. The mean discomfort score was 3.09 ± 0.28. There was a statistically significant improvement in the LUTS at 4 ($n = 29$) and 16 weeks ($n = 20$). Two patients developed a UTI and 2 patients have needed to start CISC. The rest of the patients already performed CISC.

The maximum cystometric capacity (mL) increased from 232.8 ± 25.6 to 534.4 ± 28.9 at 4 weeks and to 405.9 ± 32.4 at 16 weeks. The maximum detrusor pressure (cmH_2O) during filling reduced from 56.8 ± 6.9 to 27.0 ± 3.76 at 4 weeks and to 26.7 ± 3.63 at 16 weeks.

The leak episodes in 24 hours reduced from 3.89 ± 0.63 to 0.5 ± 0.17 at 4 weeks and to 0.8 ± 0.23 at 16 weeks. The frequency of voiding reduced from 12.6 ± 0.74 to 6.32 ± 0.72 at 4 weeks and to 7.09 ± 0.8 at 16 weeks.

CONCLUSION

Injections of botulinum toxin are well tolerated using our technique and is an effective alternative treatment for patients with intractable NDO.

P045

Changes in human bladder suburothelial innervation following treatment of detrusor overactivity with intra-detrusor botulinum toxin injections

A. APOSTOLIDIS*, R. POPAT*, J.B. DAVIS†, P. DASGUPTA‡, C.J. FOWLER* and P. ANAND§
**National Hospital for Neurology, Department of Uro-Neurology; †Neurology and GI Centre, GlaxoSmithKline, Harlow; ‡Guy's and St. Thomas Hospitals, Department of Urology; §Hammersmith Hospital, Imperial College London, UK*

INTRODUCTION

We aimed to examine the mechanism of action of intra-detrusor injections of botulinum toxin type A (BoTx/A) in intractable detrusor overactivity (DO) by studying the immunohistochemical changes in the suburothelial innervation in treated patients.

PATIENTS AND METHODS

Flexible cystoscopic bladder biopsies were obtained from 36 patients (22 neurogenic DO, 14 idiopathic DO) before and during sustained improvement at 4 and 16 weeks after treatment with BoTx/A injections. Control tissue was obtained from 11 stable bladders. Specimens were incubated with specific antibodies to the pan-neuronal marker PGP9.5, the afferent marker TRPV1 (vanilloid

receptor), and the cholinergic marker acetylcholinesterase (AChE). *P*-values <0.05 were considered statistically significant.

RESULTS

Mean ± SEM density of PGP9.5 (+) fibres remained unchanged at 4/52 post BoTx/A (1.85 ± 0.22 vs pre: 2.04 ± 0.24, $P = 0.39$), and at 16/52 (1.63 ± 0.22, $P = 0.35$). No change was found in AChE (+) nerve fibres at 4/52 (0.91 ± 0.15 vs baseline: 0.96 ± 0.14) or at 16/52 follow-up (0.68 ± 0.16, P=0.18; controls: 0.72 ± 0.25). However, TRPV1-expressing fibres decreased at 4/52 post-BoTx/A (0.47 ± 0.11 vs 0.27 ± 0.05), but more significantly at 16/52 (0.11 ± 0.04, $P = 0.0004$) to controls' levels (0.17 ± 0.09).

CONCLUSIONS

Absence of substantial suburothelial neuronal or cholinergic fibre degeneration, together with the significant decrease of TRPV1 expressing fibres, or of their level of TRPV1 expression, in overactive bladders successfully treated with BoTx/A suggest that the clinical response of such patients may be partly the result of alterations in the suburothelial afferent mechanisms.

P046

Urgemeter cystometry – urodynamic assesment of urgency and the relationship of urge to detrusor overactivity

J.A. MOORE*, J.G. NOBLE* and A.F. BRADING†
**Churchill Hospital, Oxford; †University of Oxford, UK*

INTRODUCTION

Bladder sensations are difficult to evaluate because of their subjective nature. The aim of this experiment is to develop better methods for assessing patient's sensations, particularly urgency, during urodynamics and evaluate the relationship between urgency and intravesical pressure change without the need for clinician to patient dialogue which may introduce bias and error.

PATIENTS AND METHODS

We designed the urgemeter which consists of a compressible hand held device connected by air filled cystometry tubing to a spare pressure transducer inputting to standard urodynamic hardware. Patients were instructed to squeeze the device if they experienced urgency and the stronger the urge the harder they should squeeze. This gave a continuous tracing of the patients urge alongside other cystometric data during artificial filling using standard urodynamic techniques.

RESULTS

22 patients with overactive bladder underwent urgemeter cystometry. Patients found the device extremely simple to use and the relationship between urgency and intravesical pressure was easy to interpret. 13/22 patients had urgency during filling with no increase in P_{det}. Interestingly nine of these complained of urge incontinence for which one might expect unstable contractions. 7/22 patients had urgency, five of which demonstrated a close temporal relationship between phasic increases in P_{det} and urgency, urge preceding pressure rise in all. Two patients had normal cystometrograms and no urgency.

CONCLUSIONS

This prototype facilitates patient recording of urgency during cystometry and introduces objectivity into the assessment of sensation during artificial filling. For the majority of patients detrusor pressure increase was not prerequisite for the sensation of urgency.

P047

Comparison of transurethral collagen injection and perineal bone-anchored male sling for the treatment of intrinsic sphincter deficiency

A. SINGLA and R. ONUR
Wayne State University, Department of Urology

PURPOSE

In the present study we compared the efficacy of collagen injection and bone-anchored male sling in the treatment of post-prostatectomy incontinence.

PATIENTS AND METHODS

Two cohorts of men, one which received transurethral collagen injection (group 1) and one perineal bone-anchored male sling (group 2) using In-Vance bone drill (American Medical Systems, Minnetonka, MN, USA) were examined. Patient characteristics, mean injection of collagen, mean cumulative volume, post-operative outcome and complications were noted. Efficacy of the procedures were compared between two groups.

RESULTS

A total of 34 incontinent patients (mean age 69), received a mean of 2.1 injections of collagen (mean cumulative volume injected 9 ml.) whereas, thirty-seven men, (mean age 71) underwent male sling. Preoperatively, patients required a mean of 5.5 and 4.2 (1–10) pads per day, respectively. Mean follow-up was 15 vs. 18 months. There was no difference between two groups with respect to post-operative complications, i.e. urinary retention, de novo urge/urge incontinence, infection and urethral erosion ($P < 0.001$). Postoperatively, five patients (15%) were dry and 4 (12%) were improved in group 1, whereas 15 (41%) patients in group 2 were cured and 13 (35%) improved. The success rates for collagen and male sling were 27% and 76%, respectively. There was a significant difference between two groups ($P < 0.05$).

CONCLUSION

Our results demonstrate that patients who undergo male sling placement for mild to moderate incontinence are more likely to be completely continent and also have a much higher rate of improvement compared with patients treated with collagen injections. However, further studies are needed to define long term success.

P048

Sling surgery for stress urinary incontinence: feasibility and safety of a day-case approach

S.K. GIRI*, J. MAC DONALD*, J.P. HICKEY*, H.P. REDMOND†, J. DRUMM* and H.D. FLOOD*
**Regional Hospital and NIHS, University of Limerick, Ireland; †University College Hospital, Cork, Ireland*

AIM

To assess in a prospective fashion the feasibility for discharge at 10 h following xenograft (Pelvicol) pubovaginal sling procedure.

MATERIALS AND METHODS

Between June 2003 and November 2003, 30 consecutive patients with stress urinary incontinence (SUI) were enrolled prospectively. Patients were admitted with a planned overnight stay and returned to the ward after operation without urinary catheter. Patients were assessed at 4, 10 and 24 h postoperatively. Time interval to first spontaneous void (TIFV), emptying efficiency (EE) and suitability for discharge were assessed. The EE was calculated as EE = VV × 100/ VV + PVR %; VV = voided volume, PVR = post void residual. Patients were considered ready for discharge from hospital when EE was >= 75% or when self-catheterizing confidently.

RESULTS

The mean TIFV was 7.1 h (median 6, 95% CI = 5.2–8.5). The mean EE at 10 h was 65.5% (median 60%, 95% CI = 56.8–76.2 %). Twelve patients (40%) achieved EE >= 75% at 10 h and another 3 (10%) were able to perform self-catheterization. Thus, overall 15 patients (50%) would have been dischargeable at 10 h. Non-dischargeable patients were more likely to be older (>60years) and to have the Valsalva leak point pressure of <60 cm of H_2O.

CONCLUSIONS

These data show that 50% of patients are suitable for day-case sling surgery. Early postoperative emptying inefficiency and inability to perform self-catheterization are the main limiting factors. Careful patient selection based on age and urodynamic findings may improve the feasibility of day-case sling surgery.

P049

Prospective randomized trial of xenograft versus rectus fascia pubovaginal sling in the treatment of stress incontinence

S.K. GIRI, O. CLYNE, J.P. HICKEY, G. NARASIMHULU, J. DRUMM and H.D. FLOOD
Regional Hospital and NIHS, University of Limerick, Ireland

INTRODUCTION AND OBJECTIVE

The pubovaginal fascial sling operation has become the first line surgical treatment for stress urinary incontinence (SUI). We compared the early morbidity and longer term efficacy of the rectus fascia sling with that of the xenograft sling in the treatment of SUI.

METHODS

Between January 2001 and March 2002, 65 patients with SUI were randomly assigned to either rectus fascia sling (group 1, $n = 31$) or

xenograft sling (Pelvicol, group 2, $n = 34$). Mean age was 49 years. Minimum follow-up was 18 months (range 18–30). At follow-up each patient was evaluated by a blinded assessor. Outcome measures included postoperative visual analogue pain score (VAS) (0=no pain, 10=maximum pain), length of stay, postoperative complications, time to return to work, persistence or recurrence of SUI, urge symptoms and subjective improvement.

RESULTS

The groups were well matched for age, type of SUI and urge symptoms. The mean postoperative VAS was 6.18 in group 1 and 2.1 in group 2 ($P < 0.001$, Wilcoxon rank sum test). The mean length of stay was 4.9 days vs. 2.8 days ($P < 0.01$) and the mean time to return to work was 9.1 weeks vs. 4.5 weeks ($P < 0.001$) in group 1 and group 2 respectively. Overall SUI was cured or significantly improved in 26 patients (83.8%) in group 1 and 27 patients (79.4%) in group 2 ($P > 0.05$).

CONCLUSIONS

The xenograft sling offers significant reduction in early morbidity without compromising longer term efficacy when compared with the autologous rectus fascia sling.

P050

Are TVT polypropylene slings colonized by muscular fibres? A histopathological evaluation of resected tapes for voiding dysfunction

J.F. HERMIEU, M. TOUBLANC, B. LHOEST, V. DELMAS, V. RAVERY, L. BOCCON GIBOD and C. BICHAT
Clinique Urologique, Hopital Bichat, Paris, France

PURPOSE

Tension free vaginal tapes (TVT) made of polypropylene mesh are increasingly used in the treatment of female stress urinary incontinence (SUI).

It is claimed by the manufacturer that the tape will be over time colonized by muscular fibres which will add their own effect to the simple mechanical suspension of the distal urethra. This study was undertaken to check this hypothesis.

PATIENTS AND METHODS

15 consecutive patients submitted to a TVT for SUI and suffering from voiding dysfunction (obstruction/de novo urgency) were treated by tape resection, 6 to 40 month after implantation. The resected tapes were submitted to hispathologic evaluation using standard stain (HPS) and immunohistochemistry (Vimentin, Actin, CD8) to detect the presence of fibroblast and muscle fibres.

RESULTS

Fibroblast and macrophages were detected around the fibres of every tape in a quantity inferior to what is normally seen in foreign body inflammatory reaction. 13/15 tapes were colonized by muscular fibres considered to be rare to abundant with no special relationship between the duration of implantation and the number of fibres.

CONCLUSION

This study shows that indeed TVT meshes are colonized by muscular fibres and induce only a limited inflammatory reaction. This explains the good tolerance usually observed. The exact contribution of muscular fibres to the recovery of continence remains to be investigated.

P051

Single centre experience of the Monarc™ subfascial hammock for the treatment of female stress urinary incontinence (SUI)

G.H. URWIN and S. HEATON
York Hospital, UK

INTRODUCTION

The tension-free vaginal tape has become the most commonly used technique for the treatment of female SUI. However, its blind needle passage has been associated with complications. The transobturator approach avoids the retropubic space and should result in decreased complication rates but with equivalent efficacy.

PATIENTS AND METHODS

Between April and December 2003, 48 patients with SUI were implanted with the Monarc™ subfascial hammock. Effectiveness

was evaluated objectively by physical examination, urodynamics, 1-h pad weight test and subjectively by patient-completed Urogenital Distress Inventory Short Form (UDI-6).

RESULTS

Mean age of patients was 55.6 years (range 33–84) 13 patients (27%) had undergone previous incontinence surgery. The mean operative time was 20 minutes and all patients went home without a catheter.

Patients used on average 3.9 pads/day preoperatively. Pad use decreased to 0.6 pads/day at 6 weeks and 0.4 pads/day at 3 months. Preoperative 1-h pad weight tests showed a mean pad weight of 69 g. Pad weight decreased to 4.3 g at 6 weeks and 3.9 g at 3 months. Mean UDI-6 scores were 70.1, 17.9 and 15.7 preoperatively, 6 weeks and 3 months, respectively. One urethral perforation was sustained and 3 patients developed *de novo* detrusor overactivity. 2 patients reported slight voiding difficulties at 3 months.

CONCLUSIONS

These early results demonstrate that the Monarc™ sub fascial hammock is an effective and safe operation in the treatment of female SUI and avoids the potential risk of vascular or intestinal injury particularly in patients who have had previous pelvic surgery. Further follow up however, is needed.

P052

Evaluation of the periurethral adjustable continence therapy (ACT™) device for the treatment of post prostatectomy incontinence. Results at 1 year

P.J. GILLING, D. BELL, K.M. KENNETT, A.M. WESTENBERG and M.R. FRAUNDORFER
Promed Urology, Tauranga, New Zealand

INTRODUCTION AND OBJECTIVES

The adjustable continence therapy (ProACT™) device has been designed to provide extrinsic compression of the membraneous urethra. It consists of two contralateral balloons each placed periurethrally, and attached via a conduit to a subcutaneous port placed in the scrotum. This enables postoperative balloon adjustment. We aimed to assess the efficacy of this device in the treatment of post-prostatectomy incontinence.

MATERIALS AND METHODS

16 post radical prostatectomy (8 perineal and 8 retropubic) and 7 post transurethral prostatic resection or holmium enucleation patients have been enrolled and treated to date. Subjective and objective parameters including the Incontinence Quality of Life questionnaire (I-QoL) and pad usage were measured at baseline and followed up at 1, 3, 6 and 12-month intervals. Urodynamics studies were conducted at baseline and at 6 months. Perioperative data, number and volume of adjustments and adverse events were also recorded.

RESULTS

9 of 14 patients were either cured or significantly improved at 3 months. No difficulties were encountered with balloon placement and there were no perioperative complications. Mean OR time was 27 (13–48) min. I-QoL scores increased from a mean of 51.8 (13.6–94.3) at baseline to 82.4 (29.5–96.6) at 12 months, representing a significant improvement. Pad usage dropped from a mean of 2.9 (1–12) at baseline to 0.28 (0–1) at 12 months. 13 out of 20 patients required a one time balloon adjustment and 7 out of 20 required a secondary adjustment, one required no adjustment. Two patients did not respond, and had an AUS placed. There were 3 infections necessitating implant removal.

CONCLUSIONS

Most patients (80%) are cured or have a significant improvement following ACT device placement for post-prostatectomy incontinence.

Wednesday 23 June 09.30–10.30
Poster Session 6: Penile Cancer and Erectile Dysfunction
Chairmen: I. Eardley and N. Watkin

P053

Conservative surgery for penile cancer

O. KAYES, P.K. HEGARTY, A. FREEMAN, N. CHRISTOPHER, D.J. RALPH and S. MINHAS
Institute of Urology, London, UK

INTRODUCTION

Penile amputation has marked psychological, functional and cosmetic effects. More conservative measures include glans excision with split skin graft, partial glans excision, or partial penectomy. The aim of this study was to assess the oncological control, sexual/urinary function and cosmesis following organ-preserving surgery.

PATIENTS AND METHODS

Between May 2001 and December 2003, 43 men underwent surgery for penile cancer of which 30 cases had conservative surgery. All patients were staged preoperatively by MRI with intracavernosal prostaglandin injection. Final histological diagnoses were 8 grade 1, 6 grade 2, 16 grade 3, with stages T1 in 14 cases, T2 in 12, and T3 in 4. Any case with a positive surgical margin had repeat surgery. All cases were followed up for cancer recurrence, cosmesis and function. Mean follow-up was 11 months (range 1–31 months).

RESULTS

Of the 30 cases, 3 (10%) had a positive surgical margin and underwent further surgery. In the follow-up period, 2 cases (7%) had tumour recurrence (one G3T1 treated by local excision, the other G3T3 by partial penectomy). Regarding cosmesis 89% were satisfied with the appearance. All men were able to void in the standing position. Eighty percent had erections, with 45% engaging in sexual intercourse. Overall 91% of men were satisfied with the surgical result.

CONCLUSION

Conservative surgery for penile cancer does not compromise oncological control, while maintaining cosmesis and function. These outcomes result in a high rate of satisfaction for men with penile cancer.

P054

Outcome after partial penectomy and glanuloplasty for penile cancer

T.J. DORKIN*, N. SHEIKH*, G.S. RAO† and D.R. GREENE*
**Department of Urology, City Hospitals Sunderland NHS Trust; †Department of Plastic Surgery, University Hospital of North*

AIM

To evaluate the outcome following partial penectomy and glanular reconstruction, using a split skin graft (glanuloplasty), for penile cancer.

PATIENTS AND METHODS

The study included 8 patients (median age 60 years, range 50–66) treated between 1999 and 2003. A semi-structured interview was conducted with patients to ascertain voiding and sexual function postoperatively; information was available from 7 patients.

RESULTS

Clinically, 5 tumours were confined to the glans, 2 involved the glans and prepuce and 1 involved the glans and distal shaft of the penis. Four patients underwent glansectomy only and 4 patients underwent amputation of the glans and distal corpora (1 −1.5 cm). Pathological staging was as follows: CIS ($n = 1$), pT1 ($n = 6$) and pT2 ($n = 1$). During follow-up (median 22 months, range 2-47), 2/8 (25%) developed recurrent disease. One patient developed meatal stenosis; the remaining patients described satisfactory voiding function. Five patients (83.3%) had normal erectile function, 1 patient partial erections and 1 patient had absent erections preoperatively. Four (4/6; 66.7%) patients enjoyed satisfactory intercourse with normal ejaculatory function. Intercourse was not satisfactory for 1 patient because of short

penile length and for the 1 patient with partial erections. All patients were satisfied with the cosmetic appearance of the penis.

CONCLUSIONS

Partial penectomy and glanuloplasty for penile cancer gives a satisfactory cosmetic result and should be considered as an alternative to conventional partial penectomy. Potency, sexual function and voiding function are preserved in the majority of patients.

P055

A contemporary experience of penile cancer at a regional referral centre

Z. HUSSAIN and P. WHELAN
St. James's University Hospital, Leeds, UK

INTRODUCTION

Penile cancer is a rare condition, with an incidence of 1.5 per 100 000 per year the average urologist would see perhaps one case every year. In order to concentrate these cases and the expertise to manage them, our institution was made the regional referral centre for penile cancer in 1999. We compare this to the subsequent guidelines published by NICE in September 2002 on the management of penile cancer.

METHODS

A retrospective review of cases managed at our institution over a period of 10 years (1994–2003) was performed. Information was collected from case notes regarding referral details, initial assessment and subsequent management. The duration of follow-up and survival was also recorded.

RESULTS

Fifty-six cases were identified of which more than three-quarters were seen within 2 weeks of referral. The mean age of the patients was 65 years (range 39–86 years) and approximately half had palpable inguinal lymph nodes at initial assessment. The median follow-up period was 22 months (range 1–93 months). Nineteen patients have died during follow-up (34%). We compare our practice with the subsequent NICE recommendations for Penile Cancer multidisciplinary teams (Table 1) and audit measurements that should be performed by them (Table 2).

CONCLUSION

The management of rare conditions such as penile cancer has increasingly become centralized in order to improve patient care and develop expertise in the field. It is important to have a clear and simple referral process and to collect data prospectively to achieve this and aid resource planning.

TABLE 1 Criteria for Penis Cancer MDTs

NICE Recommendations (Sept 2002)	Our Regional Referral Centre (1999)
1. Consist of two to four neighbouring networks	[tick]
2. Serve a population of four million or more	[tick]
3. Expect to manage a minimum of 25 new patients each year	[tick]
4. Have access to expertise in plastic surgery	[tick]
5. Agree referral protocols for patients with penile cancer	[tick]
6. Each new case is reviewed by a specialist Penis Cancer Team	[tick]
7. Penis Cancer MDT should remain responsible for overall management	[tick]
8. The choice of treatment be discussed with the patient in a meeting that includes a surgeon, clinical oncologist and specialist nurse	[tick]

TABLE 2 NICE recommendations for audit measurements

NICE Recommendations (Sept 2002)	Our Regional Referral Centre (1999)
Structure	
Systems to ensure that patients are promptly referred to a penile cancer MDT	[tick]
Effective links between the penile cancer MDT and local MDTs which may provide treatment for these patients	[tick]
Availability of appropriate expertise in penis reconstruction	[tick]
Process	
Evidence that patients are fully informed and involved in decision-making about treatment	[tick]
Use of lymph node dissection in patients at high risk of lymph node metastasis	[tick]
Outcome	
Five-year survival rates for all patients, with information on cancer grade and stage, co-morbidity, age and other features of case-mix	[tick]
In progress	
Audit of short-term and long-term adverse effects of treatment	[tick]

P056

Are current European Association of Urology (EAU) Guidelines accurate in predicting nodal disease in penile cancer?

P.K. HEGARTY, O. KAYES, M.C. PARKINSON, A. FREEMAN, D.J. RALPH and S. MINHAS
Institute of Urology and Nephrology, London, UK

INTRODUCTION

The EAU Guidelines for penile cancer indicate inguinal lymphadenectomy for patients with impalpable lymph nodes (LN), but deemed to be at high risk (> pT2 or G3) or of intermediate risk (pT1G2 with unfavourable histology). Traditionally for patients with palpable LN, treatment with antibiotics and reassessment is recommended. The incidence of LN metastasis in these three groups was assessed.

PATIENTS AND METHODS

Between June 2001 and December 2003, 43 men with penile cancer were seen at a single institution. Fifteen men had impalpable nodes, but were in the EAU high risk group, none were of intermediate risk group, and 10 had palpable lymph nodes (1 grade 1, 3 grade 2, 6 grade 3; 4 pT1, 5 pT2, 1 pT3, 5 with lymphovascular invasion). 44 superficial modified/radical lymphadenectomies were performed consecutively for these 25 men.

RESULTS

Positive LN were present in 33% (15/44) of lymphadenectomy specimens. Men with impalpable nodes had 13% (2/15) LN metastasis, whereas 80% (8/10) of those with palpable nodes were LN positive. Five out of six (83%) patients with lymphovascular invasion had positive LN metastasis. No patients in the low risk group have developed LN metastasis at follow-up (mean 18 months, range 5–23 months).

CONCLUSIONS

Patients with palpable nodes on presentation have a high incidence of metastatic disease and should not be delayed by antibiotic treatment but undergo prompt lymphadenectomy. Of patients with impalpable LN undergoing lymphadenectomy according to the EAU Guidelines, only 13% had positive nodes and therefore likely to benefit. This latter group should be the target of research to identify more accurate prognostic markers of metastasis.

P057

The efficacy and safety of tadalafil in a European population of men with erectile dysfunction (ED)

K.K. SETHIA
Norfolk and Norwich University Hospital, UK

INTRODUCTION

Tadalafil (Cialis®) is a long-acting phosphodiesterase-5 inhibitor for use in the treatment of ED. This multi-centre, double-blind, parallel-group, placebo-controlled study evaluated the efficacy and safety of tadalafil in men with mild to severe ED.

PATIENTS AND METHODS

After a 4-week run-in period, 220 men (80% with ED of >12 months duration) were randomized to receive either placebo or tadalafil 20mg, as needed, for 12 weeks. Primary endpoints were the change from baseline in IIEF erectile function (EF) domain scores and responses to SEP questions 2 and 3. Additional endpoints included change in baseline IIEF EF domain score according to ED severity and response to the global assessment question (GAQ).

RESULTS

At baseline, the mean IIEF score was 13.5. After 12 weeks, subjects who had taken tadalafil reported a mean increase in baseline IIEF EF domain scores of 11.1 compared with 0.4 for subjects who had taken placebo ($P < 0.001$). Changes in baseline IIEF EF scores were greater in patients with moderate and severe ED receiving tadalafil than the same groups receiving placebo (13.2 and 14.3 versus 1.69 and 0.7 respectively). Men taking tadalafil had significantly more successful sexual intercourse attempts than those taking placebo (75% versus 33%; $P < 0.001$). After 12 weeks, 82% of subjects who had taken tadalafil reported improved erections compared with 23% of those who had taken placebo. No treatment-related serious adverse events were reported.

CONCLUSION

Tadalafil 20 mg was well tolerated and significantly improved erectile function compared with placebo in men with ED regardless of severity.

P058

Oral tadalafil (CIALIS) in men with erectile dysfunction: a prospective study to evaluate the efficacy, safety and patients' preference

M. HAMMADEH, Y. KWONG, R. DADSWELL, G. FOWLIS and J. MCDONALD
North Middlesex University Hospital, London, UK

INTRODUCTION

Tadalafil has recently been introduced as an effective, long acting oral treatment for male erectile dysfunction (ED). We performed a prospective study to evaluate the efficacy and safety of Tadalafil in a busy general district hospital. Also we assessed patient preference for Sildenafil or Tadalafil in patients who were using Sildenafil successfully.

PATIENTS AND METHODS

91 consecutive patients with ED (mean age 58 years ± 13) were recruited, 33 of them have used Sildenafil successfully previously. All patients underwent IIEF questionnaire (questions 3, 4 and 14) and global efficacy question. Patient preference for Sildenafil or Tadalafil was assessed using the Treatment Preference Questionnaire (TPQ). The patients were initially given 10 mg Tadalafil (4 tablets), to use at home with the instructions to increase the dose to 20 mg depending on the response. All patients were reviewed at 4 and 8 weeks.

RESULTS

The mean duration of ED was 36 months ± 45, and the aetiologies were organic in 62 patients (68 %), unknown in 26 (29%) and psychogenic in 3 (3%). Following the treatment, 68 (75%) had good erections sufficient for penetration, which was maintained over the follow up period. The mean Tadalafil efficacy duration was 24 hours ± 10. Of 25 patients who had good response to both Sildenafil and Tadalafil, 23 (94%) preferred to continue on Tadalafil. Side effects occurred in 9 patients (10%).

CONCLUSION

Oral Tadalafil significantly improved the quality of erection and sexual satisfaction in most of our patients with ED with good tolerability. Tadalafil was preferred to Sildenafil in most of our patients who tried both treatments.

P059

An evaluation of patient preference for tadalafil versus sildenafil in men with erectile dysfunction (ED)

S. HOLMES
St Mary's Hospital, Portsmouth, UK

INTRODUCTION

Sildenafil (Viagra®) and tadalafil (Cialis®) are phosphodiesterase type 5 inhibitors used to treat erectile dysfunction (ED). Many men (20–50%) who show improved erectile function with sildenafil discontinue its use, suggesting that treatment for ED requires improvement. This study evaluated patient preference for sildenafil or tadalafil.

PATIENTS AND METHODS

In the primary treatment arms, 219 men were randomized to tadalafil (20 mg) or sildenafil (50 mg) for 12 weeks, then crossed-over to the alternate treatment for 12 weeks. Following these treatments, patients made a blinded choice of the treatment they would like to receive in the extension phase. Another 46 patients were randomized to the secondary arms to receive tadalafil 20 mg administered according to either tadalafil or sildenafil dosing instructions.

RESULTS

Of the 181 patients remaining in the study, 73% chose to receive tadalafil over sildenafil (27%) during the extension phase ($P < 0.001$). In the secondary arms, 67% of the 36 patients remaining chose to receive tadalafil with its own dosing instructions during the extension phase ($P = 0.046$) i.e. effective from 30 minutes to 24 hours after dosing and with no food restrictions. Sub-group analysis showed similar rates of preference for tadalafil in patients with diabetes, hypertension, cardiovascular disease and those with and without prior sildenafil experience.

CONCLUSION

Tadalafil has a broad window of therapeutic response enabling patients to achieve intercourse up to 36 hours after dosing. This may explain why patients preferred tadalafil to sildenafil for treatment of ED. Similar studies examining patient preference for tadalafil compared with different doses of sildenafil are ongoing.

P060

A prospective study using sublingual apomorphine (Uprima) alone and in combination with sildenafil (Viagra) in sildenafil non-responders

J.S. KALSI, A. MUNEER, P. KUMAR, D.J. RALPH and S. MINHAS
The Institute of Urology, London, UK

INTRODUCTION

Sildenafil is an efficacious treatment for erectile dysfunction (ED). However, up to 20–30% of patients may fail to respond. The aim of this pilot study was to evaluate the efficacy of sublingual apomorphine (Uprima) alone and in combination with sildenafil in the treatment of Sildenafil non-responders.

METHOD

94 patients were referred as sildenafil non-responders. After treatment optimization only 54 were genuine sildenafil non-responders. Failures were defined as having no benefit over baseline after taking 8 tablets of 100 mg sildenafil over 8 weeks. Genuine non-responders were instructed to take 8 tablets of apomorphine (3 mg) over 8 weeks. After an 8-week washout period patients took a combination of 8 tablets each of apomorphine (3 mg) and sildenafil (100 mg). The International Index of Erectile Dysfunction (IIEF) questionnaire was used to assess the efficacy of treatment.

RESULTS

48 patients completed the first phase of the trial, whilst 26 patients completed the combination study. Significant improvements in the erectile function domain score (baseline 12.5) to both apomorphine alone (16.7) ($P < 0.05$ vs baseline) and a combination of sildenafil and apomorphine (19.7) ($P < 0.05$ vs apomorphine alone) were seen. Similar improvements were also seen in the total IIEF scores. No patients discontinued treatment due to adverse events.

CONCLUSION

Optimization of sildenafil use may reduce the number of patients labeled as 'sildenafil failures'. Sublingual apomorphine used in combination with sildenafil may be safely and effectively used in the treatment of patients who have failed to gain benefit from sildenafil.

P061

Carrying short acting nitrates is not a contraindication to PDE5 inhibition

E.K. MARTIN, A. COOPER, E. MCGING and G. JACKSON
Guy & St Thomas, NHS Trust, London

INTRODUCTION

Phosphodiesterase Type 5 (PDE5) inhibitors are an effective and well tolerated treatment for erectile dysfunction (ED). Health care professionals are reluctant to prescribe PDE5 inhibitors for cardiac patients who carry short acting nitrates (SAN) because of the potential for an adverse interaction.

AIMS AND METHODS

To identify how SAN are used, and how with appropriate counselling patients carrying SAN may be eligible for PDE5 inhibitors.

Patients attending a cardiac/ED clinic over a 32-month period were assessed according to their risk status, medical history and medication. All eligible patients were commenced on a PDE5 inhibitor including those patients who owned a SAN. Patients were given counselling about how to manage these medications and how to manage angina up until the established nitrate interaction period was over. (Sildenafil 12 h, Tadalafil 48 h).

RESULTS

224 (78%) patients attending the clinic were stratified as low risk on initial assessment. 104 (46%) of these patients owned or carried a SAN. 74 (71%) of these patients were eligible for a PDE5 Inhibitor. 58 (78%) chose a PDE5 inhibitor. SAN use was: never 37 (64%), occasionally 11 (19%), monthly 7 (12%), and weekly 3 (5%). At follow up no ischaemic events/adverse effects were reported. There was no increase in the use of a SAN.

CONCLUSIONS

All cardiac patients must be stratified as low cardiac risk prior to ED treatment. Patients who own/carry a SAN may never or rarely use it. Patients carrying a SAN may be unnecessarily denied the benefits of a PDE5 inhibitor.

P062

Successful withdrawal of long-acting nitrates to facilitate phosphodiesterase type 5 inhibitor use in cardiac patients with erectile dysfunction

G. JACKSON, E. MARTIN, E. MCGING and A. COOPER
Guy' & St Thomas' Hospital

INTRODUCTION

Vascular disease is the commonest cause of erectile dysfunction (ED) in men. Phosphodiesterase type 5 (PDE 5) inhibitors are contraindicated in the presence of oral nitrates. Oral nitrates are frequently prescribed for patients with angina pectoris, many of whom have ED. Nitrates have no prognostic value and are only mild anti-anginal agents so we hypothesized that they could be discontinued or substituted to allow for oral PDE 5 therapy in men with ED.

METHODS

288 men with ED and cardiac disease attended a dedicated Cardiac Sexual Advice Clinic. 58 (20%)were taking oral nitrates. All were stable patients taking other conventional anti-ischaemic agents in addition. Oral nitrate therapy was discontinued in 30 (52%) men who were then reassessed one week later when an exercise ECG was performed.

RESULTS

Of the men who discontinued nitrate therapy two restarted oral nitrates. There were no acute events. Amlodipine was substituted in four patients. After a satisfactory exercise test (>4 minutes of the Bruce Treadmill protocol) all were prescribed sildenafil or tadalafil after detailed counselling. ED therapy was successful in 88%. There were no cardiac adverse events as a result of PDE 5 therapy with sildenafil or tadalafil.

CONCLUSION

Oral nitrate therapy can be safely discontinued in carefully selected cardiac patients to allow successful ED treatment with PDE 5 inhibitors.

Wednesday 23 June 11.00–12.00
Poster Session 7: Role of Imaging in Urology
Chairmen: P. O'Reilly and P. Taylor

P063

Improving selection of prostate cancer patients for bone scans: P1NP is a potential predictor and prognosticator of bone metastases

R. THURAIRAJA*, K. JEFFERSON*, R.K. ILES† and R. PERSAD*
**Bristol Royal Infirmary, Bristol; †Williamson Laboratory, St Bartholomew's Hospital, London, UK*

INTRODUCTION

To ascertain the reliability of a biochemical serum marker amino-terminal propeptide of type I procollagen (P1NP) in predicting bone metastases to improve selection for bone scans and prognosticating disease progression and survival in patients with prostate cancer.

PATIENTS AND METHODS

Between January 1999 and July 2001, patients with biopsy proven prostate cancer requiring bone scans were recruited. Serum P1NP was measured using the Orion Diagnostica radio-immunoassay kit and compared with bone scan findings. After 2 years, case notes were reviewed to identify skeletal morbidities and mortality.

RESULT

36 patients aged from 53 to 87 years (mean = 70) were recruited into the study. PSA at diagnosis ranged from 0.8 to 2012.6 ng/mL (mean = 128.1). There were 24 negative, 7 positive and 5 equivocal bone scan findings. Mean P1NP for patients with negative scans were 40.1 ± 12.4 ng/mL. Mean P1NP for bone scan positive and equivocal patients were 183.1 ng/mL and 79.1ng/mL respectively. In the group with positive and equivocal scans, mean P1NP for patients with and without bone symptoms were 164.4 ng/mL and 65.9 ng/mL respectively ($P < 0.05$). Mean P1NP for patients from this group who died was 177.7 ng/mL compared to 64.0 ng/mL for the surviving patients ($P < 0.05$).

CONCLUSION

Though isotope bone scan is the 'gold standard' modality for identifying bone metastases in prostate cancer, it is expensive and time-consuming. As shown from these results, serum P1NP is a reliable predictor that may help to reduce the dependency on bone scan requirements and may offer improved prognostic information in prostate cancer.

P064

Antegrade ureteric stenting: rationale of procedure for the management of obstructive uropathy in pelvic malignancies

N. SHEIKH, K. NEELAGIRI, A. HILDRETH, R. MARSH and D. GREENE
Sunderland Royal Hospital, Sunderland, UK

INTRODUCTION

Cancer of the pelvic organs often causes supracystic urinary tract obstruction. Urologists commonly face the difficult question of whether or not they should proceed to relieve the obstruction, and if a decision is made to proceed then which is the optimal procedure for the given situation. Considering the advanced state of malignancy and poor health status of the patient due to significant uropathy the least invasive procedure would be the one of choice.

Antegrade ureteric stenting is one of the commonly performed procedures in these situations and the outcome of this choice has been evaluated.

METHOD

During the period between 1994 and 2002, 103 patients underwent standard percutaneous nephrostomy (PCN). All patients subsequently had antegrade stenting, either at the same time as nephrostomy or at a later date when the patients' condition had improved.

RESULTS

103 patients had 181 stents inserted. 15 (14.5%) out of 103 patients had simultaneous PCN and antegrade bilateral stenting. 65 (63%) had delayed bilateral stenting, 21 (20.3%) had unilateral stenting and 2 (2%) failed stenting.

Primary pathology included: bladder cancer 36 patients (35%), prostate cancer 27 (26%), cervical cancer 20 (19.5%), colorectal cancer 11 (10%), ovarian cancer 6 (6%) and uterine cancer 3 (3%).

Mean survival following the procedure was: bladder cancer 216.2 days, prostate cancer 203.9 days, cervical cancer 324 days, colorectal 121.5 days, ovarian cancer 164.7 days and uterine cancer 21.3 days.

CONCLUSION

In general bladder, prostate and cervical cancer patients had better survival, than ovarian, colorectal and uterine cancer patients. Antegrade stenting is a procedure performed under local anesthesia and is minimally invasive. It is a more acceptable procedure from both the patient's and carer's view point.

P065

Imaging of urethral strictures: the value of urethral ultrasound compared with urethrography

T. WAH, D.E. ANDRICH, T.J. GREENWELL, D. RICKARDS and A.R. MUNDY
Institute of Urology, Kingston upon Thames, Surrey, UK

INTRODUCTION

Urethral strictures are traditionally investigated by urethrography. Ultrasound (US) has been introduced in the assessment of urethral strictures with the benefit of avoiding exposure to radiation.

MATERIAL AND METHODS

In a comparative study 28 male patients aged 22-76 (median 44) with various urethral strictures - 8 penile (1 idiopathic, 3 iatrogenic, 3 hypospadias, 1 BXO), 14 bulbar (12 idiopathic, 1 iatrogenic, 1 traumatic) and 6 bulbomembranous pelvic fracture defects - underwent urethrography and transperineal US (12 MHz linear array probe). The urethral lumen was distended with 0.9% normal saline and the length of the stricture on US defined as the extent of spongiofibrosis, whereas on urethrography it was defined as the extent of visible narrowing. Local stricture complications were documented and compared with each other.

RESULTS

Urethral stricture location is equally well assessed with urethrography and US. Stricture length of anterior strictures appeared longer on US by 21% (0–150%). Depth of spongiofibrosis can only be assessed with US. The average depth for penile strictures was 6.1 mm (3–9 mm), for bulbar strictures 6.6 mm (3.5–10.4 mm) and 8.6 mm (5–10 mm) for bulbomembranous distraction defects. The proximal extent was not well seen in the latter on US and was better seen with urethrography. Stricture fistulation or false passages were better demonstrated on urethrography but diverticula or stricture segmentation was almost equally well seen on US.

CONCLUSION

Proximal distraction injury and fistulation are better demonstrated with urethrography but urethral US may be used to delineate the extent of spongiofibrosis.

P066

Radiation dose and exposure time are measures of surgical experience in percutaneous surgery

D.J. ALLEN, R. TIPTAFT and J. GLASS
Guy's Hospital, London, UK

INTRODUCTION

To investigate if length of operation, radiation screening time and radiation dose are useful measures of surgical experience when performing percutaneous nephrolithotomy (PCNL) and to identify how many cases need to be performed before reaching peak performance.

MATERIALS AND METHODS

Data on the mean operating time, screening time and screening dose on the first 60 consecutive patients undergoing PCNL by a newly appointed surgeon were recorded. Data on a subsequent cohort of 15 patients was also obtained to study if changes in performance were maintained. This was compared with data from 15 patients where PCNL had been performed by a surgeon with experience in percutaneous surgery.

RESULTS

Mean operating time, screening time and screening dose all decreased significantly between the first cohort of 15 patients and

cases 46–60 ($P < 0.021$, $P < 0.017$ and $P < 0.03$ respectively; Wilcoxon Signed Ranks test). Intra-operative parameters were similar to those of the senior surgeon in both the final cohort of the initial series (cases 46–60) and the latter cohort of cases (100–115).

CONCLUSIONS

It takes 46–60 PCNLs for a novice surgeon to achieve operative length, radiation dose and screening times similar to those of an experienced surgeon. Improvement appears to plateau after 60 cases. Radiation dose and screening times are useful markers of increasing experience in percutaneous surgery and this may apply to other procedures where radiation is utilized.

P067

Radiation exposure and the urologist: What are the risks?

G.O. HELLAWELL*, G. THEVENDRAN*, S. MUTCH† and R.J. MORGAN*
**The Royal Free Hospital, London; †The Churchill Hospital, Oxford, UK*

INTRODUCTION

Endourology is established in urology practice with routine use of fluoroscopic guidance. The urologist is rarely exposed to direct radiation exposure but secondary exposure occurs via radiation scatter. Radiation exposure of medical personnel involved in urological procedures often occurs without monitoring and with little reported data on risk to the personnel.

PATIENTS AND METHODS

We measured radiation exposure during endourologic procedures using lithium fluoride thermoluminescent dosimeters (TLDs) placed at the head, fingers and legs of the operating surgeon, the assistant and the circulating nurse. An estimation of radiation exposure to the operating surgeon was made based upon average screening exposure time and surgeon position.

RESULTS

Ten procedures have been monitored with a further thirty procedures scheduled. Average screening time was 1.7 min with an exposure rate of 78 Kv, 2.4 mA. The estimated scatter exposure rate at 40 cm from the X-ray beam was 0.64 microGy/second which gives a total dose to the face of the operating surgeon of 65 microGy for each procedure. Confirmation of this dosage will be provided from the TLDs which will also give data for dosage to the assisting surgeon and circulating nurse.

CONCLUSION

Fluoroscopic screening results in radiation exposure of the urologist through radiation scatter. A total dosage of 65 microGy per procedure results in a typical annual exposure of 6.5 microGy for a urologist carrying out regular routine endourological procedures. Urologists should be aware of radiation risks and undertake to minimize their radiation exposure and the personnel involved in fluoroscopic screening procedures.

P068

Does primary care open access to a urology ultrasound service streamline outpatient referrals?

S.A.K. MAMPITIYA, T. THORNE, A. PHILIPS and S. GUJRAL
Barking Havering and Redbridge NHS Trust, Haroldwood Hospital, UK

INTRODUCTION

A diagnostic and treatment centre (DTC), which includes a radiographer-run ultrasound service, operates in our department. Referrals are both from primary and secondary care. This service was set up to streamline the patient's diagnostic and treatment pathway.

METHODS

Details of 1000 consecutive referrals to this service were collated and analysed retrospectively.

RESULTS

Ultrasound scans were reported as normal in 859 (85.9%) patients. Forty one patients were found to have urological disease; 1 had a renal cell carcinoma (proven on CT scan), 15 had a space occupying lesion in the bladder requiring cystoscopy and resection, 6 had severe hydronephrosis requiring further

investigation, 19 had urolithiasis requiring further imaging. One hundred patients had non urological disease; 11 females were found to have an adnexal mass requiring urgent gynaecology referral, 14 had significant abdominal aortic aneurysms, 16 had hepatic anomalies including 3 patients with liver metastases, 59 had gall stones, with only a small minority being symptomatic.

CONCLUSION

An open access urological ultrasound service significantly reduced inappropriate outpatient referrals. Significant numbers of patients with unsuspected urological malignancy were fast tracked for treatment. 15% of patients were found to have significant non-urological disease, which was effectively triaged to other specialities.

P069

Can patients selection be improved for retrograde balloon dilatation of pelviureteric junction obstruction?

G. NABI*, J. HUSSEY†, J. N'DOW* and S. MCCLINTON‡
**Academic Urology Unit, Aberdeen Royal Infirmary; †Department of Radiology, Aberdeen Royal Infirmary, ‡Academic Urology Unit, Aberdeen Royal Infirmary, UK*

INTRODUCTION

To investigate what factors are predictive of failure after retrograde balloon dilatation in the management of pelviureteric junction obstruction.

PATIENTS AND SELECTION

136 patients underwent retrograde balloon dilatation of pelviureteric junction obstruction between 1986 to 2003. We studied all patients who had failed retrograde balloon dilatation and subsequently had an open surgical correction of their PUJ obstruction. Ages, sex, presenting complaints, side of obstruction, pre-procedural renal functions, findings of open surgical procedure were noted. Patients were meticulously followed up.

RESULTS

Thirty-three out of 136 patients (24.2%) failed to improve symptomatically and were obstructed on diuretic renogram. These patients underwent open surgical correction including open pyeloplasty in 27 patients, nephrectomy in four, one had pyeloplasty with autotransplantation and one had pyeloplasty and nephropexy. In pyeloplasty group, 15 (55%) patients were found to have crossing vessels, 2 high insertion of ureters, 6 with giant hydronephrosis and redundant pelvis and 2 with extensive fibrosis around kidney. All four patients in nephrectomy group had poor pre-balloon dilatation renal functions (less than 25%). One patient with associated renal ptosis required open nephropexy in addition to pyeloplasty. Four patients required repeat balloon dilatation following pyeloplasty. On a mean follow up of 96 months, 2 (6.89%) patients in pyeloplasty group had further deterioration in renal functions despite repeat balloon dilatation and required nephrectomy. 93% of patients were successfully salvaged with open pyeloplasty with good long term results.

CONCLUSION

Retrograde balloon dilatation of pleviureteric junction obstruction is an effective minimal invasive treatment modality. Patients with crossing vessels, high insertion of ureters, grossly dilatated pelvis and renal units with less than 25% functions have poor outcome. Patients failing balloon dilatation can be successfully salvaged by pyeloplasty.

P070

Application of image registration on 3-dimensional transrectal ultrasound (3DTRUS) images for staging clinically confined prostate cancer – a novel method of automated prostate capsule detection

S.S. MEHTA, D.C. BARBER and F.C. HAMDY
Royal Hallamshire Hospital, Sheffield, UK

3DTRUS has improved diagnostic accuracy over other modalities for local staging of prostate cancer, but image interpretation relies on expertise, which permits interobserver variability. To overcome this we developed a novel method of automated prostatic capsule detection - the first step to completely automated staging.

3DTRUS was performed on 40men prior to radical prostatectomy. A skilled observer defined the 'gold-standard' prostatic capsule on each scan. We designed image

registration software to produce a reference image capsule from a set of 3DTRUS files. Each patient 3DTRUS image was registered to the reference image using non-linear mapping. The derived prostatic capsule was transferred to the patient image, generating an automated patient specific prostate capsule. This was validated using average linear displacement (ALD) where an ideal match is zero (i.e. no displacement).

A reference image was easily formed with 10 high quality scans. The automated boundary mapped well on all scans and allowed for artifact defects and anatomical distortion. The ALD of the automated capsule from the 'gold-standard' was 2.8 (+/–0.75) pixels, equating to 0.7 mm overall difference. The ALD, when coned to the posterior two-thirds of the gland, focusing mainly on the peripheral zone, was 2.4(+/–0.6) pixels, i.e. 0.6 mm difference.

A reliable, accurate, validated method of automated delineation of the prostatic capsule is possible using image registration of 3DTRUS images. Enhancement of 3DTRUS with image registration has the potential to further improve its capability. This automated capsule will further be analysed by rendering local values of image intensity, thereby automatically identifying areas of extracapsular extension, obviating potential subjective error.

P071

MR imaging of a prototype urethral sphincter: normal appearances and complications

S. READ*, M.A. HALL-CRAGGS*, D. RICKARDS*, S. KNIGHT†, A.R. MUNDY† and M.D. CRAGGS†
**Department of Radiology, University College Hospitals, London; †Institute of Urology, University College Hospitals, London, UK*

INTRODUCTION

A new prototype artificial urethral sphincter (AUS) has been designed which aims to reduce device complications by varying cuff pressure, increasing it only during periods of stress. The device is not radio-opaque and cannot be seen on CT or X-ray screening. We have used MR to image this new system, to show normal appearances, to investigate causes of device failure and to examine it under varying physiological conditions.

METHODS

The prototype AUS was implanted into 9 men with genuine stress incontinence. Post-operative continence was satisfactory in 8 patients but was never achieved in the ninth. Late failure of continence occurred in 1 patient following an episode of heavy lifting.

MR scans were performed on a 1.5T system, using Tru-FISP gradient echo, breath-hold sequences. Images were acquired in the coronal and sagittal planes in all cases. Additional images during a Valsalva manoeuvre and following cuff deflation were acquired in some.

RESULTS

The images of one patient were non-diagnostic due to surgical metal work in the pelvis. In patients with intact mechanisms, 2 intra-abdominal balloons, the scrotal pump and a distended cuff showing 1.5 turns is characteristically seen. The causes of failure in 2 patients were clearly shown as tube-cuff joint leak in one and cuff dehiscence in the second.

CONCLUSIONS

MR is a promising technique for imaging AUS devices. In this series, the normal appearances and causes of failure were clearly illustrated. Lack of ionizing radiation allows repeated use and the study of sphincter function under various physiological conditions.

P072

Planning PCNL using multidetector CT urography, multiplanar reconstruction and 3D reformatting

N. THIRUCHELVAM, H. MOSTAFID and G. UBHAYAKAR
Departments of Urology and Radiology, North Hampshire Hospital, Winchester, Hampshire, UK

INTRODUCTION

We assessed a modified technique of multidetector CT urography (CTU) which can reproducibly and accurately map the pelvicalyceal system (PCS) and complex renal calculi. Such information is essential in choosing the optimal percutaneous approach into the PCS that is the cornerstone of a safe and successful percutaneous nephrolithotomy (PCNL).

METHOD

10 consecutive patients with renal calculi underwent a modified 4-detector multislice CTU with frusemide administration, abdominal compression and subsequent contrast administration. After an unenhanced CT of the abdomen, a high resolution contrast enhanced CT scan taken through the kidneys in the pyelographic phase was performed. Data was analysed using multiplanar reconstruction (MPR) and 3D reformatting (3DR).

RESULTS

In 10 CTU's, there were: (i) 3 staghorn, 2 diverticular, 25 calyceal, 2 infundibular and 2 renal pelvic calculi; (ii) 9 showed posterior calyces and good infundibular anatomy and provided a good map of the PCS. Seven patients underwent PCNL: 5 had complete stone clearance, 1 required ESWL for an additional stone and 1 had an infundibular stone managed conservatively. Of the remaining three: 1 patient had primary ESWL and 2 patients were conservatively managed. CTU detected stones in all patients and accurately located their relation to the PCS. With reconstructed images, subjectively the 3-D imaging provided an advantage over conventional imaging in optimizing nephrosotomy placement.

CONCLUSION

This new modification to CT urography with MPR and 3DR provides a 3-D image of the pelvicalyceal system and, where necessary, its relationship to complex calculi. CTU enables accurate preoperative prediction of (a) percutaneous track placement; (b) number of tracks required; (c) complex pelvicalyceal anatomy.

Wednesday 23 June 11.00–12.00
Poster Session 8: Infertility and Andrological Surgery
Chairmen: D. Ralph and T. Terry

P073

The effect of human immunodeficiency virus on sperm parameters

J.D.M. NICOPOULLOS*, C. GILLING-SMITH*, P. ALMEIDA* and J.W.A. RAMSAY†
**Assisted Conception Unit, Chelsea and Westminster Hospital; †Charing Cross Hospital, London, UK*

INTRODUCTION

The improved life expectancy of HIV-positive men has led to an increased number seeking fertility advice. We have treated HIV positive men with 'sperm-washing' as part of a risk reduction program since 1999 and have performed the largest series of intrauterine inseminations (IUI) in such men in the UK. The aim of this study was to present the first UK data on the effect of HIV on sperm parameters.

PATIENTS AND METHODS

Semen characteristics were evaluated in 106 HIV-positive men (372 semen samples). Comparisons were made with a control group of HIV-negative men ($n = 234$) of similar age, partners of women requiring IVF because of tubal infertility over the same time period.

133 samples were used for IUI in the HIV positive men. The sperm parameters of these samples were also compared with a control group of IUI samples from HIV-negative men over the same time period ($n = 222$).

RESULTS

Ejaculate volume (3.3 mL vs 2.9ml: $P = 0.01$), sperm concentration (70.1 mill/mL vs 54.8 mill/mL: $P < 0.01$), total count (222.4×10^6 vs 147.1×106: $P < 0.01$), motility (66.1% vs 52.7%: $P < 0.01$), progressive motility type 'a' + 'b' (54.7% vs 48.5%: $P = 0.03$) and normal morphology (29.0% vs 23.3%: $P < 0.01$) were all significantly higher in the control group compared to the HIV positive men (Mann–Whitney U-non-parametric tests). Significant differences in volume, motility and morphology persisted when the IUI groups were compared.

CONCLUSION

All sperm parameters evaluated were significantly impaired by the presence of HIV infection. Samples used for IUI were also shown to be impaired in HIV positive men.

P074

Factors predicting outcome of testicular sperm extraction in subfertile men

P.K. HEGARTY, V. AGRAWAL, V. KULKARNI, A. FREEMAN, S. MINHAS and D.J. RALPH
University College London, UK

INTRODUCTION

Testicular sperm extraction (TESE) combined with ICSI may be used for the treatment of men with sub-fertility. The aim of this study was to determine the clinico-pathological factors predicting successful sperm retrieval in men undergoing TESE.

PATIENTS AND METHODS

144 sub-fertile men undergoing TESE were evaluated regarding the aetiology of their sub-fertility, testicular size and hormonal profile. The mean Johnson score (MJS) was determined from a biopsy performed at the time of sperm retrieval. Sperm retrieval rate (SRR) was calculated relative to these factors.

RESULTS

The overall SRR was 72%. SRR of 83% was achieved in men who had undergone vasectomy or had severe oligospermia due to chemotherapy/irradiation, as compared to 68% of those with non-obstructive azoospermia (χ test $P = 0.00019$). Testes less than 2 cm in length yielded sperm in 43%, with 100% retrieval in testes greater than 5 cm. Men with FSH more than twice normal had a SRR of 50%. There was a linear correlation between Mean Johnson score (MJS) and sperm recovery ($r = 0.83$). Men with either germ cell aplasia or Sertoli cell only syndrome had a SRR of 35%. A combination of testicular size >3 cm, normal FSH and MJS >7 had a positive predictive value of 98.6% for sperm retrieval.

CONCLUSION

A combination of favourable prognostic factors leads to a high SRR. However, sperm may still be successfully retrieved in men with small testes, raised FSH or reduced MJS. This has implications in counselling patients using testicular sperm for assisted conception.

P075

The role of surgery for penile dysmorphophobia and congenital micropenis

C.Y. LI, P. KUMAR, V. AGRAWAL, S. MINHAS and D.J. RALPH
Middlesex Hospital, London, UK

INTRODUCTION

Penile shortening can be both a subjective, or an objective diagnosis. The underlying pathology includes penile dysmorphophobia, congenital micropenis and Peyronie's disease. Penile dysmorphophobia (PD) is the commonest complaint. Various penile lengthening procedures have been described for the treatment of this problem; however, most with unsatisfactory results. The aim of this study was to assess the results of penile lengthening procedures including division of suspensory ligament.

MATERIALS AND METHODS

Patients who presented to a single unit requesting a penile lengthening procedure during 1998 to 2003 were included. Patients were treated with suspensory ligament division ± fat pad excision ± VY plasty ± insertion of silicon buffer ± alloderm graft, were reviewed.

RESULTS

A total of 25 patients underwent penile lengthening procedures. The mean preoperative penile length was 10.5 ± 2.4 cm. The mean increase in penile length was 1.1 ± 1.2 cm. Showing no significant increase (P-value = 0.19). The outcome was measured using patient satisfaction: 64% were dissatisfied with the procedure and 56% of the total proceeded to have subsequent surgery in order to enhance their penile length further. Of all those requesting further surgery, only 36% were eventually satisfied with their penile length.

CONCLUSION

Patients presenting with penile dysmorphophobia often have an unrealistic expectation of surgical outcome. Division of suspensory ligament and/or other augmentation techniques do not significantly increase penile length and are not a cure for PD. This together with the high postoperative rates of patient dissatisfaction should discourage surgery as a primary treatment for PD.

P076

Abnormalities of the penile suspensory ligament

C.-Y. LI, P. KUMAR, V. AGARWAL, N. CHRISTOPHER, S. MINHAS and D.J. RALPH
Institute of Urology, London, UK

INTRODUCTION

The function of the penile suspensory ligament is to support and maintain the erect penis in an upright position during sexual intercourse. This paper assesses the management of patients who presented with an abnormality of the suspensory ligament and subsequently had it repaired.

PATIENTS AND METHODS

Fifty-nine patients with a mean age of 28 years (range 14–51 years) were diagnosed with a suspensory ligament abnormality. The aetiologies were congenital ($n = 33$), following sexual trauma ($n = 14$), iatrogenic ($n = 11$) and following a pelvic fracture ($n = 1$). The presenting complaints were a penile curvature or torsion ($n = 47$), an unstable erect penis ($n = 12$) or erectile dysfunction ($n = 8$).

The diagnosis was made clinically, often by a palpable gap between the pubis and penis being present, and/or following a pharmacologically induced erection. The repair of the ligament was performed using 4 ethibond sutures inserted into the midline tunica and the symphysis pubis.

RESULTS

A good surgical result (correction of penile deformity / instability with normal sexual function) was obtained in 52 patients (88%). No improvement or persistent erectile dysfunction was present in 7 patients (12%). Overall 75% of patients were happy with the end result.

CONCLUSION

Abnormalities of the penile suspensory ligament usually present with complex and unusual penile deformities associated with a variable degree of sexual dysfunction. The diagnosis is made clinically and the simple repair usually successful.

P077

Long-term sexual satisfaction after correction of penile curvature for Peyronie's disease by Lemberger's procedure – a questionnaire-based study

A. D'SA, S. SRIPRASAD, Y. PASHA, A. ELLIOTT and I. DICKINSON
Department of Urology, Darent Valley Hospital, Kent, UK

INTRODUCTION

Although the correction of penile curvature for Peyronie's disease by Lemberger's procedure has acceptable complication rates, long term sexual function and patient satisfaction are not clear. The study aimed to evaluate this.

PATIENTS AND METHOD

A validated sexual function questionnaire was sent to 57 consecutive patients who had undergone Lamberger's modification of Nesbitt's procedure for Peyronie's disease. Patient notes were also reviewed.

RESULTS

Fifty-two of the 57 patients responded (91.2%). Median time since operation was 3.2 years (2,7) and the median age was 53.7 years. Erections improved in 28.8% of patients and remained the same in 50%. Twelve patients became worse (21.2%) and of these 10 of them were over 60 years. Penetration following surgery improved in 57.8%. There was perceived shortening of the penis (by the patient or partner) in 57% and in the remaining patients no change was noticed. Seventy-five per cent of patients did not report any penile numbness, whilst 11.5% reported numbness that did not interfere with sexual enjoyment and 13.5% noticed numbness interfering with sexual enjoyment. Only 46% of patients thought that the operation had fulfilled their perceived expectations.

CONCLUSION

The results indicate that after correction of penile curvature by the Lemberger's technique the majority of patients, even long- term, have better penetration and improvement in erections. However, as sexual function and expectations from this type of surgery are complex, the importance of a proper and detailed counselling cannot be overemphasized.

P078

The results of plaque incision and vein grafting (Lue Procedure) in the surgical correction of Peyronie's disease in 113 patients

J.S. KALSI, S. MINHAS, A. MUNEER, N. CHRISTOPHER and D.J. RALPH
Institute of Urology, London, UK

INTRODUCTION

The penile deformity associated with Peyronie's disease may be corrected by a Nesbit procedure, however this may result in penile shortening. The aim of this study was to assess the results of plaque incision with venous grafting in patients with Peyronie's disease.

METHOD

Penile deformity secondary to Peyronie's disease was corrected using the Lue procedure in 113 patients (mean age 44.9 years, range 17–71) between 1996 and 2003. All patients had stable disease for at least 1 year and penetrative sexual intercourse was difficult or impossible. Pre-operatively the mean (range) penile deformity was 64.5 (20–180)°. The stretched penile length was recorded before and after surgery in all patients.

RESULTS

Post- operatively the penis was straight in 97 patients (85.8%) (mean follow-up 8 months, range 1–67). 43 patients (38.1%) had additional perioperative procedures (40 requiring plication stitches and 3 a Combined Nesbit and Lue procedure) to straighten the penis. Postoperatively erectile function deteriorated in 10 men (8.8%). None of these patients reported complete loss of erection capability. Eighty patients (70.8%) reported no loss of length whereas 29 cases (25%) reported penile shortening of greater than 1 cm. Of these 29 cases, 12 had had additional plication sutures. Using set criteria the overall satisfaction rate (excellent or satisfactory) was 92.2%.

CONCLUSION

The Lue procedure successfully corrects the penile curvature associated with Peyronie's disease with a high patient satisfaction rate. However, there is also a significant risk of post-operative penile shortening and erectile dysfunction. Patients must be fully counselled pre-operatively with respect to this.

P079

Penile prosthesis for Peyronie's disease: results and complications

V. AGRAWAL, S. MINHAS, P. KUMAR, C. LI, A. MINERVINI and D. RALPH
Institute of Urology, London, UK

INTRODUCTION

A penile prosthesis is a treatment option for men with Peyronie's disease with associated erectile dysfunction (ED). This study was undertaken to evaluate the results and complications of penile prosthesis implantation in such patients.

PATIENTS AND METHODS

A retrospective review was conducted of men who underwent implantation of penile prostheses over a 24 year period. Patients included 52 men aged 32–72 (mean 55.6), who had a significant penile curvature with associated ED. A total of 58 prostheses were implanted in 52 men (6 patients had revision of the implant). The mean follow-up period was 41 months (1–199).

RESULTS

A malleable prosthesis was implanted in 40 (68.9%) men and inflatable in 18 (31.1%). Nine (15.5%) patients required additional procedures to straighten the penis including plaque excision, penile moulding, suspensory ligament repair/division and plication. Complications included infection in 3 (5.2%) patients and mechanical failure in 5 (8.6%), which required revision surgery. 3 other patients had revision of their prosthesis for deformity, short prosthesis and erosion. Straightening of the penis following implantation was achieved in 53 of 58 prostheses (91%). 45 (86%) patients were able to resume sexual activity. A satisfaction survey revealed 36 extremely pleased, 9 satisfied and 7 dissatisfied patients .

CONCLUSION

Patients with Peyronie's disease and associated erectile dysfunction can be effectively treated with a penile prosthesis. Surgery is safe and associated with a low morbidity, with a high satisfaction rate.

P080

Inflatable penile prostheses and modeling in severe Peyronie's disease with erectile dysfunction

M. CHAUDHARY, N. SHEIKH, S. ASTERLING and D. GREENE
Sunderland Royal Hospital, Sunderland, Tyne & Wear, UK

INTRODUCTION

Advanced Peyronie's disease with severe penile curvature and poor quality erections presents a challenge to the urologist. We retrospectively evaluated the impact of penile correction by modelling of the penis over inflatable penile prosthesis and improvement of erectile function.

MATERIALS AND METHODS

In our series, 36 patients with advanced Peyronie's disease and associated erectile dysfunction underwent penile modeling over a 3-piece inflatable AMS 700CX or Mentor Alpha 1 penile prosthesis as a standard modeling procedure (Wilson *et al. J Urol* 2001; **165**: 825–9) between 1998 and 2003. 20 patients had a Mentor alpha 1 and 16 patients had an AMS 700CX 3 piece inflatable penile prosthesis. Patients were evaluated postoperatively in the clinic as well as by a postal questionnaire.

RESULTS

34 patients were satisfied with the penile correction. None of the patients underwent re-operation for additional straightening. 2 (5.5%) patients had removal of prosthesis due to infection. They underwent revision surgery but later on their prostheses had to be removed, one had intractable pain and the other had erosion of the cylinder into the urethra. Both these patients were insulin dependent diabetics. 22 (64.7%) patients had an initial complaint of difficulty in pump deflation. Erectile function was significantly improved in 32 (94%) patients and 2 (6%) patients were unhappy with the outcome.

CONCLUSIONS

We conclude that patients with severe Peyronie's disease and erectile dysfunction should be offered the choice of modeling of the penis over an inflatable penile implant to correct the curvature as well as improve erectile function.

P081

Penile prostheses in erectile dysfunction – a long-term experience and outcome

M. NAIR, R. ABRAHAM, N. ALLEN and M. FOSTER
Good Hope Hospital, Sutton Coldfield, UK

INTRODUCTION

Penile prostheses is an accepted therapeutic option for the treatment of refractory erectile dysfunction of various causes. Since its invention in 1973, many follow up studies have been reported, but all were deficient either with poor response rates, small sample size or short follow up. Our study was designed in a longituidinal manner, addressing these issues and to provide information on how patients and their spouses coped with penile implants and functioned medically, sexually and psychosocially. Our longest period of follow up extended to over 10 years. We also uniquely analysed post prostheses orgasms.

MATERIALS AND METHODS

Using retrospective methods 60 patients with prostheses inserted by a single urologist at a single centre from 1992 to date were analysed. All patients had unsuccessfully used various forms of medical therapy (e.g. Caverject, Muse, Viagra).

Surgery was performed, after selection and appropriate counselling as an in-patient procedure under GA with antibiotic prophylaxis and overnight stay ,using peno-scrotal incision with a reservoir inserted into retro-pubic space, when appropriate. Patient satisfaction was assessed by a combination of mailed patient and spouse questionnaires, clinical records reviews and personal interviews and physical examinations.

RESULTS

68 prostheses were inserted in 60 patients. The median patient age was 55 years (26–78). 8 revision procedures, 3 following infection, 3 for mechanical failure and 2 from erosion were performed. Patients have been followed for between 3 and 121 months (mean 62). First 11 procedures were using malleable (AMS/Mentor),thereafter 3 piece inflatable (AMS700 in 14 and Mentor alpha 1 in 43) was used.

Our study obtained more than 90% response rates and found that 92 % are able to have

sexual intercourse, 84 % felt that the operation had been worthwhile, and 73 % were completely happy with their prostheses. 26 % expressed minor dissatisfaction at either the cosmetic appearance or the functional aspects of their prosthesis (or both, of which 18% had issues with penile size), however only 10% regretted having surgery of which 7% were due to pain during intercourse, and only less than 2% were unable to have sexual intercourse. 60% had normal orgasms and another 18% agreed their orgasms had improved. Infection rate at 5%, was higher than the highest quoted of 2.8%. However over 75% said their happiness increased with time and had intercourse more than 4 times per month. The trend for dissatisfaction to be more marked in recipients of malleable rather than inflatable prostheses did not reach statistical significance, although it was more likely following revision procedures.

CONCLUSION

In appropriately counselled patients the insertion of a penile prosthesis achieves the highest patient satisfaction rates, which are sustainable, and uncomparable to any other therapy for impotence, and with improving technology and device upgrades this could become the gold standard method of restoring potency in refractory erectile dysfunction.

P082

A UK audit of penile prosthesis implantation

D.J. RALPH, I. EARDLEY, I. DICKINSON, S. PAYNE and T. TERRY
BAUS section of Andrology, Institute of Urology, London, UK

INTRODUCTION

This retrospective study investigates the number of prostheses implanted by each Consultant in the UK over a 2-year period.

MATERIALS AND METHODS

Data was provided by the two main suppliers of penile prostheses in the UK on the number of prostheses implanted in the period July 2001–July 2003 according to implanting surgeon, type of prosthesis and whether it was a revision procedure.

RESULTS

420 prostheses were implanted by 76 surgeons: 37 (49%) had implanted only 1 prosthesis in the 2-year period and a further 25 (33%) implanted 6 or less (77 total); 10 (13%) implanted 7-19 prostheses (119 total) and only 4 (5%) implanted 20 prostheses or more (186 operations or 44% of all procedures). Overall 105 of the prostheses were replacements of a previous prosthesis compared to 315 primary implants implying an overall revision rate of 33%. Of the 306 prostheses implanted by surgeons implanting more than 6, 256 (84%) were 3-piece inflatables, there was a single 2-piece and 49 (16%) malleables. The surgeons implanting 6 or fewer prostheses implanted a total of 114 prostheses of which 37 (32%) were malleables, 10 (9%) 2-piece inflatables and 67 (59%) were 3-piece inflatables.

DISCUSSION

Revision rates in the UK are far higher than the world-wide expected revision rate of 5%. Guidelines are needed on the number of prostheses a surgeon should implant/year so that revision rates will fall to more acceptable levels and patients will be offered a genuine choice of product.

Wednesday 23 June 14.30–15.30 Poster Session 9: Surgical Techniques Chairmen: T. Browning and M. Soloway

P083

Intraoperative cell salvage is safe and economical in urological malignancy

R. HAMM, M. CRUNDWELL, J. POCOCK, R. MUNN, M. STOTT, M. DAUGHERTY, B. RIDDLER and J. THOMPSON
Royal Devon and Exeter NHS Trust, Exeter, UK

INTRODUCTION

Intraoperative Cell Salvage (ICS) is recommended by the NHS Executive to reduce perioperative homologous blood exposure. Urologists have been cautious, as guidelines are unclear about ICS in the presence of malignant disease. We present our experience of ICS in major open urological surgery.

PATIENTS AND METHODS

Since 1996 a prospective ICS database has been maintained. Blood transfusion requirements were recorded and patient records were reviewed with particular reference to pulmonary metastasis (suggesting infusion and lodgement during ICS) and survival.

RESULTS

ICS was used in 232 cases. Six records were lost. In 57 cases no salvaged blood was transfused; in total 33 units of bank blood was given intraoperatively. In 169 cases 618 autologous units were transfused (mean 3.5/case) along with 348 units of bank blood (mean 2.1/case). 85 patients received ICS blood alone (28 cystectomy, 12 Millins prostatectomy, 12 nephrectomy, 31 radical prostatectomy and 2 laparotomy). To date there have been no documented cases of early lung metastases in the cases that have been reviewed.

CONCLUSION

618 units of banked blood have been saved; equivalent to £56,238. Eighty-five (50%) patients did not receive intraoperative bank blood. ICS is effective and economical in urological practice and is safe even in the presence of malignancy.

P084

Chemical composition of urological endoscopic diathermy gases

R. WESTON*, R.N. STEPHENSON†, P.W. KUTARSKI† and N.J. PARR†
**Royal Liverpool University Hospital, UK; †Wirral NHS Trust, UK*

OBJECTIVE

The visible plume and associated unpleasant odour produced from urological endoscopic electrosurgical procedures will be familiar to all urologists. The aim of this study was to identify the chemical constituents of the gaseous plume produced from TURP and TUVP procedures.

MATERIALS AND METHOD

Continuous gas sampling was performed during the urological procedures. Sorbent tubes were used to collect volatile organic hydrocarbons, and were analysed by gas chromatography. Further tubes containing dinitrophenylhydrazine were used to collect aldehydes, and were analysed by high performance liquid chromatography. In addition continuous monitoring of carbon monoxide was also performed using a portable CO monitor.

RESULTS

17 organic chemicals were identified during the operations, including: benzene, toluene, carbon monoxide (CO), formaldehyde, ethylbenzene, acetone and acrylonitrile. The peak CO level detected was 498 parts per million (ppm), with a mean peak ($n = 12$ procedures) of 313 ppm.

CONCLUSIONS

Surgical smoke has been shown to be mutagenic with 1 g of pyrolysed tissue generated the equivalent mutagenicity to six cigarettes. Our study has demonstrated that the gaseous plume contains benzene and formaldehyde both of which are known carcinogens.

Carbon monoxide is produced in significantly higher levels than the other compounds

detected. The cumulative exposure levels during the procedures monitored were below toxic levels; however it is produced in significant quantities to potentially cause adverse side-effects to the surgeon such as headache fatigue and nausea. We therefore suggest that steps should be taken to reduce the amount of plume inhaled and would advocate the use of gas extraction systems for urologists who regularly undertake these procedures.

P085

A randomized controlled, single blind study to assess the effectiveness of a cardboard box as a tool for laparoscopy training

S.K. CHANDRASEKERA, N. SHAH, T.S.U. DE ZYLVA, P. BISHAI, J. DONOHUE and G.H. MUIR
King's College Hospital, London, UK

INTRODUCTION

'Dry lab' facilities are integral to laparoscopy training, but access is often limited due to the high costs involved with video-laparoscopy equipment. We assessed the effectiveness of a low cost simple training model compared to the conventional video-laparoscopy pelvic trainer for basic training.

METHODS

Twenty third-year medical students without previous surgical skills, were randomized into two groups: group A were taught basic laparoscopy skills using the video-laparoscopy pelvic trainer and group B were taught similar techniques using a cardboard box with a cut-out top to allow light and visualization. Participants in group B used unilaterally blinded surgical goggles to reduce their stereoscopic vision. Following 8 sessions of training amounting to 24 h, both groups were assessed on set tasks by a blinded examiner using the video-laparoscopy pelvic trainer and the cardboard box. Accuracy, timing and depth perception were assessed and the results compared using Student's t test.

RESULTS

There was no difference in performance between the two groups in all of the above parameters when tested on the pelvic trainer ($P > 0.3$). When comparing the two methods there was no difference in accuracy ($P > 0.05$), but timing was faster ($P > 0.05$) and the depth perception more difficult ($P > 0.05$) with the cardboard box. There was a tendency towards better performance by group B candidates when tested on the cardboard box, but did not achieve statistical significance.

CONCLUSION

For basic laparoscopy training the cardboard box, costing nothing, is a simple and effective alternative to sophisticated video-laparoscopy equipment costing €0,000.

P086

Laparoscopic nephrectomy – a retrospective review of 111 cases

B. EDDY*, J. DONOHUE*, N. BARBER*, G. MUIR*, E.U. POULSEN† and J. POULSEN*†
**Kings College Hospital, London UK; †Aalborg General Hospital, Denmark*

INTRODUCTION

Laparoscopic nephrectomy has been popularized in the field of Urology over recent years and is now treatment of choice in many centres across Europe. We have been performing it as routine across our departments since October 1999, and to date have performed 111 cases. We would like to report our experience with this procedure over the last 4 years.

METHODS

A retrospective analysis of all theatre records and patient cases notes between October 1999 and December 2003. This enabled us to review all available data on the laparoscopic simple and radical nephrectomies in addition to laparoscopic nephroureterectomies looking at indication for surgery, operating time, blood loss, length of stay, histology, complications and return to daily activities. We then compared our data to existing series for open and laparoscopic nephrectomies.

RESULTS

Of the 111 patients, 43 were for RCC, 43 were benign and 25 nephroureterectomies were performed for TCC. 7 procedures (6%) were converted to open. Mean operating time was 190 min, and mean blood loss was 150 mL.

Blood transfusions were needed in 6 patients. Post operatively we had 2 major complications and 7 minor. Mean length of stay was 4 days and at 4 weeks all patients apart from the 2 major complications had returned to normal daily activities.

CONCLUSION

Our results show that laparoscopic nephrectomy is a safe and effective procedure with minimal morbidity for all indications, and our results are comparable to other published laparoscopic series, hence we recommend that this operation should be considered in all patients requiring a nephrectomy.

P087

Laparoscopic nephrectomy: our experience of 121 consecutive cases

J.T. PHILLIPS, J.W.F. CATTO, V. LAVIN, D.J. SMITH, K.J. HASTIE and N.E. OAKLEY
Royal Hallamshire Hospital, Sheffield, UK

INTRODUCTION

Little is known about the results of laparoscopic surgery outside large centres with well-developed programmes. Here we report the results from our first 121 laparoscopic nephrectomies.

PATIENTS AND METHODS

We prospectively collected pre-, intra- and post-operative details for each patient and compared their rehabilitation with that of 100 open nephrectomies performed during the same period.

RESULTS

Whilst the overall median operative duration was 150 min (IQ range 130–180), the operative time reduced with increased surgical experience. 7 cases (6%) required conversion to open nephrectomy. Mean blood loss was 137 mL (range 0–2000 mL) and 14 patients (11.5%) required blood transfusion (mean = 3 units (range 2–8)). Most patients (64%) had an epidural for analgesia, remaining for a median of 1 day. In addition, an average of 10 mg morphine and 12 g paracetamol was required. 12 patients (10%) had significant intra-operative complications, and post-operatively, 2 patients required open exploration for refractory hypotension suggestive of haemorrhage. Twenty patients (16.5%) suffered other post-operative complications. The median time for the return of functions following surgery was 1 day for drinking (range 0–4 days), 2 days for eating (1–7), 2 days for mobilization (1–6) and 4 days for discharge (2–18). The median time to discharge for the last 100 open nephrectomies performed at our centre was significantly longer by comparison, at 8 days (range 3–45 days, $P < 0.001$).

CONCLUSION

Laparoscopic nephrectomy is safe and reliable, and offers faster recovery when compared to open nephrectomy. We believe it is now the gold standard method of nephrectomy for most renal pathology.

P088

Renal artery embolization for end-stage pelviureteric junction obstruction

H.L. WYRLEY-BIRCH, R.W.A. JONES, V. PRABHUDESAI, R.L. JAMES, D.J. WEST and M.E. FRENCH
North Staffordshire University Hospital, Stoke-on-Trent, UK

INTRODUCTION

Renal artery embolization (RAE) has been proposed for the ablation of painful, non-functioning kidneys due to end-stage pelviureteric junction obstruction (PUJO). We report the outcome of RAE in 16 such patients, with median 3.5 years follow up.

PATIENTS AND METHODS

Between 1997 and 2003, 16 patients (median age 35 years, range 20–69 years) underwent RAE (using coils and alcohol) for poorly functioning PUJO. All patients were contacted for review. Residual pain was assessed using a 10 cm horizontal visual analogue scale, blood pressure was recorded, proteinuria was assessed by urinalysis and renal ultrasound was performed. Median follow up was 3.5 years (range 0.2–6 years).

RESULTS

RAE was generally well tolerated and median hospital stay was two days. One patient developed early infection in the embolized

kidney, which resolved after insertion of a nephrostomy tube.

At follow up, residual loin pain after RAE was reported by 5 patients (31%), and one of these had subsequently undergone nephrectomy. Median pain score was 30 mm (range 13–35 mm) and was intermittent in all cases, no patients requiring regular analgesia. No patients had become hypertensive after RAE. Significant proteinuria was detected in only one patient, who had a urinary catheter in situ.

Of the 13 patients available for renal ultrasound, a degree of residual pelvicalyceal dilatation was seen in three patients (23%), all three were asymptomatic.

CONCLUSION

RAE for symptomatic poorly functioning PUJO appears both safe and effective in most patients, and may avoid the need for nephrectomy.

P089

Identification of risk factors predicting a leak at cystography following radical retropubic prostatectomy (RRP)

V.J. GNANAPRAGASAM*, P.N. BAKER*, G.P. NAISBY† and D. CHADWICK*
**Department of Urology, †Department of Radiology, The James Cook University North Queensland, Australia*

INTRODUCTION

Recent trends in RRP surgery has been towards shorter periods of catheterization without routine cystography. This study investigated risk factors for anastamotic leaks with the aim of rationalizing the use of cystography following RRP.

PATIENTS AND METHODS

In the first phase of the study the clinical notes of a 107 RRP patients were reviewed. From these, risk factors were identified that were associated with a leak at cystography (21–25 days post-operatively). Data collected included co-morbidity, pathological factors and intra and post-operative complications. In the second phase of the study ($n = 46$) we prospectively tested if the risk factors identified could predict an anastamotic leak.

RESULTS

In phase 1, 26/107 (24.2%) patients had a leak at cystography. 8/26 (30.7%) patients with leaks were noted to have anastamotic difficulties at the time of surgery compared to 4/81 (4.9%) patients who did not leak. Patients who leaked were also more likely to have an unsatisfactory on-table test flush (10/26 [38.4%] compared to 13/81 [16%] of patients who did not leak). A proven UTI was also associated with a leak at cystography. The risk factors of a difficult anastamosis, unsatisfactory test flush and urosepsis predicted 22/26 (84.6%) leaks in the phase 1 cohort. In the prospective phase 2 study, the identified risk factors predicted 7/10 (70%) of all leaks with 5/36 (13.8%) false positives. 31/46 (67.3%) patients could have been predicted to have satisfactory healing of the vesicourethral anastamosis at cystography.

CONCLUSION

A cystogram following RRP can be avoided when no risk factors are present.

P090

The Gabbay-Frater suture guide simplifies urethral–bladder neck anastomosis at open radical prostatectomy

N. AFZAL, A. KARIM, A.U. RAHMAN, H. COOK, R. BLEGAY and A.J. CORNABY
Dorset County Hospital, Dorchester, Dorset, UK

INTRODUCTION

Various techniques have been tried to facilitate the urethral-bladder neck anastomosis at open radical prostatectomy. We describe a novel and simple technique using the Gabbay-Frater™ suture guide to perform a tangle-free urethral-bladder neck anastomosis to facilitate accurate approximation of the edges.

MATERIALS AND METHODS

A hundred consecutive urethral-bladder neck anastamoses were performed between Nov 2001 and Nov 2003 using this technique. The Gabbay-Frater™ suture guide is designed for procedures requiring multiple interrupted sutures. Each suture guide provides a means for holding, organizing and controlling up to 8 sutures. Our technique involves placing six interrupted double ended sutures at 1, 3, 5, 7, 9 and 11, o' clock positions on the urethra and corresponding sites at the bladder neck.

RESULTS

Since the introduction of this device in our practice, there have been no anastomotic complications and in addition there has been a significant reduction in the time taken in performing the urethral-bladder neck anastamosis. This technique is simple and straightforward with very little chance of tangling the sutures, which is a recognized problem during radical prostatectomy.

CONCLUSION

The Gabbay-Frater™ suture guide is a cheap and readily available device, which is easy to use in performing a technically challenging anastamosis.

P091

Radical retropubic prostatectomy (RRP) after transurethral resection of prostate (TURP); does it influence the overall outcome?

M.S. NASEEM, S. SRIPRASAD, C. KOURIEFS, T. FAZILI, S. MASOOD and G.R. MUFTI
Medway Maritime Hospital, Gillingham, Kent, UK

INTRODUCTION

To compare the outcome in patients who had RRP following the diagnosis of carcinoma of the prostate after TURP with those in whom the diagnosis was made after Trans Rectal Ultrasound (TRUS) guided biopsies.

PATIENTS AND METHODS

One hundred and sixty seven patients underwent RRP, by a single surgeon (GRM), for clinically organ-confined carcinoma of prostate between 1993 and 2003. These were grouped into those who had previous TURP (Group1, $n = 31$) and those diagnosed by TRUS guided biopsies (Group 2, $n = 136$). The two groups were compared with regards to patient selection, peri-operative parameters, postoperative complications and oncological outcome. Statistical analysis was done using the 'Sigma-Stat 2.0' software programme.

RESULTS

The two groups were comparable for patient characteristics. The median operating times were 180 and 160 min in groups 1 and 2 respectively ($P = 0.056$). The median hospital stay was comparable (9 days). Forty per cent required blood transfusion in group 1 compared to 45% in group 2 ($P = 0.784$). The incidence of early complications was 13% in group 1 and 9% in group 2 ($P = 0.498$). The incidence of permanent incontinence needing intervention was 0% in group 1 and 5% in group 2 ($P = 0.07$), whereas, the incidence of erectile dysfunction and anastomotic stricture were comparable in the 2 groups. The overall biochemical recurrence rate in the 2 groups was 13% and 20% respectively ($P = 0.253$).

CONCLUSIONS

Previous TURP did not influence the peri-operative outcome or cancer control after RRP in this study. However, the incidence of long-term incontinence was lower in the TURP group.

P092

daVinci robot assisted extraperitoneal laparoscopic radical prostatectomy

H.R.H. PATEL, R. MADEB, I. VICENTE, E. ERTURK and J.V. JOSEPH
Department of Urology, University of Rochester, NY, USA

INTRODUCTION AND OBJECTIVE

To report our initial experience with the daVinci robot assisted extraperitoneal laparoscopic radical prostatectomy in the treatment of localized prostate cancer.

METHODS

During a 6-month period, we used the daVinci robot (Intuitive Surgical, Mountain View, CA, USA) to perform 50 nerve sparing laparoscopic radical prostatectomies using an extraperitoneal approach. The mean patient age was 58 (48–67), with a mean pre-operative PSA of 6.8 (1.2–16) and a mean Gleason score of 6. Intra- and peri-operative data was collected including operative time, complications, blood loss, pathology, and hospital stay.

RESULTS

Operative time including robot docking averaged 236 minutes (170 to 340). The mean blood loss was 240 cc (50–1450), however no patients required transfusion. The mean prostate weight was 47 g (27–63) and pathologic staging varied from T2 to T3a. Positive surgical margins were noted in 4 patients. Eight patients were discharged within 23 h, and the remainder

was discharged within 48 h. The urethral catheter was removed 7 days postoperatively. Shorter operative times and hospital stay were noted with increasing experience. No intraoperative or perioperative complications occurred.

CONCLUSIONS

The daVinci assisted extraperitoneal laparoscopic radical prostatectomy provides oncological results similar to the transperitoneal laparoscopic and open prostatectomy techniques. This technique has the advantage of combining the precision and improved visualization from the robot while avoiding the abdominal cavity, resulting in decreased morbidity and overall shorter convalescence.

Wednesday 23 June 16.00–17.15
Poster Session 10: Basic Science Oncology – Bladder and Kidney
Chairmen: K. Mellon and D. Neal

P093

MCM2 is a prognostic marker in renal cell carcinoma (RCC)

T.J. DUDDERIDGE*, M. LODDO*, K. STOEBER*, D.F.R. GRIFFITHS† and G.H. WILLIAMS*
**University College London, UK; †University of Wales College of Medicine, Cardiff, UK*

INTRODUCTION

Understanding DNA replication is fundamental to the study of both regulated and uncontrolled cell growth as it is the convergence point for growth regulatory pathways. The initiation of replication requires the stepwise assembly of proteins ('licensing') at chromosomal sites called replication origins. Among the proteins required for licensing are the highly conserved minichromosomal maintenance proteins (MCM 2–7).

Dysregulation of MCM proteins has been shown to occur early in epithelial carcinogenesis. In a trial of 353 patients it was shown that elevated levels of MCM5 in urinary sediments was highly predictive of bladder cancer, with an ROC value of 0.93 (Stoeber *et al. JNCI* 2002; **94**: 1071–6). Furthermore, preliminary data suggests this test also detects prostate cancer.

Use of replication licensing proteins (RLPs) as prognostic markers in urological tumours may identify high-risk patients who require additional treatment.

MATERIALS AND METHODS

178 RCC specimens, with associated survival data, are being immunohistochemically screened with antibodies against MCM2, Geminin (a negative regulator of MCM assembly) and Ki67 (a standard proliferation marker) to evaluate RLPs as prognostic markers.

RESULTS

The expression profile of MCM2 has been analysed in 94 cases demonstrating significant predictive value. At 5 years, patients with <20% MCM2 expression have 75% disease-free survival compared to 37.5% in patients with >50% expression. A Kaplan–Meier curve will display these results. The results of the completed series will be presented, comparing the performance of MCM2 to Ki67.

CONCLUSION

MCM2 is a prognostic marker in RCC. Additionally, other RLPs can be used as diagnostic and prognostic markers.

P094

Novel allogeneic whole cell vaccine protects against renal carcinoma

E.G. HAVRANEK*, M. WHELAN†, C. DESEL†, C.J. ANDERSON* and H. PANDHA*
**St. George's Hospital, London, UK; †Onyvax Ltd, London, UK*

INTRODUCTION

Imunotherapy is the most promising treatment for metastatic RCC but results are still disappointing. More specific ways of manipulating the immune system may improve response rates. Allogeneic whole cell vaccination is believed to generate tumour-reactive effector cells specific for shared antigens between vaccine and host tumour. A murine model would be helpful in optimizing this technology.

MATERIALS AND METHODS

A novel cell line (RVIK) was cloned from a murine C57 (H-2b) freshly isolated kidney and immortalized with an HPV-16 E6E7 construct. The line was characterized immunocytochemically and by measuring doubling times. To test the cells' efficiency in an allogeneic vaccine protection model, Balb/c (H-2d) mice were vaccinated at weekly intervals for 3 weeks with RVIK, RenCa or normal saline, and then tumour challenged with a syngeneic RenCa cell line. Survival of these groups was compared with a log-rank test.

RESULTS

RVIK had a doubling time of 28 h. Pancytokeratin (A1A3) and murine proximal tubules (URO-4) staining confirmed its epithelial renal cell origin. 29% of RVIK cells expressed MHC I.

In the protection experiment, the control group developed tumour within 45 days, whilst syngeneic vaccine showed 100% protection. Late RVIK vaccine conferred 45% protection at 60 days ($P < 0.05$) while early passage RVIK showed no significant protection.

CONCLUSION

RVIK has been shown to be a renal epithelial cell line, which demonstrates clear efficacy when used as an allogeneic vaccine. It may therefore form the basis of a useful model of allogeneic vaccination allowing the optimization of vaccination schedules and adjuvants.

P095

Distinct patterns of methylation and microsatellite instability occur in transitional cell carcinoma of the upper and lower urinary tract

J.W.F. CATTO*, R. AZZOUZI*, I. REHMAN*, K. FEELEY†, M. MEUTH‡ and F.C. HAMDY*
**Academic Urology Unit, †Department of Pathology, ‡Institute for Cancer Studies, Royal Hallamshire Hospital, Sheffield, UK*

INTRODUCTION

TCC is a pan-urothelial disease characterized by multiplicity. Whilst little is known about the molecular events in upper tract TCC, the carcinogenic mechanisms are presumed to be similar to that of the bladder. Epidemiological evidence suggests otherwise as upper tract TCC (UTT) have some specific associations. Here we report the extent of the mutator and methylator cancer phenotypes in TCC throughout the urinary tract.

MATERIAL AND METHODS

280 patients with primary TCC were investigated (116 bladder and 164 UTT). Analysis for promoter hypermethylation of 11 genes, using methylation sensitive PCR and bisulphite sequencing, and microsatellite instability (MSI) was performed for each tumour.

RESULTS

Hypermethylation was present in 86% of TCC and was both more frequent and extensive in UTT (94%) than bladder tumours (76%)($P > 0.0001$). Hypermethylation was associated with advanced tumour stage ($P = 0.0001$) and higher tumour progression and mortality rates ($P = 0.009$ and 0.003), compared to tumours without methylation. When tumours were stratified according to stage, the presence of methylation was highly associated with superficial tumour progression ($P = 0.00004$).

Differential patterns of MSI were present, with UTT having more frequent mono and di-nucleotide instability (16%) than bladder cancers (1%, $P = 0.0006$). The opposite was true for tetranucleotide instability, which was more common in bladder cancer (45%) than in UTT (21%, $P = 0.0001$).

CONCLUSION

Despite morphological similarities, there are genetic and epigenetic differences between TCC in the upper and lower urinary tracts. Methylation occurs commonly in urinary tract tumours, affects carcinogenic mechanism, and is an excellent prognostic marker and a potential therapeutic target.

P096

Comprehensive quantitative profiling of the matrix metalloproteinases in bladder cancer

M.J. WALLARD*, C.J. PENNINGTON†, G. MURPHY*, D.E. NEAL*, D.R. EDWARDS† and J.D. KELLY*
**University of Cambridge, UK; †University of East Anglia, Norwich, UK*

INTRODUCTION

The matrix metalloproteinases (MMPs) are a family of 24 extracellular endopeptidases involved in organogenesis and tissue remodelling, over-expressed in a variety of malignant processes. There are four tissue inhibitors of MMPs (TIMPs).

This work represents a comprehensive profile of MMP and TIMP expression in a large number of clinical specimens using quantitative real time PCR (qPCR).

MATERIALS AND METHODS

Total RNA was extracted from a tumour bank consisting of 167 TCC samples and 20 samples of normal bladder tissue, and qPCR was used to determine expression levels of MMP RNA.

RESULTS

MMPs 1, 2, 7, 11, 14, 15 and 28 were all highly expressed in TCC samples. MMPs 3, 9, 10, 12, 13, 16, 17, 19, 23, 24, and 25 were moderately expressed, whilst there was little or no expression of MMPs 8, 20, 21, 25, 26 and 27. TIMPs 1 and 3 were very highly expressed; TIMPs 2 and 4 were highly expressed.

MMPs 1, 3, 8, 9, 10, 11, 13, 14, 15, 25 and 27 demonstrated a highly significant positive correlation between tumour grade and expression. MMP19 showed a significant negative correlation, as did TIMP 4.

DISCUSSION

Profiling has confirmed high expression of commonly cited MMPs such as MMPs 9 and 14, and additionally highlighted less well documented MMPs including 11, 13 and 28, shown to be up-regulated in tumours and to correlate with tumour grade. This study forms a substantive basis for further work concentrating on key MMPs and their functional significance *in vivo* and *in vitro*.

P097

An audit of consistency of histological reporting of urothelial bladder cancer across the South West London Cancer Network

C.M. CORBISHLEY*, C. FISHER†, C. JAMIESON‡, E. RAWEILY§, L. SINGH¶ and L. TEMPLE††
**St George's Healthcare NHS Trust, London; †Royal Marsden Hospital, London; ‡Kingston Hospital, Kingston-upon-Thames, Surrey; §Mayday Hospital, Croydon; ¶St Helier Hospital, Carshalton; ††Epsom Hospital, Surrey, UK*

INTRODUCTION

The Urological Cancer Improving Outcome Guidelines recommend specialist MDT review of high risk bladder cancers where radical treatment is considered. Limited resources are available for pathology audit/review.

MATERIALS AND METHODS

All urothelial cancers and significant dysplasias diagnosed at the six network hospitals within a three month period were reviewed by a specialist pathologist. The review grade (WHO 1973) and stage (TNM 2002) were compared with the original report. Discrepancies potentially affecting clinical management were resolved by a panel of six pathologists who constitute a network wide urological pathology subgroup.

RESULTS

178 cases were reviewed and 22 cases were identified showing potential significant discrepancies of tumour grade (13.4%). The panel review reduced this number to 14 cases (8.3%). 13 cases involved upgrading of the superficial tumours from 2 to 3. The majority of discrepancies were seen in departments without subspecialist reporting. No significant alterations of stage were seen on review although discrepancies were noted in the reporting patterns of PTa and PT1 tumours. Good agreement was seen with PT2 tumours and with cases of Carcinoma *in situ*. All reports complied with RCPath and BAUS minimum data set requirements.

CONCLUSION

The network audit is reassuring and shows a high level of consistency of reporting. However it supports the view that resources should be made available to promote establishment of network pathology subgroups and subspecialization of pathology services. Central review of high risk cases of superficial (G2-3, pT1) cancer is recommended where a change of grade may affect clinical management.

P098

Multidrug resistance in bladder cancer: the role of the nuclear membrane

J.M. FEATHERSTONE*, A.J. COOPER† and B.R. BIRCH‡
**Wessex Urological Research Group; †Southampton and Portsmouth Universities; ‡Southampton University Hospitals NHS Trust, Southampton, UK*

INTRODUCTION

Multidrug resistance (MDR) is common in bladder cancer. Anthracyclines have been used extensively to investigate MDR due to their autofluorescence, which allows their study by confocal microscopy and flow cytometry. Anthracycline accumulation in 'classical' P-glycoprotein expressing MDR cells is markedly reduced and characteristically spares the nucleus. This nuclear sparing phenomenon has been demonstrated in MDR cell lines of different origins and primary cultures.

We aim to demonstrate that the nuclear membrane is responsible for this nuclear sparing phenomenon in MDR cells.

MATERIALS AND METHODS

Sensitive and MDR TCC cell lines were used. Cellular localization of epirubicin was visualized using confocal microscopy. Several techniques were used to investigate the role of the nuclear membrane including cell fusion experiments, chromosome staining of cells in metaphase (nuclear membrane absent) and direct microinjection experiments (Co-injection of Epirubicin with FITC-Dextran 77KDa).

RESULTS

We have not demonstrated a 'mixed cell fusion' containing both sensitive and resistant nuclear phenotypes. Metaphase arrest experiments show strong chromosomal epirubicin staining in both sensitive and resistant cells. Microinjection directly into cytoplasm gave sensitive cells their normal nuclear uptake pattern of epirubicin, whilst MDR cells demonstrated their characteristic nuclear sparing.

CONCLUSIONS

Our inability to produce a 'mixed cell fusion' is suggestive of some cytoplasmic-nuclear membrane interaction. Chromosomal epirubicin uptake by MDR cells in metaphase, implicates the nuclear membrane in the nuclear sparing phenomenon. Direct microinjection of epirubicin bypasses the cell membrane P-glycoprotein pump and provides conclusive evidence of the nuclear membranes role in the nuclear sparing phenomenon of MDR cells.

P099

Radioresponse in bladder cancer is enhanced by gefitinib ('Iressa', ZD1839), an EGFR tyrosine kinase inhibitor

A.J. COLQUHOUN, P.S. WOZNIAK, M. KRIAJEVSKA, E.M. TULCHINSKY and J.K. MELLON
Leicester General Hospital, Leicester, UK

INTRODUCTION

Combining novel molecular-targeted agents with conventional anti-cancer treatments is a rapidly evolving strategy for treating many cancers. We tested the combination of gefitinib, a small molecule tyrosine kinase inhibitor which targets the epidermal growth factor receptor and radiotherapy, both in vitro, using bladder cancer cell lines, and *in vivo*, using a mouse xenograft model.

MATERIALS AND METHODS

Six bladder cancer cell lines were treated with radiotherapy, gefitinib, or the combination. Growth inhibition was assessed using clonogenic and MTT assays. Using J82 cells, tumour xenografts were established in athymic nude mice. Mice were subsequently treated with radiotherapy (5Gy), gefitinib (fixed dose 50 mg/kg) or the combination and the effect on tumour volume assessed.

RESULTS

Treatment with gefitinib or radiotherapy alone resulted in dose-dependent growth inhibition in all cell lines (IC_{50} gefitinib alone 0.18–2.48 μM). In almost all cell lines, the combination of gefitinib and radiotherapy resulted in significantly greater growth inhibition than treatment with either gefitinib or radiotherapy alone (IC_{50} gefitinib and radiotherapy 0.008–1.49 μM). In mice, treatment with combined gefitinib and radiotherapy resulted in significantly lower tumour volumes than treatment with gefitinib or radiotherapy alone (Student's *t*-test, $P = 0.01–0.05$).

CONCLUSIONS

The combination of gefitinib with radiotherapy significantly diminishes cell proliferation, both in vitro and in vivo, compared with either treatment modality used on its own. These data provide the pre-clinical basis for proceeding with a clinical trial of this combination regimen in humans with muscle-invasive bladder cancer.

'Iressa' is a trademark of the AstraZeneca group of companies.

P100

Can the alkaline comet assay predict radiosensitivity in muscle-invasive bladder cancer?

B.T. SHERWOOD, M. MONEEF, K.J. BOWMAN, R.C. KOCKELBERGH, J.K. MELLON and G.D.D. JONES
University of Leicester, UK

BACKGROUND

Radical radiotherapy (RT) is used with curative intent in the management of muscle-invasive bladder cancer, but response rates are limited (approximately 50%). There is a need for techniques that predict tumour radiosensitivity, as a means of enhancing patient selection for RT. The alkaline comet assay (ACA) is a sensitive method for detecting radiation-induced DNA damage in individual cells. We have recently demonstrated that ACA measurements of radiation-induced damage predict clonogenic cell survival. Here we aim to evaluate ACA as a clinical predictive test of RT and to identify the factors responsible for variation in ACA response following irradiation.

MATERIALS AND METHODS

Cell suspensions were prepared from tissue acquired at TURBT and irradiated prior to ACA. Analysis was also performed on six bladder cancer cell lines and corresponding DNA substrates (nuclei and nucleoid bodies).

RESULT

Tumour cell preparations ($n = 24$) displayed a wide range of ACA responses. In cell lines, the response for the isolated nuclei and nucleoid bodies maintain the same rank order seen in the intact parent cells.

CONCLUSION

ACA provides an accurate measurement of bladder cancer cell radiosensitivity in vitro, and a feature of the nucleoid body appears to dictate the extent of damage induced. In tumour cell preparations, a range of responses is seen, which may reflect actual variations in tumour radiosensitivity. Further work will determine whether predicted radiosensitivity correlates with tumour clearance post-RT. ACA is feasible in tumour tissue and shows potential as a clinical predictive test of RT response.

P101

The use of Raman spectrsocopy to characterize transitional cell carcinoma *in vitro*

P. CROW*, M. HART-PRIETO†, J. UFF†, J. FARMER†, M. WRIGHT† and N. STONE†
**Torbay Hospital, Torquay, Devon, UK; †Gloucestershire Royal Hospital, Cheltenham, UK*

INTRODUCTION

Raman spectroscopy is a technique which can provide a molecular measure of the composition of tissue, by analysing the way it inelastically scatters laser light. The aim of this study was to determine whether Raman spectroscopy is able to grade and stage TCC, *in vitro*.

METHODS

36 TCC samples were independently graded and staged by two pathologists. 859 spectra were measured from the TCC samples on a Raman system employing an 830 nM excitation laser, each using an acquisition time of ten seconds.

Multivariate analysis was used to construct two diagnostic algorithms, one to predict grade, the other to predict stage. Cross-validated testing was employed to determine the accuracy of each algorithm, in predicting the grade or stage of a sample from its Raman spectrum.

RESULTS

Tables 1 and 2 show the accuracies achieved by the algorithms in predicting grade and stage, respectively.

CONCLUSIONS

Raman spectroscopy can accurately determine the grade and stage of TCC, based on its molecular composition. The technique shows promise for medical application, both in the pathology laboratory and operating theatre.

TABLE 1 The accuracies achieved by the TCC grading algorithm

	G1 TCC	G2 TCC	G3 TCC
Sensitivity	85%	77%	90%
Specificity	86%	88%	96%

TABLE 2 The accuracies achieved by the TCC staging algorithm

	pTa TCC	pT1 TCC	pT2 TCC
Sensitivity	95%	91%	80%
Specificity	96%	94%	98%

P102

Gene expression profile of urinary sediment for the non-invasive diagnosis of bladder cancer

D. MACDONALD*, S. HENDERSON*, G.B. BOUSTEAD†, D.C. HANBURY†, T.A. MCNICHOLAS† and C. BOSHOFF*
**Wolfson Institute for Biomedical Research, UCL, London; †The Lister Hospital, Stevenage, UK*

INTRODUCTION

No urine test can currently replace cystoscopy in the diagnosis or follow-up of bladder cancer. None makes any attempt to predict stage or grade of tumour. Truly non-invasive diagnosis of bladder cancer would give tumour type, stage and grade without histological examination of resected tissue. We have used expression profiling of urinary sediment to achieve this goal.

PATIENTS AND METHODS

100 mL barbotage specimens were obtained from 20 patients, 10 with TCC bladder and 10 with haematuria but no TCC. 100 ng of RNA from the cell pellets was labelled using two rounds of Eberwine amplification. The labelled cRNA was hybridized to Affymetrix U133A Genechips.

RESULT

Many genes showed significantly increased expression in the bladder cancer group including many that have been used as urinary markers of bladder cancer such as keratins 7; 8, 18 (UBC Rapid); 19 (CYFRA 21-1) and 20. Increased expression was also seen in other markers that have not been used as urinary markers of bladder cancer, including CD24, macrophage migration inhibitory factor, macrophage inhibitory cytokine 1, tumour-associated calcium signal transducer 1, Heat Shock Protein B1 and Ras-related nuclear protein – all of which are over expressed in other malignancies. Significant differences in expression pattern were seen when comparing samples from patients with low grade superficial disease (G1/2pTa) and grade 3 muscle invasive disease – including over-expression of TIMP-1 and MMP-12 in the muscle-invasive group.

CONCLUSION

Expression profiling of urinary sediment identifies those patients with bladder cancer from those who do not and can identify those with muscle-invasive disease.

P103

Adenosine 5′-triphosphate (ATP) attenuates the growth of high-grade bladder cancer *in vivo*

M. SHABBIR*, C. THOMPSON†, D. MIKHAILIDIS†, R.J. MORGAN‡ and G. BURNSTOCK§
**Department of Urology, †Department of Clinical Biochemistry, ‡Department of Urology, §Autonomic Neuroscience Institute, Royal Free Hospital, London, UK*

INTRODUCTION

We have previously shown that extracellular ATP is able to induce apoptosis in the human grade 3 bladder cancer cell line HT-1376 *in vitro* (Shabbir *et al. J Physiol* 2003:551P C65). We undertook further experiments to assess the effect of ATP on the growth of HT-1376 *in vivo*.

METHODS

Male athymic mice were injected subcutaneously with 1×10^6 HT-1376 cells in MEM and Matrigel (1 : 1, total inoculation volume 150 μL).

Daily intraperitoneal (IP) injections of ATP 25mM were commenced either the day after tumour inoculation (expt. 1 $n = 5$) or once the tumour growth was established for 14 days (expt. 2 $n = 5$). Control groups received sterile saline IP ($n = 5$ in each experiment). Tumour volume in expt. 1 was calculated as length × width × height × 0.52. The change in rate of tumour growth was calculated in expt.2 as fractional tumour volume = (volume on day measured)/ (initial pretreatment tumour volume). Statistical differences were determined using 2-way ANOVA.

RESULTS

ATP significantly reduced the growth of the implanted HT-1376 tumour in both experiments. Expt. 1: Freshly implanted tumour- treatment vs. control: ANOVA $P = 0.003$. 35 days post treatment ATP reduced mean tumour volume by 64%. Expt. 2: Established tumour growth- treatment vs. control: ANOVA $P = 0.007$. 21 days post treatment ATP reduced fractional tumour volume by 49%.

No obvious side effects relating to treatment were noted in either experimental group.

CONCLUSION

We have shown for the first time that ATP significantly reduces the growth of both freshly implanted and well established high-grade bladder cancer *in vivo*. This highlights a new potential use of ATP in the treatment of urological malignancies.

M. Shabbir is funded with a Research Fellowship Grant from The Royal College of Surgeons of England.

P104

A role for photodynamic diagnosis (PDD) in improving the quality of TURBT?

S. JAIN, R. BUTCHER and R.C. KOCKELBERGH
University Hospitals of Leicester NHS Trust, Leicester, UK

INTRODUCTION

Recognized problems with white light cystoscopy (WLC) include inadequate primary resection and failure to detect small papillary tumours. There is also difficulty in recognizing carcinoma *in situ* (CIS). Photodynamic diagnosis (PDD) better identifies malignant tissue, which metabolizes 5-aminolevulinic acid (ALA) to fluorescent protoporphyrin IX.

PATIENTS AND METHODS

Since April 2001 we have aimed to use PDD in newly presenting bladder tumours and at check cystoscopy (CC) for those at high risk (CIS or G3). 5-ALA was instilled intra-vesically 2 h prior to operation.

RESULTS

Sixty-two PDD cystoscopies were carried out on 46 patients. In 28 patients with newly presenting bladder tumours, 4 had additional unseen tumours on WLC that were only revealed by PDD and 6 had a more extensive resection. There were also 4 cases of CIS and one of high-grade dysplasia that would have been missed on WLC. Overall PDD was therefore of benefit in 54% (15 of 28) of patients.

Ten of the cases were at the time of re-resection for G3 tumour. Co-existent CIS was diagnosed in 1 patient and in 2 others fluorescent areas were histologically benign (false positives). PDD was performed on 24 occasions at CC 6 weeks following intra-vesical BCG for CIS or G3 disease. False positives occurred in 46% (11 of 24).

CONCLUSIONS

As with previous studies we have found PDD most useful as an aid to complete resection in newly presenting bladder tumours. Results in follow-up cystoscopy, especially after BCG, have been disappointing because of the high false positive rate.

Thursday 24 June 09.30–10.30
Poster Session 11: Bladder Cancer
Chairmen: G. Durkan and P. Whelan

P105

A 3-year prospective review of suspected cancer referrals to haematuria clinic

S.B. GANTA, I. YOUNG, E. CLANNACHAN, A. DOHERTY and D.M.A. WALLACE
Queen Elizabeth Hospital, Birmingham, UK

INTRODUCTION

The guidance for urgent referral of suspected urological cancer was implemented in December 2000. The efficiency and utilization of the referral process needs prospective audit in time for the guideline revision in 2004.

PATIENTS AND METHODS

Data were collected prospectively on category of referral and type of the haematuria. A total of 1879 patients were assessed between January 2001 and December 2003.

RESULT

Of the 1025 patients presenting with macroscopic haematuria only 330 (32.2%) were referred as category urgent, and only 113 (18.58 %) of the 608 with microscopic haematuria. In 245 patients the type of haematuria was not specified at referral. 19.9% of patients referred with microscopic haematuria were found to have had macroscopic haematuria when attending the clinic.

217 tumours were diagnosed, 17.64% of patients with macroscopic haematuria had an underlying urological cancer, compared to 5.9% with microscopic haematuria. There was no difference in the incidence of cancer between symptomatic (5.6%) and asymptomatic microscopic haematuria (6.1%) ($P = 0.79$). Of the patients with urological

cancer, those referred as category urgent (83/488) were seen in a median interval of 11 (range 4–40) days, and those not referred as category urgent (134/1391) were seen in 29 (6-83) days ($P = <0.001$).

CONCLUSION

There is a significant under utilization of the guidance for haematuria by the GPs resulting in significant delays for patients with urological cancers. Patients over 50 years with microscopic haematuria should continue to be included in the criteria for urgent referral of suspected cancers.

P106

Patient-specific probability of malignancy following investigation for haematuria based on a 4-year follow up

T.J. EDWARDS, J.C. HAMMONDS and J.S. MCGRATH
Derriford Hospital, Plymouth, UK

INTRODUCTION

Three unknowns exist regarding the management of patients with haematuria. Namely, the likelihood of missing malignancy in those with normal investigations, the value of additional investigation in this group (particularly in looking to exclude upper tract tumours) and how best to rationalize resources based on current evidence. This study aimed to estimate the diagnostic accuracy of a protocol based on national guidelines and of its component tests.

METHODS

We conducted a prospective audit of 4020 consecutive patients referred to the clinic between 1998 and 2003. Outcome is available for all patients. Records of the 687 people referred before 2000 were reviewed for evidence of subsequent diagnosis of urinary tract malignancy.

RESULTS

The sensitivity of the protocol for the detection of all urinary tract malignancy was 91% (95% CI 84–95); for upper tract tumours 79% (95% CI 52–92). The specificity of the overall protocol was 100% (95% CI 99–100). The likelihood ratios and estimates of disease risk derived from these data allow us to calculate the likelihood of missing disease given patient profile and specific test results.

CONCLUSIONS

The capacity to estimate post test odds of disease enable accurate discussion of remaining risk when disease has not been detected, evaluation of the potential contribution of additional tests at any stage (e.g. The value of IVP following a normal USS) and rational targeting of resources towards best improving diagnostic yield, all of which can be specific to patient subgroup.

P107

Long-term follow-up of patients discharged from a one-stop haematuria clinic

S. BANISADR, I. BOURGHLI and P.S. CALLAGHAN
Department of Urology, Conquest Hospital, East Sussex, UK

INTRODUCTION

We investigated patients discharged from our one-stop haematuria clinic (OSHC) to audit for significant missed pathology.

METHODS

418 patients were investigated at a OSHC using a standard protocol in the period of June 1998 to September 2001. The protocol included MSU (microscopy, culture and sensitivity), urine cytology, ultrasound and plain X-ray of the kidneys ureters and bladder, history, DRE, and flexible cystoscopy. 200 patients were found to be without pathology, discharged and requested to test for haematuria again in 3 months. Patients with persistent haematuria at 3 months were investigated with CT. Three years later a follow-up questionnaire was sent to these discharged patients. They were asked whether they had had any further symptoms or haematuria. Non-responders were followed by telephone and through their GPs. This resulted in a 97% response rate. Patients reporting urinary tract symptoms or haematuria on the questionnaire were fully investigated.

RESULTS

In the follow-up group two patients were found to have serious pathology. One was detected at the 3-month GP follow-up and was sent back to the haematuria clinic for further investigation as per protocol. This patient was 90 years old and refused further investigation. The only patient not detected with the protocol was investigated for haematuria 20 months after the original OSHC and was found to have a small G1pTa TCC of the bladder.

CONCLUSIONS

The diagnostic algorithm used in this OSHC is an effective way of screening patients with haematuria.

P108

Phase I trial of intravesical Suramin in recurrent superficial transitional cell carcinoma of the bladder

J.J. ORD*, E. STREETER*, A. JONES*, D. CRANSTON*, S.P. JOEL† and A.L. HARRIS‡
**Department of Urology, Churchill Hospital, Oxford; †Department of Medical Oncology, St Bartholomew's Hospital, London; ‡Cancer Research UK Institute of Molecular Medicine, Oxford, UK*

INTRODUCTION

Suramin is an antitrypanosomal agent with anti-neoplastic activity, previously shown to inhibit bladder cancer growth factor activity *in vitro* and to prevent bladder tumorigenesis when given intravesically to rats. Systemically Suramin has serious side effects. We establish a toxicity profile and recommended dose level when given intravesically.

PATIENTS AND METHODS

Open-labelled, non-randomized dose-escalation phase I study. 13 patients with a history of recurrent superficial bladder cancer grouped into four dose levels (10 to 150mg/mL in 60 mL saline). Six weekly catheter instillations, with cystoscopy performed either side of treatment. Urine and venous blood taken at cystoscopy and pre- and post-instillation. Suramin assayed using high performance liquid chromatography (HPLC), Vascular Endothelial Growth Factor (VEGF) using ELISA and urinary protein profile using surface enhanced laser desorption ionization mass spectroscopy (SELDI).

RESULTS

One patient was withdrawn mid-course with a gliosarcoma. No serious adverse events noted. Mild urinary symptoms related to treatment in two patients.

Minimal systemic absorption of Suramin recorded only at 150 mg/mL. Urinary VEGF was profoundly affected by the presence of Suramin at doses above level 50 mg/mL, corresponding to the estimated threshold of saturation of urine albumin binding. SELDI showed a disappearance of protein peaks post-treatment.

Three patients had recurrent tumours and two had dysplasia at the final cystoscopy. Four of these in the lower two dose groups.

CONCLUSION

Intravesical Suramin shows lack of toxicity and very low systemic absorption. The results of this phase I trial support the progression to expanded clinical trials of efficacy at a dose of 100mg/mL intravesically.

P109

Intravesical EOquin (EO9): a new treatment for superficial bladder cancer – results of phase I study

V. PALIT*, R. PURI*, T. SHAH*, G.M. FLANNIGAN*, P.M. LOADMAN† and R.M. PHILLIPS†
**Bradford Royal Infirmary; †Cancer Research Unit, Bradford, UK*

INTRODUCTION

EOquin (EO9, Neoquin) is an indolequinone bio-reductive drug. Intravenous administration against a number of tumours in phase II clinical trials showed poor results possibly because of rapid elimination and poor penetration. Nonetheless, this feature was thought to be advantageous if used intravesically. In-vitro studies have shown high efficacy against TCC

Aim of the study: To determine the safe dose and assess efficacy (using the marker lesion concept) of EOquin in conjunction with pharmacokinetic monitoring.

METHODS

All patients ($n = 8$) had low grade (G1/G2) multiple superficial (Ta/T1) bladder tumours.

At cystoscopy, all but one tumour (the marker lesion) was surgically removed. Two weeks later, patients received escalating doses of EOquin starting at 0.5 mg/40 mL and doubled until toxicity or the maximum dose of 16 mg/40 mL was achieved. EOquin was administered intravesically for 1 h, every week for 6 weeks. Blood and urine samples were collected to assess pharmacokinetic properties. Two-weeks after the last instillation patients had a cystoscopy to assess response.

RESULT

All patients tolerated 4 mg but above this dose, reversible dysuria and haematuria were observed in 2 patients. No systemic toxicity was observed. EOquin was undetectable in plasma collected during and at the end of instillation (<20 ng/mL). Urinary concentration of EOquin was linear and dose-dependent. In 6 patients (75%), the marker lesion disappeared and biopsies were clear of tumour. At 12 months two patients were free of tumour recurrence.

CONCLUSION

EOquin is active against superficial bladder cancer and at 4 mg has no local or systemic toxicity. Further phase II studies are planned.

P110

A three-centre experience of orthotopic neobladder reconstruction after radical cystectomy – initial experience and results in 104 patients

J.-P. MEYER*, B. DRAKE†, J. BOORER‡, D.A. GILLATT†, R. PERSAD‡ and D.P. FAWCETT*
**Royal Berkshire Hospital, Reading, UK; †Southmead Hospital, Bristol, UK; ‡Bristol Royal Infirmary, Bristol, UK*

INTRODUCTION

The ileal conduit has long been considered the 'gold standard' of urinary diversion. However in the last decade and a half a new focus has been placed on the successful construction of an orthotopic continent reservoir in an effort to preserve body image as well as providing the advantage of voiding through the native urethra. We report on a three centre experience of orthotopic neobladder reconstruction after radical cystectomy.

MATERIALS AND METHODS

Between June 1994 and April 2003 104 patients underwent cystectomy and orthotopic bladder reconstruction (90 'Studer' 12 'W pouch' and 2 'T pouch'). All patient records were reviewed from an oncological and functional point of view. 102 patients had invasive bladder neoplasms, 1 had chronic cystitis, and 1 had interstitial cystitis.

RESULTS

Median age was 62 and the median follow-up was 48 months (range 6–113 months). Median operating time was 5 h with a median post-operative stay of 14 days (range 11–68 days). Three procedures were abandoned due to technical difficulties. There was 1 in hospital death, 25 early complications with 4 patients undergoing a second laparotomy for small bowel obstruction. There were 14 late complications. 97% had day time continence (without pads), 22% had nocturnal incontinence, and 2% were fully incontinent. There were 18 deaths due to disease progression.

CONCLUSION

The results from this, the largest UK series, reveal acceptable complication rates and satisfactory continence rates without compromising 'cure rates'. We therefore feel that orthotopic reconstruction should be routinely offered to suitable patients undergoing cystectomy.

P111

A randomized trial of radical radiotherapy in pT1G3 NXM0 bladder cancer (BS06)

H. KYNASTON ON BEHALF OF THE NCRI BLADDER CLINICAL STUDIES GROUP
c/o MRC Clinical Trials Unit, London, UK

INTRODUCTION

The primary aim of this phase III trial was to determine the efficacy of radical radiotherapy in reducing the incidence of progression of pT1G3 transitional cell carcinoma of the bladder to muscle-invasive disease and subsequent disease fatality.

PATIENTS AND METHODS

Eligible patients were those with a recent diagnosis (within 6 months) of pT1G3 NXM0

tumours; complete transurethral resection; no clinical, radiological or biochemical evidence of distant metastases; no prior therapy with intravesical chemotherapy or BCG other than a single adjuvant treatment; and a WHO performance status of 0–2. Patients with single tumours were randomized between surveillance cystoscopy and radiotherapy and patients with multiple tumours (or associated CIS) were randomized between radiotherapy and intravesical therapy (either Mitomycin C or BCG - clinician's choice). The trial was designed to recruit 200 patients so as to reliably detect a decrease in the 5-year progression rate from 40% to 20% (80% power, 5% significance level).

RESULT

A total of 210 patients have been randomized between September 1991 and February 2003. The primary analysis of the trial was planned to be when approximately 52 events (progressions or death from disease or treatment) had been observed across the two arms of the trial (control versus radiotherapy). Currently 46 such events have been observed and thus by the time of the BAUS meeting we anticipate that the primary analysis of the trial will be performed.

CONCLUSION

To be presented at the meeting.

P112

Laparoscopic cystectomy: a year later

P.D. RIMINGTON*, S.K. RAI*, S. DOUGHAN*, A. ADENEYE* and P. DASGUPTA†
**Eastbourne DGH, Eastbourne, East Sussex, UK; †Guy's and St Thomas's Hospital, London, UK*

INTRODUCTION

Radical cystectomy remains the treatment of choice for invasive bladder cancer. Despite advances in our understanding of the cellular processes of bladder cancer we have not yet found a clinically applicable test to predict aggression of bladder tumours. In light of this, does laparoscopic surgery hold the promise of a less morbid procedure to help cure these patients?

METHODS

Using a 5- or 6-port technique, laparoscopic cystectomy and lymph node dissection was performed and using an appendix incision, the uretero-ileal and the ileo-ileal anastomoses were formed. In later cases the bowel anastomosis was performed intra-corporeally.

RESULTS

25 cases have been performed since October 2002, 24 males and 1 female. There were no conversions and only 2 intra-operative transfusions. Operative time has been between 4 h 15 min and 6 h 30 min. There have been 5 deaths- 1 pulmonary embolism, 1 abdominal sepsis and 3 with metastatic disease (T3b/T4 disease). There is an early morbidity of 26% and a late morbidity of 31%. The first four patients are well and disease free after 1 year.

CONCLUSIONS

Laparoscopic cystectomy is a major surgical undertaking and definitely benefits from being performed by two consultants. There are benefits in decreased hospital stay and blood transfusions, but there are problems with the uretero-ileal anastomosis which have increased the late morbidity. Laproscopic cystectomy may develop into a less morbid procedure for patients with invasive bladder cancer.

P113

Radical cystectomy vs radiotherapy for bladder cancer: results from a single centre

K.S. JANJUA, S.F. MISHRIKI, J.D. BISSET and A.G. MCDONALD
Aberdeen Royal Infirmary, UK

INTRODUCTION

Radical radiotherapy has been the conventional treatment modality for bladder cancer in the UK. Radical cystectomy is more widely adopted now. In the absence of reliable comparative studies/ randomized controlled trials, no clear benefit of one modality over the other can be supported. This study compares matched patient groups undergoing radical cystectomy or radiotherapy in a single centre.

PATIENTS AND METHODS

A total of 217 consecutive patients with high grade superficial or muscle invasive bladder tumours treated with radiotherapy or surgery were reviewed. After excluding non-TCC

pathology, the final cohort of 198 patients consisted of 107 treated with radiotherapy and 91 with radical cystectomy. Age, sex, tumour grade, tumour stage, pre procedure haemoglobin, presence/absence of hydronephrosis, radiotherapy dose, time to recurrence and cause of death were recorded.

RESULTS

Median age and median follow up for patients in the cystectomy and radiotherapy groups was 68 and 71 years and 6.2 and 5.4 years respectively. Tumour stage was comparable; T1/TIS 28 (31%) and 18 (17%), T2/T3 53 (58%) and 79(74%), T4 10 (11%) and 10 (9%) for cystectomy and radiotherapy groups, respectively. Overall and cause specific survival was better in the radiotherapy group (20 vs 26 and 25 vs 37 months). This was not statistically significant. Univariate analysis showed tumour stage, grade, pre-procedure haemoglobin and presence/ absence of hydronephrosis were significant independent predictors of overall, cause-specific and metastasis free survival.

CONCLUSIONS

Radiotherapy conferred a slight survival benefit over cystectomy. Stage, grade, pre procedure haemoglobin level and presence/ absence of hydronephrosis are significant independent predictors of survival.

P114

Presentation and management of upper tract urothelial cancers in the 21st century

K.P. JEFFERSON*, T. EDWARDS†, M. STOTT‡ and A.W.S. RITCHIE§
**Bristol Royal Infirmary; †Derriford Hospital, Plymouth; ‡Royal Devon & Exeter Hospital, Exeter; §Gloucestershire Royal Hospital, Gloucester, UK*

INTRODUCTION

Upper tract transitional cell cancers (UTTCC) are uncommon, with little published data regarding their presentation and management. Despite their scarcity, considerable resources are utilized in their detection; the value of early detection of such tumours is unproven. Data from a national cancer registry was used to determine presentation and management patterns of such tumours in contemporary practice.

METHODS

Anonymised data from 706 cases registered in 2001-2 were used. Patient sex and age at diagnosis, side of tumour, definitive grade and stage of tumour were recorded, as was mode of treatment.

RESULTS

A 2:1 male predominance was observed (454:249) with mean age at diagnosis 69.7 years (SD 10 years); 54% were left-sided. At definitive histology, G2 lesions (49.2%) were commoner than G3 (34.4%) and G1 (16.3%); 72.6% of tumours were invasive. PT2 or higher stage primary disease was seen in 14.7% of G1 tumours, 32.8% of G2 tumours and 81.2% of G3 tumours. Radical nephroureterectomy was the commonest treatment option (80.7%); 5.5% were performed laparo- or retroperitoneoscopically. Organ conserving surgery was undertaken in 6.8% and endoscopic treatment in 12.3–26% of endoscopically-treated patients required subsequent open surgery.

CONCLUSIONS

Histological grade of UTTCC is highly predictive of tumour stage. Only around one sixth of such tumours are low grade and therefore potentially treatable by endoscopic or other organ-conserving surgery. The vast majority of UTTCC are currently treated with radical open surgery; a relatively high failure rate for endoscopic surgery is observed, necessitating rigorous surveillance.

P115

Oncological control following laparoscopic nephroureterectomy: 7-year outcome

S.V. BARIOL, G.D. STEWART, S.A. MCNEILL and D.A. TOLLEY
Western General Hospital, Edinburgh, UK

INTRODUCTION AND OBJECTIVES

The reported world-wide experience with laparoscopic radical nephroureterectomy (LNU) is limited, particularly with respect to long-term outcome (Hattori *et al. J Urol* 2003). We compared the long-term oncological outcome of laparoscopic versus open nephroureterectomy (ONU) in patients with upper tract transitional cell carcinoma (TCC).

PATIENTS AND METHODS

Between April 1992 and January 1999, 26 LNU and 42 ONU were performed in a University teaching hospital for suspected upper tract TCC. Hospital medical records were retrospectively reviewed to assess preoperative staging, pathology and follow up.

RESULTS

Four patients were excluded (1 LNU and 3 ONU) as pathological diagnosis was not TCC. Median follow-up for the laparoscopic and open groups was 101 and 96 months respectively. Local recurrence occurred in 2 patients (8%) after LNU and 6 patients (15.4%; $P = 0.32$) after ONU. TCC recurred in the contralateral kidney or ureter in 2 LNU patients (8%) and 1 ONU patient (2.6%; $P = 0.34$). Bladder recurrence occurred in 7 patients (28%) following LNU, compared with 15 patients (42%; $P = 0.2$) after ONU. 1- and 5-year metastasis free survival rates were 80% and 72% for LNU, compared with 87.2% and 82.1% for ONU ($P = 0.33$ and 0.26). Upper tract tumour grade and stage influenced the incidence of metastatic and contralateral disease, but not local or bladder recurrence.

CONCLUSIONS

In the surgical management of upper tract TCC, the laparoscopic approach does not affect long-term oncological control. Tumour stage and grade are important prognostic factors for development of metastases and cancer-specific mortality.

Thursday 24 June 11.00–12.00
Poster Session 12: Urolithiasis
Chairmen: J. Cartledge and G. Watson

P116

Effect of triclosan on catheter biofilm formation by urinary tract pathogens

G.L. JONES, A.D. RUSSELL and D.J. STICKLER
Cardiff University School of Biosciences, UK

INTRODUCTION

Filling Foley catheter retention balloons with triclosan rather than water has been shown to prevent crystalline *Proteus mirabilis* biofilm development and blockage of catheters. In this study we have examined the effect of triclosan on catheter biofilm formation by a range of urinary tract pathogens.

METHODS

Experiments were performed in laboratory models fitted with all-silicone catheters. Control catheters were inflated with water and test catheters with a triclosan solution (10 mg/mL in 5% poyethylene glycol). Models were supplied with artificial urine, infected with test organisms and run for 48 h. Biofilm formation was assessed by counting the numbers of cells colonizing the catheters and by scanning electron microscopy.

RESULTS

In control models infected with *P. mirabilis*, the pH of the urine rose from 6.1 to 8.4 and the catheters blocked with crystalline biofilm within 48 h. The test models inoculated with *P. mirabilis* drained freely for 48 h as did the test and control models inoculated with the other species (*Escherichia coli*, *Klebsiella pneumoniae*, *Morganella morganii*, *Providencia stuartii*, *Serratia marscens*, *Staphylococcus aureus* and *Enterococcus faecalis*). The urine in these models remained acidic and crystals were not observed in the catheter biofilms. For all the species tested, inflating the balloons with triclosan significantly reduced the numbers of viable cells in the biofilm. Electron micrographs also revealed less biofilm on the triclosan treated catheters.

CONCLUSIONS

Inflating catheters with triclosan solutions can control the development of biofilms by a range of urinary tract pathogens.

P117

Pelvic urine and stone culture and sensitivity (C&S) are better than bladder urine C&S as predictors of urosepsis following percutaneous nephrostolithotomy (PCNL) – a prospective clinical study

P. MARIAPPAN*, G. SMITH*, S.A. MOUSSA† and D.A. TOLLEY*
**Department of Urology, †Department of Radiology, Western General Hospital, Edinburgh, UK*

INTRODUCTION

Urosepsis from manipulation during PCNL can be catastrophic despite prophylactic antibiotic cover and negative MSU C&S. It has been postulated that bacteria in the stone may be responsible for the systemic infection. This prospective study aimed to determine the correlation between different sites of urine sampling, including stones and also ascertain which is more predictive of urosepsis.

MATERIALS AND METHODS

All patients undergoing PCNL, who fulfilled our selection criteria, were recruited. The samples collected were (1) Midstream urine and bladder urine at Cystoscopy, (2) renal pelvic urine (collected on percutaneous puncture of the pelvicalyceal system) and (3) Extracted and later fragmented stones. These were sent immediately for C&S. A multivariate analysis of the data was performed to assess statistical association.

RESULTS

Within the first 6-month period, 40 procedures were suitable for analysis. MSU C&S was positive in 6.5%, stone C&S 37.5% and pelvic C&S positive in 25% patients. There was a poor correlation between bladder urine and pelvic urine and stones. Positive pelvic urine C&S strongly correlated with presence of hydronephrosis. Infected stones and pelvic urine correlated well with urosepsis. None of the patients with urosepsis had positive blood or MSU C&S. On the other hand, pelvic urine and stone C&S were positive with a high positive predictive value.

CONCLUSIONS

The results of this study suggest that positive stone C&S and Pelvic urine C&S were better predictors of potential urosepsis, compared to bladder urine. As serious infective complications are relatively infrequently encountered, the study is being continued.

P118

Split function glomerular filtration rate after flexible ureterorenoscopy

M.F. BULTITUDE, P. DASGUPTA, I. FOGELMAN, R.C. TIPTAFT and J.M. GLASS
Guy's and St. Thomas' Hospital, London, UK

INTRODUCTION

Flexible ureterorenoscopy has become a well-established treatment for diagnosis and treatment of upper tract pathology. It is minimally invasive with low morbidity. However the short-term effects on renal function are unknown as there have been no quantitative studies like this to assess function.

METHODS

As an accurate determination of renal function we have measured the split function glomerular filtration rate (GFR) on a series of patients before and after flexible ureterorenoscopy for renal stone disease. Appropriate ethical approval and licences were obtained. Patients underwent a $99m^{Tc}$-DMSA renogram and GFR measurement using 51Cr-EDTA prior to the procedure and within 24 hours afterwards. If significant decrease in function was found, patients were invited to undergo further scans.

RESULTS

Nineteen patients have completed the trial. Only one patient has suffered a reduction in renal function with a reduction in DMSA from 67 to 60% with a corresponding increase in the half-life of EDTA isotope. His creatinine rose to 156 mmol/L. He underwent the longest procedure with the use of pressure irrigation. This change may represent some deterioration due to the procedure. Two further patients have had borderline changes in GFR that are not reflected by corresponding half-life changes. These represent inaccuracies in measurement and are not significant. The renal function of the remaining patients have remained stable with no significant change.

CONCLUSIONS

We have found no trend for deterioration in renal function. This data suggests that flexible ureterorenoscopy is a safe procedure with no significant impairment of renal function post-operatively.

P119

Dehydration vs diuresis in *in situ* ESWL of ureteric calculi: a prospective randomized study

A.M. YOUSUFF and D.J. ALMOND
Department of Urology, Castle Hill Hospital, Hull, UK

INTRODUCTION

In our clinical practice it was observed that administration of iv frusemide during in-site ESWL of ureteric calculus appears to improve fragmentation rate and stone clearance. We aim to investigate the effect of dehydration Vs diuresis in the lithotripsy treatment of ureteric calculus.

METHOD

Patients with stones in the upper ureter were selected. A prospective randomized double blind study was undertaken. Patient in group A were fasted for 6 h and given a placebo injection. Patient in group B were encouraged oral fluids and given 20 mg iv frusemide at the time of treatment. Both group received standard ESWL monotherapy. The time to treatment was noted and fragmentation was observed flouroscopically. Patients were reviewed with a radiograph in 3 weeks' time.

RESULT

The mean time to treatment in group A was 25 min 30 sec and the mean number of shocks was 908. The mean time to treatment in group B was 26 minutes 03 sec. The mean number of shocks was 874. There was no statistically significant difference between the groups. However, stone fragmentation was observed in 37 /41(90%) patients in group B and 27 /41 (66%) patients had stone clearance. In group A fragmentation was observed in 26/32 (81%) patients and stone clearance in 18 / 32 (56%) patients.

CONCLUSION

Our data suggest that administration of iv frusemide during *in situ* ESWL of ureteric calculus appears to improve fragmentation rate and stone clearance. However the difference is not significant to recommend routine administration of diuretic.

P120

An evaluation of the lateral position for ureteroscopy

M.S. SIMMS, M.J. HENLEY and R.J. LEMBERGER
Nottingham City Hospital, Nottingham, UK

INTRODUCTION

Large upper third ureteric stones represent a challenge to the urological endoscopist. Not infrequently stones migrate proximally and can fall into dependent lower pole calyces which can be difficult to access with both semi rigid and flexible ureteroscopes.

We have evaluated a technique in which ureteroscopy is performed in a lateral position which places the renal pelvis rather than the calyces in a dependent position . This may allow successful fragmentation of stones within the renal pelvis.

PATIENTS AND METHODS

The lateral position was evaluated in 33 cases. The patients was placed on their side so that the affected side was uppermost. Instrumentation was performed with a 7.5 Fr Wolf semi-rigid ureteroscope and stone fragmentation was achieved with a Holmium:YAG laser.

RESULTS

Stones were located at a mean of 4 cm from the PUJ and the mean stone size was 7.5 cm. Access was achieved in 32 patients. Fragmentation was achieved in the ureter in 9 cases and in the renal pelvis in 22. 20 patients were completely clear of calculi following the procedure and 5 had fragments less than 2 mm . 8 patients required additional procedures to render them stone free.

CONCLUSION

The use of the lateral position does not impair access to stones in the ureter and is particularly useful for dealing with upper third stones. It allows stones to be effectively and safely lasered in the renal pelvis. Although this study employed a semi-rigid ureteroscope, the lateral position may also be a useful adjunct to flexible ureteroscopy.

P121

The use of fibrin glue for closure of ureterotomy after laparoscopic ureterolithotomy for big upper ureteric stones

C.W. CHENG, L.W. CHAN and C.F. NG
Division of Urology, Department of Surgery, The Chinese University of Hong Kong, Prince of Wales Hospital, Hong Kong, China

INTRODUCTION

To evaluate the clinical outcome of the use of fibrin glue in the closure of ureterotomy after laparoscopic ureterolithotomy for big upper ureteric stones.

PATIENTS AND METHODS

A retrospective review was carried out for laparoscopic ureterolithotomy performed between July 1999 and November 2003. Either the transperitoneal or retroperitoneal approach was employed. Fibrin glue was used for closure of the ureterotomy after stone removal and ureteric stenting. The post-operative course, the stone clearance rate and the median term clinical outcome were analysed.

RESULT

Twenty-eight patients were included. There were 24 males and four females. The mean age was 56 years (range 35 to 78). The stone size ranged from 15 to 34 mm. There was a predominance of the left side over the right (19:9). The stones site varied between the third lumber level and the upper sacro-iliac joint. Post-operative pain control was mainly fulfilled by oral analgesics. The median time of removal of drains was four days. The median hospital stay was 5 days. The median follow-up period was 23.5 months. Nearly all patients were free of symptoms attributable to stone disease or the procedure. The ureteric stone clearance rate was 100%. Post-operative radiological imaging did not show any obstruction in the upper urinary tract in all cases.

CONCLUSION

Laparoscopic ureterolithotomy with fibrin glue closure of the ureterotomy was an effective method for big upper ureteric stones with minimal complications.

P122

Telerobotic PCNL: it works both ways

B.J. CHALLACOMBE*, J. GLASS*, A. PATRICIU†, P. PINTO†, L. KAVOUSSI† and P. DASGUPTA ON BEHALF OF THE GUYS/HOPKINS TELEGROUP
**Guy's & St Thomas' Hospitals and GKT Medical Schools, UK; †Johns Hopkins University Hospital, Baltimore, USA*

INTRODUCTION

Despite several isolated case reports, there is little quantitative performance assessment of telerobotic surgical systems. Following our randomized controlled trial, we present t he results of the first crossover trial of telerobotic surgery employing the procedure of needle access to the kidney during percutaneous nephrolithotomy (PCNL).

METHODS

To compare trans-Atlantic robotic percutaneous needle access in two directions, we used specially designed and validated kidney models, into which a percutaneous needle was inserted 60 times. Half the insertions (30) were performed by a robotic arm in Guy's Hospital, London while controlled by a team at Johns Hopkins, Baltimore via 4 ISDN lines and half by the same robotic arm in the reverse direction. A successful needle insertion was confirmed by passage of a guide-wire or contrast into the kidney model. Both groups were then compared to a series of 30 locally controlled (non trans-Atlantic) robotic needle insertions.

RESULTS

All needle insertions were successful within 2 passes with a median of 63 seconds for the Baltimore to London attempts compared 57 seconds for the London to Baltimore attempts ($P = 0.266$). There was no statistical difference in accuracy between the directions with 84% 1st pass accuracy for the Baltimore to London attempts compared with 97% accuracy for the London to Baltimore arm ($P = 0.103$). When compared to locally controlled robotic needle insertions there was again no difference in time (median 65.9 sec) or accuracy (91% 1st pass success).

CONCLUSIONS

Telerobotic controlled surgical procedures are easily reproducible between different inter-continental sites and compare favourably with local robotic procedures.

Sources of funding: Guy's Hospital and Johns Hopkins Research Funds and Friends of Guy's.

P123

The role of laparoscopic surgery in the management of renal stones

T. NAMBIRAJAN, S. JESCHKE, N. BQAMI, K. LEEB and G. JANETSHECK
Elisabethinen krankenhaus, Linz, Austria

INTRODUCTION

Laparoscopy can be an alternative modality in the management of renal stones and we present our experience with laparoscopic renal stone surgery.

PATIENTS AND METHODS

Twelve patients (4 males, 8 females) with mean age of 54 (range 18–86) underwent 13 laparoscopic procedures for renal stones. The mean stone size was 2.0 cm (range 0.5–4.5). Of the three patients with ureteropelvic junction obstruction, two had Anderson Hynes Pyeloplasty and one Fengerplasty in addition to the stone removal. Two patients with upper pole calyceal diverticular stones had nephrolithotomy and fulguration of the diverticular mucosa. Two patients with lower pole stones and hydrocalyx, scarred cortex had lower poles resection under cold ischaemia. The remaining 5 patients, including one with horseshoe kidney (who had two procedures, one on each kidney) had pyelolithotomy as an alternative to PCNL.

RESULTS

There were no peroperative complications. The operative time was variable (mean 188 min, 115 min for Fengerplasty to 315 min for lower pole resection). The blood loss was minimal. Complete stone clearance was achieved in 92% of the procedures. One patient had a 5 mm residual stone. Three procedures were associated with postoperative fever and obstruction requiring temporary pigtail drainage. Mean hospital stay was 7 days (range 5–10). One patient with solitary kidney and stag horn calculus had prolonged urinary leak, which settled down with conservative management.

CONCLUSION

Laparoscopic renal surgery is effective in patients with complex stones and allows for adjunctive procedures like pyeloplasty, lower pole resection and management of calyceal diverticulae. It can also be an alternative to PCNL.

P124

Ureteric stones – do we need to refer to tertiary centre from district hospitals?

V. KUMAR*†, H.R. PATEL*, R.A. MILLER*, S.M. NATHAN* and A.H. LAWSON†
**The Whittington Hospital, London; †Harrogate Health Care, Harrogate, UK*

INTRODUCTION

Urinary tract stones affect 1–5% of the general population and it adds significant workload to urology department. State of the art instruments like laser and flexible ureteroscope has revolutionized the management of this common disorder. Patients with urolithiasis are still managed at local district hospitals with minimal referral to tertiary centres in spite of lack of these instruments. Hence we audited the management of patients with ureteric stones in a district hospital against EUA and AUA standards.

MATERIALS AND METHODS

All patients confirmed to have ureteric stone in IVU, identified by PAS, OPCS procedural index code and radiological procedure code, in a district hospital over two year period were analysed for stone clearance by single episode of Endoscopy/ESWL and compared with EUA and AUA guidelines.

RESULTS

Of the 154 patients with ureteric stones 73 patients (Stones <4mm) were treated conservatively. Of the 81 patients needing intervention, 2 opted for open ureterolithotomy and 3 had PCNL. Management of the remaining 77 patients are tabulated as follows

CONCLUSION

Management of stone disease in a district hospital has resource constraints. With the available equipment and once a month lithotripsy service, a stone clearance of 84.4% is achieved. The results are comparable to EUA and AUA guidelines. Hence adequate high quality stone service could be provided in a district hospital setting with minimal referral to tertiary centres by judicious use of available resources.

TABLE 1 Site of ureteric stones and their management

Site of stone	No.	ESWL	Endoscopy	Clearance ESWL	Clearance endoscopy	Clear total	AUA	EUA
UU	16	16	0	13 (81.5%)	N/A	13 (81.5%)	72%	62–100%
MU	19	6	13	5 (83.3%)	11 (84.6%)	16 (84.2%)	90%	46–100%
LU	42	7	35	4 (57.1%)	32 (91.4%)	36 (85.7%)	90%	72–100%
Total	77	29	48	22 (75.8%)	43 (89.5%)	65 (84.4%)	72–90%	62–100%

P125

Contemporary practice of percutaneous nephrolithotomy (PCNL)

S.J. SRIRANGAM, M. STOPFORD and D. NEILSON
Blackburn Royal Infirmary, Blackburn, UK

INTRODUCTION

Most series of PCNL from single specialized centres represent optimum results achievable and may not reflect outcomes of everyday practice. We analysed the practice in our region.

PATIENTS AND METHODS

Medical records of 178 patients undergoing PCNL in 2002 in participating trusts were retrospectively analysed.

RESULTS

Even outside the tertiary referral centres there was a 6-fold difference between trusts in the frequency of PCNL. In 28% of cases another stone-removing modality had been tried first. Failed renal puncture was a major cause of abandoning surgery (9%). An indication of the difficulty in obtaining complete stone clearance is that only 60% of operation notes recorded complete clearance, while 41% required a subsequent procedure (13% a secondary PCNL). Use of supra 12th rib punctures was small (6%) as was the rate of 'tube-less' PCNL (4%). 22% had simultaneous ureteric stent insertion. Approximately 8% of cases required a blood transfusion. 38 patients (23%) had a proven infection (UTI) pre-operatively (>10^4 organisms, >10 WBC) with almost all patients receiving antibiotics at anaesthesia induction. Post-operative sepsis rates (temperature >38.5°C) were similar in those with and without a pre-operative UTI (18.4% v 14.3%) and pre-operative antibiotics appeared to have little extra protective effect. Severe sepsis was rare with no patient requiring intensive care admission for this reason. Median length of stay post-operatively was 5 days.

CONCLUSIONS

These results present important figures to quote when counselling patients pre-operatively, albeit that the degree of difficulty (and hence the likelihood of problems) is identifiable from stone and anatomical configurations.

Thursday 24 June 11.00–12.00
Poster Session 13: Lower Tract Reconstruction and Trauma
Chairmen: C. Chapple and J. N'dow

P126

Tissue-engineered buccal mucosa – *in vitro* contraction and stress testing

S. BHARGAVA*, C.R. CHAPPLE*, A.J. BULLOCK† and S. MACNEIL†
**Department of Urology, Royal Hallamshire Hospital, Sheffield; †Division of Clinical Sciences, University of Sheffield, UK*

INTRODUCTION

Skin and buccal mucosa grafts are commonly utilized for urethral reconstruction. Urethroplasty being an elective procedure, it is feasible to culture tissue-engineered buccal mucosa (TE buccal mucosa) as an 'off-the-shelf' replacement for the urethra. This tissue-engineered product must be mechanically robust and once grafted it should not be limited by significant graft contraction leading to further stricture formation.

MATERIALS AND METHODS

TE buccal mucosa was cultured using oral keratinocytes and fibroblasts seeded on terminally sterilized acellular de-epidermized dermis (DED). Mechanical integrity of the epidermal-dermal attachment was tested by deliberately subjecting the TE buccal mucosa to skin graft meshing and by using a Foleys catheter in a tube constructed from TE buccal mucosa to further assess the structural integrity of the epidermis. For the purposes of determining the degree of contraction, cultures were maintained for up to 30 days and serial photographs were taken and analysed to measure the area of each model using Image J software.

RESULT

TE buccal mucosa successfully withstood mechanically stressful situations, placing the catheter in the tubularized model did not cause any damage to the epithelial lining. The TE buccal mucosa contracted by up to 40% over a period of 30 days, oral keratinocytes were found to drive contraction. Fixing the TE buccal mucosa with sutures prevented the contraction of this model by 20% in vitro.

CONCLUSION

The TE buccal mucosa is robust and capable of withstanding mechanically stressful situations. Contraction in this model was observed by up to 40% and this can be limited to 20% by fixing it, such as by application of sutures. *In vitro* testing of TE buccal mucosa shows it is suitable for clinical use in lengthy substitution urethroplasty.

P127

Could peritoneum share in solving problems of deficient and/or strictured anterior urethra? (experimental study)

F.E. MOOSSA*, M.A. AZOOZ† and K.A. FARAG‡
**El Sahel Teaching Hospital, Cairo, Egypt; †Student's Hospital of Cairo University, Egypt; ‡Faculty of Veterinary Medicine, Cairo University, Egypt*

INTRODUCTION AND OBJECTIVES

With the advent of wide and safe applicability of laparoscopic surgery, peritoneum can be easily harvested and used as a free graft in reconstructive surgery. This study aims at evaluating the feasibility of using peritoneum as a free graft for patch urethroplasty and tube urethral substitutes in a dog model.

MATERIAL AND METHODS

Ten adult male mongrel dogs were divided into two equal groups (each group included five animals). In group I, a urethral defect was performed by excizing 2 cm long portion of the urethral floor. In group II, 2 cm long segment of the urethra was excized. A free patch of peritoneum was used to repair the urethral defect in group I, whereas in group II, it was bridged by a free peritoneal tube. The peritoneum was harvested via midline abdominal incision. Clinical monitoring was done for all animals. Ascending urethrogram was performed at 15 and 30 days postoperatively, and then all animals were sacrificed for histopathological assessment.

RESULTS

Clinical and radiological assessment showed that the peritoneal graft was successfully taken in all studied cases. In group I, a diverticulum was encountered in one animal,

while the remaining four dogs showed a good urethral lumen. In group II, two animals developed stricture which was associated with fistula in one of them. A patent peritoneal tube interposition was demonstrated in the remaining three animals. Histopathologically, there was almost complete epithelialization of the graft by urothelium. The sub-epithelial layer showed scattered inflammatory reaction.

CONCLUSION

Our study demonstrated the ease of harvesting free peritoneal graft and its feasible use either for patch urethroplasty or tube urethral substitutes. Further studies concerning the application of peritoneum as a free graft in other urinary pathological conditions are now in progress.

P128

Orthotopic bladder replacement or urinary diversion – is the quality of evidence good enough?

S.M. YONG*, G. NABI*, E. ONG†, G.C. MCPHERSON‡, A. GRANT‡ and J. N'DOW*
**Department of Surgery, University of Aberdeen; †Grampian University Hospitals NHS Trust, Aberdeen; ‡Health Services Research Unit, University of Aberdeen, UK*

INTRODUCTION

Orthotopic bladder replacement following cystectomy is generally considered to be the gold standard. A review of current literature was conducted in order to examine if this belief is evidence-based. An integral component of this review involved scrutiny of the quality of available evidence using an objective assessment tool. We report on the quality assessment of present literature.

MATERIAL AND METHODS

3370 abstracts were identified from MEDLINE, PUBMED, CINAHL, EMBASE, Web of Science and Cochrane Controlled Trials Register and included hand-searching of journals between 1990–December 2002. 363 publications met the inclusion criteria for this review. Studies were subdivided based on level of evidence. The method of quality assessment used was as advocated by Black and Downs (*Br J Urol* 1996; 78: 497).

RESULTS

The quality of published articles was poor. Although randomized trials had the best mean score of 12.3 out of 27 (highest achievable score), this was suboptimal. The mean score of prospective cohorts (9.6) was not better than the mean score of retrospective historical studies (9.8). Retrospective small series produced a higher mean score (8.3) compared with prospective studies with concurrent controls (6.2) and were significantly higher when compared with retrospective single unit large series (6.3; $P = 0.004$).

CONCLUSIONS

Poorly designed and reported prospective studies were no better than well-reported retrospective studies. Larger number of study subjects in retrospective studies did not necessarily ensure higher quality research publications. Whilst it is possible that benefits of orthotopic bladder replacement outweigh disadvantages of urinary diversion, the quality of study design and reporting in the present literature is poor, making such conclusions potentially unreliable.

P129

Early complications and need for re-operation following use of bowel in urinary tract reconstruction: Is bladder replacement the new 'GOLD STANDARD'?

G. NABI*, S.M. YONG*, K. JANJUA*, G. MACPHERSON†, A. GRANT† and J. N'DOW*
**Academic Urology Unit, Medical School, University of Aberdeen; †Health Services Research Unit, University of Aberdeen, UK*

INTRODUCTION

Transposition of intestinal segments into the urinary tract is now commonplace in Urology. There is increasing belief that bladder replacement is the new 'gold standard' rather than ileal conduit diversion. We carried out a systematic review to determine whether there is evidence to support this assertion based on short term outcome data.

MATERIALS AND METHODS

We searched Medline, Pubmed, Embase, CINAHL and ZETOC from 1990 to December 2002. 3370 abstracts were reviewed including

all types of studies from prospective controlled studies to retrospective small series. All relevant articles with at least 10 patients and a mean follow up of at least 1 year were retrieved. 405 studies were suitable based on these criteria. There were no language restrictions. Data was extracted on operative complications, need for re-operation, post-operative morbidity and mortality.

RESULTS

405 studies met the inclusion criteria and included patients with urinary diversions, bladder reconstruction and bladder replacement. There were 10 randomized controlled trial, 21 prospective cohort studies, 17 comparative prospective studies, 74 retrospective comparison and 279 retrospective case series reporting on 32 795. Early complications were reported in 4 randomized controlled trials, 7 prospective cohort observational studies, 5 prospective comparative studies, 18 retrospective comparative studies and 76 retrospective case series. Based on the available evidence, there is no significant difference in short-term outcome between conduit diversion, bladder replacement, continent diversion or bladder reconstruction. However, the quality of study reports was generally poor making interpretation of the data unreliable. There was no data on cost-effectiveness of the different types of procedures. We report on the risk of short-term complications qualified by the categories of evidence and the quality of such evidence based on the quality assessment of all articles reviewed.

CONCLUSIONS

Whilst bladder replacement may well prove to be the new gold standard, there is insufficient evidence in the current literature to support this assertion based on short outcomes alone. It is the time to mount a robust prospective well designed study to allow such comparisons to be made.

P130

Is bowel dysfunction a major problem after transposition of intestinal segments into the urinary tract?

G. NABI, S. WONG, S.M. YONG, O. ENG, M. GLADYS and J. N'DOW
Academic Urology Unit, University of Aberdeen, Aberdeen, UK

INTRODUCTION

Recent sporadic reports in the literature suggest that bowel dysfunction after transposition of intestinal segments into the urinary tract is an important determinant of a poor quality of life after such surgery with reports of up to 42% incidence of new bowel symptoms. In the current age of informed consent, more emphasis on the importance of quality of life and evidence-based practice, we set out to scrutinize the current literature to determine whether there is real need for concern and the quality of evidence that heightened concern is based upon.

MATERIAL AND METHODS

We searched Medline, Pubmed, Embase, CINAHL and ZETOC from 1990 to December 2002. A search from 1990 onwards was principally undertaken because meaningful long-term follow-up data would be expected to start appearing in the literature from the 1990s. 3370 abstracts were reviewed including all levels of evidence. All relevant articles with at least 10 patients and a mean follow up of at least 1 year were retrieved. 405 studies were suitable based on these criteria. There were no language restrictions. Quality of each study design and data reporting was assessed as advocated by Black and Downs (*Br J Urol* 1996; **78**: 497).

RESULTS

There were no randomized controlled trials reporting on bowel dysfunction. Only 8 observational studies reported on bowel dysfunction (two prospective cohort studies, one prospective comparative study and 5 retrospective case series). Only one study mentioned the length of bowel segment used. There was a lack of standardization for the definition of and objective assessment criteria of diarrhoea and faecal incontinence. The quality of study design and data reporting was poor. Only diarrhoea was reported on in the prospective studies with a range of 1–13 %. There were no reports on faecal incontinence and flatus leakage in the prospective studies even though there were reports of these symptoms being very troublesome in the retrospective studies.

CONCLUSIONS

Whilst there is some evidence that bowel dysfunction could be a major problem after transposition of intestinal segments into the urinary tract, the level of current evidence is extremely poor and the quality of that evidence is poor. The immediate concern is to rectify this paucity of evidence with well-designed and well-reported prospective studies and ideally in a randomized setting.

P131

Urinary tract infections following transposition of bowel segments into urinary tract: evidence from a systematic review

G. NABI*, S.M. YONG*, G. MACPHERSON†, K. JANJUA*, A. GRANT† and J. N'DOW†
**Academic Urology Unit, University of Aberdeen, Aberdeen; †Health Services Research Unit, University of Aberdeen, UK*

INTRODUCTION

Recurrent or persistent infections often complicate urinary tract reconstruction using intestine. We carried out a systematic review to find out the prevalence of urinary tract infections following transposition of bowel segments into urinary tract (including patients with ileal conduits, continent urinary diversion, bladder reconstruction and bladder replacement).

MATERIAL AND METHODS

We searched Medline, Pubmed, Embase, CINAHL and ZETOC from 1990 to December 2002. We searched from 1990 onwards principally because bladder reconstruction using transposed intestinal segments began to be used more widely from the mid-1980s, and meaningful long term follow up data would be expected to start appearing in the literature from the 1990s. 3370 abstracts were reviewed including all types of studies from prospective controlled studies to retrospective small series. All relevant articles with at least 10 patients and a mean follow up of at least 1 year were retrieved. 405 studies were suitable based on these criteria. There were no language restrictions. Data was extracted on reported upper and lower urinary tract infection rates, CISC rates and reported incidence of catheter/urostomy pouch blockage. The quality of the study design and data reporting was assessed for each article.

RESULTS

405 studies met the inclusion criteria reporting on a total of 32 795 patients. Urinary tract infection was reported in 6/10 (60%) randomized trials, 5/21 (23%) prospective cohort studies, 3/10 (17.6%) comparative prospective studies, 13/74 (17.5%) retrospective comparative studies and 81/279 (29%) retrospective case series. The quality of reporting was extremely poor. There was no significant difference in the reported risk of UTI or mucus related complications based on type of transposed intestinal segment surgery or type of bowel segment used. Conduit diversions had the highest reported incidence of upper tract UTI (30%, range 0–52%) whilst bladder replacement had the lowest reported incidence of upper and lower tract UTI (19%, range 4–85%; and 7% range 0–36% respectively).

CONCLUSIONS

Although urinary tract infection remains a very troublesome complication following reconstruction of urinary tract using intestine, the quality of the evidence in the literature is poor. Based on current evidence, it is not possible to determine whether type of transposed segment surgery or type of bowel segment used have any significant impact on the prevalence of UTIs or excess mucus related problems. Better quality prospective studies and improved quality of reporting are urgently required.

P132

Urological injuries in patients with pelvic fractures. A single centre experience

Z. HUSSAIN, S. AGARWAL, P.V. GIANNOUDIS, I. EARDLEY and R.M. SMITH
St James University Hospital, Leeds, UK

INTRODUCTION

In recent years, the orthopaedic management of pelvic fractures has become more aggressive, with internal fixation of the fracture more commonly performed. We reviewed our recent experience of urological injuries associated with pelvic fractures.

PATIENTS AND METHODS

Between 1994 and 1999, 554 patients were admitted to our tertiary level trauma centre with a pelvic fracture. 39 patients had one or more co-existent urological injuries. The mechanism and type of injury, the initial orthopedic and urological management and the long-term urological outcome were recorded.

RESULTS

There were 7 upper tract injuries, 17 bladder injuries, (3 intraperitoneal and 14 extraperitoneal), 2 bladder neck injuries and 12 urethral injuries. All but one upper tract injuries were managed non-operatively, and had a good outcome. Almost all of the patients with a bladder injury underwent repair at the time of pelvic stabilization. In all but one case the urological outcome was good. Both patients with bladder neck disruption underwent delayed repair and had a poor outcome. In 5 patients the membranous urethral disruption was initially managed by realignment and in the rest the injury was managed initially by suprapubic catheterization. Eight patients ultimately required urethroplasty.

CONCLUSIONS

Upper tract and bladder injuries in the context of pelvic trauma can be successfully managed without significant additional morbidity. The late repair of the bladder neck injury and unrepaired urethral injuries significantly affected the outcome in terms of general health. Primary urethral alignment at the time of pelvic stabilization with delayed repair if needed produced good results.

P133

Correlation of pelvic fracture type with the nature of lower urinary tract trauma

D.E. ANDRICH and A.C. DAY
St. George's Hospital, London, UK

INTRODUCTION

It is generally believed that the nature of associated lower urinary tract injury is related to the mechanism and classification of the pelvic fracture.

PATIENTS AND METHODS

We reviewed radiographs and notes of 118 patients (85 male, 33 female) with pelvic ring fractures admitted between 1995 and 2003. The pelvic fractures were classified according to Tile and correlated with the associated lower urinary tract trauma (LUTT). The x-rays of 9 patients without LUTT were missing.

RESULTS

27 of all pelvic fractures had LUTT documented by either lower urinary tract imaging or intraoperative findings. 4/85 were complete urethral disruptions (CUD), 6/85 severe partial urethral disruptions (PUD), 8/85 minor urethral injuries and 9/118 bladder lacerations.

All 4 CUD had Tile-C fractures. All the other patients with LUTT had either a Tile-B or a Tile-C fracture but there was no specific association. 3 patients with Tile-A, 36 with Tile-B and 43 with Tile-C fractures had no LUTT.

CONCLUSION

Although CUD is usually associated with Tile-C fractures, this type of fracture does not predict the severity of urethral injury. It appears that the pelvic fracture pattern is not the only predictor of the type and severity of LUTT. The nature of injury to the ligamentous structures supporting the urinary tract may be equally important. If the ligamentous attachments are preserved, 'typical' distraction injury occurs; if the force is rapid and sufficient to rupture the ligamentous structures then the urethra may be 'mobilized' and can therefore stretch rather than rupture.

P134

Selective angio-embolization in severe renal trauma – a single centre experience

S.K. CHANDRASEKERA, C.J. WILKINS, K. WALSH, G.H. MUIR, H.L. WALTERS and P.M. THOMPSON
King's College Hospital, London, UK

INTRODUCTION

Patients with severe renal trauma may require urgent exploration and nephrectomy. Computed tomography (CT) accurately demonstrates the extent of the injury and can identify bleeding sites. In selected patients urgent angiography and selective embolization offers a viable, non-surgical, treatment option. We present our centre's experience of patients treated with selective embolization following renal trauma.

METHODS

Between 2000 and 2003, 276 patients had urgent CT for abdominal trauma. Twenty-one sustained significant renal injury: Seven of these required intervention of which 1 (grade V) underwent immediate nephrectomy and 6 (4 with grade III, 2 with grade V) were treated by interventional radiology with selective arterial embolization and renal preservation. Follow up CT to assess vascular status and potential septic complications were performed in all cases.

RESULTS

Of the 6 patients embolized, 4 had an uneventful recovery. One (Grade V) continued to bleed despite repeat embolization and required a nephrectomy. Another patient with grade V injury had a second successful ablative embolization for urinoma. There were no deaths or serious complications.

CONCLUSION

As previously reported elsewhere, most patients with renal trauma can be managed conservatively. Selective nephron-sparing reno-vascular embolization is a safe and effective minimal access method of managing arterial bleeding following severe renal trauma. It should be the first choice of intervention for the majority of renal trauma patients and should be available wherever such patients are managed.

P135

Epidemiology of urological trauma and implications for service provision and training in the UK

S.V. BARIOL*, G.D. STEWART*, R. SMITH† and D.A. TOLLEY*
**Western General Hospital, Edinburgh, UK; †Scottish Trauma Audit Group, Royal Infirmary of Edinburgh, Edinburgh, UK*

INTRODUCTION

The incidence and management of urological trauma influences service provision and should be considered during proposed restructuring of surgical training. We report the incidence, aetiology and outcome of urological trauma in Scotland, utilizing a unique database of all trauma admissions ($n = 24\,666$) between 1999-2002.

PATIENTS AND METHODS

Data was collected prospectively on all adult trauma admissions in Scotland during 4 years. Patients who sustained urological injuries were identified and studied in detail.

RESULTS

There were 362 urological injuries during the study period, at a rate of 1 per 3496 people per year. Blunt injury ($n = 285$, 79%) was the major cause of urological trauma. Mechanism of injury was road traffic accident in 197 patients (54%), assault (76, 21%), fall >2 m (45, 12%), fall <2 m (8, 2%), sport (10, 3%) and other causes (26, 7%). Renal injuries were the most common ($n = 241$, 67%), followed by external genitalia (71, 20%), bladder (65, 18%), urethra (16, 4%) and ureter (3, 1%). Revised trauma score was almost always normal in isolated urological trauma (48/52, 92%), but in only half of patients with associated injuries (151/310, 49%). Although bladder and renal injuries were frequently associated with a fatal outcome (42% and 32% respectively), isolated urological trauma was associated with 100% survival.

CONCLUSION

The majority of patients with urinary tract trauma have multiple injuries and require the services of a dedicated trauma team or a multi-disciplinary approach, rather than urological services in isolation. Knowledge of trauma epidemiology and outcomes should be used to direct appropriate training and distribution of urological services.

P136

Intracorporeal laparoscopic ileal conduit and orthotopic neo-bladder

P. DASGUPTA*, P. RIMINGTON† and A. JONES‡
**Guys Hospital and GKT School of Medicine, London; †East Sussex Hospitals, Eastbourne; ‡Royal Berkshire and Battle Hospitals, Reading, UK*

INTRODUCTION

The optimal technique of urinary diversion following laparoscopic radical cystoprostatectomy (LRC) is yet to be established. Most surgeons currently perform laparoscopic assisted ileal conduit diversion through a small muscle splitting or midline incision used for specimen delivery. The aim of this study was to assess the feasibility of laparoscopic ileal conduit and laparoscopic orthotopic neo-bladder by completely intracorporeal techniques in acute animal models.

METHODS

Using a 5-port transperitoneal technique laparoscopic ileal conduits were constructed in two anaesthetized pigs. Similar port configuration was used to create modified Studer detubularized neo-bladders with afferent limbs in three anaesthetized dogs following cystoprostatectomy. Articulating staplers facilitated isolation of bowel segments and re-establishment of continuity. Suturing was entirely intracorporeal and made easier by the use of 5/8th curved needles during neo-bladder formation.

RESULTS

Operative time for laparoscopic ileal conduit was 2.3–2.5 h most of which was for uretero-ileal anastomoses. This is at least an hour more than it takes us to perform laparoscopic

assisted ileal conduit in humans. LRC in dogs took a mean of 1 h. Laparoscopic orthotopic neo-bladder was abandoned in the first animal due to technical difficulties but in the other two the operating time was 4 and 5 h respectively.

CONCLUSIONS

Laparoscopic ileal conduit and orthotopic neo-bladder are technically feasible but advanced procedures with prolonged operative times. Whether the completely intracorporeal technique with minimal bowel handling and fluid loss shortens ileus and improves recovery needs testing in a larger group of patients undergoing LRC.

Thursday 24 June 14.00–15.00
Poster Session 14: BPH
Chairmen: S. Foley and T. McNicholas

P137

A randomized-placebo controlled pilot study of tamsulosin, naproxen, and combination in category IIIa/IIIb chronic prostatitis/chronic pelvic pain syndrome

G.R.D. BATSTONE, J. LYNCH and A. DOBLE
Addenbrooke's Hospital, Cambridge, UK

INTRODUCTION

This pilot study tests the efficacy of standard treatments for chronic prostatitis using the recently developed NIH-CPSI as a treatment endpoint.

PATIENTS AND METHODS

83 patients were recruited from a specialist CPPS clinic from January 2001 to June 2003, with duration of symptoms of at least 3 months. They were classified according the 1995 NIH classification using Stamey localization and semen analysis. After a 4-week washout period, they were randomized in double-blinded manner to placebo/placebo, tamsulosin/placebo, placebo/naproxen, tamsulosin/naproxen, assessments were made at 4 and 6 weeks. Primary endpoints were reduction in CPSI score (on a treatment completion basis) and number of responders as judged by a 25% and 50% improvement in score (on an intention to treat basis).

RESULTS

The mean total CPSI (out of 43) ranged from 22.7 to 26 in the 4 groups. 71% of patients completed treatments (equal in all groups). The median improvement in CPSI in the groups (4, 6 weeks) was as follows: placebo (2, 3), tamsulosin (2.5, 7), naproxen (3, 4.5) and tamsulosin and naproxen together (3, 3). The number of patients with a (25% and 50%) response to treatment at 6 weeks was as follows: placebo (4/20, 1/20), tamsulosin (6/20, 3/20), naproxen (7/22, 4/22) and tamsulosin and naproxen together (1/21, 0/21).

CONCLUSIONS

This pilot study confirms the efficacy of tamsulosin and naproxen as single agents for chronic prostatitis. Combination therapy was associated with a greater incidence of adverse effects, and did not seem to benefit patients.

P138

A randomized double blind crossover trial of melatonin to treat nocturia in men with benign prostatic hypertrophy

M.J. DRAKE*, I.W. MILLS† and J.G. NOBLE‡
**University of Newcastle, UK; †Pfizer Ltd; ‡Churchill Hospital, Oxford, UK*

INTRODUCTION

Nocturia is often attributed in ageing men to benign prostatic enlargement. Older adults are prone to nocturnal sleep disturbance, possibly due to disturbed circadian rhythm, since it improves with melatonin therapy. This study was designed to investigate melatonin as a potential treatment for older men with nocturia associated with bladder outflow obstruction.

PATIENTS AND METHODS

Twenty men with urodynamically confirmed bladder outflow obstruction and nocturia were entered into a randomized double-blind placebo controlled crossover study assessing controlled release melatonin 2 mg at night. Symptoms were assessed at baseline and after each four-week period of treatment using a frequency-volume chart, International Prostate Symptom Score (IPSS) and Symptom Problem Index (SPI). Maximum urinary flow rate (Q_{max}) and post-void residual (PVR) urine volume were also assessed.

RESULT

Baseline frequency of nocturia was 3.1 episodes per night. Seven men (35%) had detrusor overactivity and 10 (50%) had nocturnal polyuria. Melatonin and placebo caused a reduction in nocturia of 0.32 and 0.05 episodes per night ($P = 0.07$) and a reduction in the nocturia bother score, of 0.51 and 0.05 respectively ($P = 0.008$). Nocturia responder rates (a reduction from baseline of at least -0.5 episodes per night) differed between the active medication and placebo groups ($P = 0.04$). Daytime frequency of micturition, IPSS, relative nocturnal urine volume, Q_{max} and PVR were unaffected by melatonin treatment.

CONCLUSION

Melatonin treatment is associated with a significant nocturia response rate, improvement in nocturia-related bother and a good adverse effect profile. However, it is uncertain that the observed changes are clinically significant.

P139

The evaluation of irrigant absorption during high power KTP laser vaporization of the prostate by the use of expired breath ethanol

N.J. BARBER, G. ZHU, J. DONOHUE, P.M. THOMPSON, K. WALSH and G.H. MUIR
King's College Hospital, London, UK

INTRODUCTION

The 'Greenlight' PVP system employs a high power KTP laser to achieve rapid and effective vaporization of the prostate. Using sterile water as the irrigant raises the important issue of fluid absorption during the procedure. Employing the established technique of analysis of expired breath alcohol throughout the procedure, we set out to accurately assess any absorption.

PATIENTS AND METHODS

40 consecutive patients underwent laser vaporization of the prostate, 17 of whom had a preoperative transrectal ultrasound estimation of prostate volume (mean = 97 mL). All procedures were performed under general anaesthetic and 1% ethanol solution was used as irrigation fluid. Throughout the operation (every 10 min) the expired breath was analysed for ethanol using a standard alcometer 'plumbed' into the anaesthetic circuit. A venous blood sample was taken immediately before and after the procedure.

RESULTS

On average 155 000 J of laser energy was delivered in 47 min. In all patients and on all occasions, the expired breath ethanol remained zero. The average fall in serum sodium at the end of the procedure was insignificant at 0.37 mmol/L. No patient displayed any clinical evidence of TUR syndrome.

CONCLUSIONS

This study confirms, for the first time, the lack of significant absorption of irrigation fluid during high power KTP vaporization of the prostate using a recognized sensitive technique and confirms the safety of using sterile water as that irrigant. This remains the case even in those patients with very large prostates who are usually considered at high risk of suffering the clinical consequences of fluid absorption during TURP.

P140

Plasma kinetic vaporization is as good as transurethral resection of the prostate

D.W. BRATHWAITE, Z. HUSSAIN, S. GHIBLAWI, H. BRACE and S.W.V. COPPINGER
The Royal Shrewsbury Hospital, UK

INTRODUCTION AND OBJECTIVE

Plasma Kinetic Vaporization PKVP (Gyrus) is a new technique using bipolar diathermy to vaporize prostatic tissue. We compared its efficacy with standard transurethral resection of the prostate (TURP).

PATIENTS AND METHODS

Sixty-seven men with bladder outflow obstruction were enrolled in a prospective randomized controlled trial. Men with suspected cancer were excluded using PSA, TRUS and biopsy. The mean age of the men having PKVP was 66.2 + 9.3 years and for men having TURP was 67.4 +7.3 years. Preoperative International Prostate Symptom Score (IPSS), Quality of Life (QOL) score , uroflowmetry and post-micturition residual (using ultrasound) were obtained. The follow up interval ranged between 180 and 884 days. The preoperative parameters of both groups were not statistically different.

TABLE 1 Outcome measures

Outcome measures for the two techniques	TURP $n = 33$ (pre-operative/post-operative)	PKVP $n = 34$ (pre-operative/post-operative)
IPSS	20.6 + 7.8/5.4 + 4.9	21.8 + 6.1/7.4 + 6.9
QOL	4.1 + 1.4/0.9 + 0.9	4.5 + 1.1/1.5 + 1.5
Q_{max} (mL/sec)	10.8 + 5.3/24.8 + 15.2	11.9 + 5.6/26.1 + 14.5
Q_{ave} (mL/sec)	5.9 + 3.0/12.8 + 8.1	6.1 + 3.0/15.9 + 9.7
Postmicturition residual (mL)	186.6 + 198.7/63.6 + 60.1	122.1 + 99.3/60.6 + 58.2

RESULTS

The mean prostate volume of the men having PKVP was 35.4 + 15.1 mLs and was 42.7 + 22.2 mLs for TURP ($P > 0.05$). Ninety-one per cent of men had a successful trial without catheter on the first attempt, irrespective of the surgical modality used. Outcome measures are shown in the Table 1.

The hospital stay of both sets of men was similar by design (PKVP 3.9 + 1.1 days, TURP 4.0 + 0.9 days). There was no statistical significant difference between the two techniques with the exception of the volume of irrigant used post-operatively. Nearly double the volume of irrigant was used for TURP, compared to PKVP (36 L versus 20 L, $P < 0.05$).

CONCLUSION

PKVP is an effective and safe alternative to TURP with no statistical difference in the symptom scores and urinary flow rates after surgery.

P141

A prospective randomized study between transurethral vaporization using plasmakinetic energy and transurethral resection of prostate: 3-year follow-up

P. CHANDRASEKAR, F. KAPASI and J. VIRDI
Princess Alexandra Hospital, Harlow, Essex, UK

INTRODUCTION

A prospective randomized study was conducted to evaluate the safety and efficacy of Plasmakinetic™ energy (Gyrus electrosurgical system) that produces vaporization of tissue immersed in isotonic saline against standard transurethral resection of the prostate.

OBJECTIVES

To study the efficacy and safety of Plasmakinetic™ energy using Gyrus electrosurgical system against standard resection of using monopolar energy in the treatment of benign prostatic hyperplasia.

MATERIALS AND METHODS

Randomization was commenced in October 1998 with ratio of 2:1 (Plasmakinetic: TURP). Seventy six (22 with retention of urine) so far has been enrolled in this study with age ranging between 50 to 82 (mean 70.1) years and prostatic weight 20 to 105 (mean 48.3) g. Fifty-one patients underwent vaporization

and 25 treated by standard transurethral resection. Intra operative parameters were operating time, blood loss (Haemocue B haemoglobin system), fluid absorption during TURP by using ethanol glycine by alcoholmeter (saline was used during vaporization), serum sodium and haemoglobin. No post- operative irrigation was used and catheter was removed at 36 h.

RESULTS

Operative duration was similar in both the groups. There was no significant difference in pre and post-operative sodium and creatinine. Mean blood loss in plasmakinetic group was 251 mL (range 49–1000) and TURP group 497 mL (range 50–1750). Fluid absorption in TURP group was <500 mL. One patient in plasmakinetic group had prolonged catheterization for 5 days, 3 patients had mild stress incontinence lasting 3 months and 2 patients required TURP.

CONCLUSIONS

Plasmakinetic vaporization produced reduced intra operative bleeding and has no risk of TUR syndrome due to saline irrigant. This technique is simple to learn, offers safety with no added morbidity.

Table 1

	Plasmakinetic ($n = 51$)			TURP ($n = 25$)		
	I-PSS	QOL	Q-Max	I-PSS	QOL	Q-Max
Preop	19.9 ± 7	4.2 ± 1	8.4 ± 2	19.6 ± 6	3.7 ± 1	8.0 ± 3
6 Weeks	8.5 ± 6*	2.2 ± 2*	20 ± 10*	8.6 ± 7*	1.4 ± 1*	20 ± 10*
6 Months	4.9 ± 5*	1.1 ± 1*	18 ± 11*	5.5 ± 5*	1.0 ± 1*	19 ± 10*
12 Months	4.9 ± 5*	1.0 ± 1*	21 ± 11*	4.7 ± 4*	0.8 ± 1*	21 ± 14*
18 Months	4.3 ± 5*	0.9 ± 1*	19 ± 8*	5.3 ± 6*	1.0 ± 1*	20 ± 11*
24 Months	4.4 ± 5*	1.0 ± 1*	21 ± 11*	4.7 ± 4*	0.7 ± 1*	21 ± 11*
36 Months	3.8 ± 3*	1.0 ± 1*	20 ± 11*	4.0 ± 4*	1.0 ± 1*	22 ± 13*

P142

Holmium laser enucleation of the prostate vs plasmakinetic (Gyrus) enucleation of the prostate. A randomized trial with 1-year follow-up

P.J. GILLING, K.M. KENNETT, A.M. WESTENBERG and M.R. FRAUNDORFER
Promed Urology, Tauranga, New Zealand

INTRODUCTION

Endoscopic enucleation of the prostate is currently performed using the Holmium wavelength as the energy source because of its incisional and coagulating abilities. This randomized study was done to determine whether bipolar electrocautery energy using a bare probe (Gyrus™) could be used to perform the procedure with the same success as the holmium laser.

METHODS

All 40 patients were urodynamically obstructed with a prostate volume (TRUS) of <100 mL, an IPSS>12 and Q*max* <15. They were randomized to HoLEP or Gyrus enucleation 1 : 1. All relevant perioperative parameters were measured including operation time, amount of tissue retrieved, catheter time, hospital time and complications. The patients were followed at 1, 3, 6 and 12 months post op with Q_{max}, IPSS, QOL scores, urodynamics and TRUS were repeated at 6 months. All patients have been followed for 12 months.

RESULTS

The patients were well matched for all parameters preoperatively. The procedure took longer to perform in the Gyrus arm (57.8 min vs 43.6 min, $P < 0.05$) and more patients required postoperative irrigation (7 patients Gyrus, 1 patient HoLEP). The Gyrus patients required longer 'recovery room' time (65.6 vs 47.1 min). There was no difference however in catheter time or hospital stay and no patient required transfusion. No difference was noted in efficacy at 1, 3 and 6 months postoperatively. At twelve months the AUA scores and Q_{max} values were 4.2 (1–8) and 22 (14–28) mL/s in the Gyrus arm and 7.8 (1–18) and 24 (10–35) mL/s in the HoLEP arm. There was one urethral stricture in each group and one re-operation for symptomatic obstruction in the Gyrus arm.

CONCLUSIONS

Endoscopic enucleation of the prostate is feasible with bipolar plasmakinetic energy. In experienced hands the procedure takes longer to perform the HoLEP and involves more post-operative bleeding, however efficacy appears comparable.

P143

Catheter-free, day-case prostatectomy using the Gyrus Superpulse and Supersect loop

A.C. EATON, R.N. FRANCIS and B. DE SILVA
Arthur Levin Day Unit, King's Lynn, UK

INTRODUCTION

Plasma kinetic resection of prostate has been demonstrated to be equivalent in efficacy to standard monopolar TURP. Superior haemostatic properties lead to significantly shorter hospitalization and successful Day Case discharge with catheter *in situ*. Recent improvements to the PK generator and resection loop have further improved performance making catheter-free Day Case prostatectomy a realistic objective.

PATIENTS AND METHODS

40 urodynamically obstructed men, all ASA 1 or 2 ,underwent prostatectomy, under general or low dose spinal anaesthetic, with the Gyrus Superpulse/Supersect loop. A 3 -way catheter was inserted at the end of the procedure and 3 L saline slowly irrigated. 3 h post-operatively 250 mL of saline were infused in to the bladder and the catheter removed. Patients were discharged after completing three voids of >200 mL. All received antibiotics for 48 h and oral analgesia and were instructed to maintain a high fluid intake for 7 days.

RESULTS

Resected tissue weight was 5–50 g (mean 28 g). Hb fall was <3 g/L at discharge. 36 patients returned home within 8 h of surgery (range 3–8 h) catheter free. There were no readmissions. 4 patients were discharged home after re-catheterization and all had successful trial of void at 48 h. Analgesic requirements varied from nil to regular 6-hourly co-codamol for 48 h.

CONCLUSION

The Gyrus Superpulse generator and Supersect loop have enabled catheter-free, day-case prostatectomy to be safely offered to fit men with small to medium size prostates. The procedure is safe, effective with high patient satisfaction.

P144

Transurethral holmium laser enucleation of the prostate (HoLEP) on more than 800 patients

R.M. KUNTZ
Auguste-Viktoria-Hospital, Berlin, Germany

INTRODUCTION

With high-powered holmium (Ho): YAG lasers obstructive prostatic tissue can be incized, resected and ablated. HoLEP has been recommended as an effective alternative to traditional TUR-P and open prostatectomy. The efficiency, intraoperative, perioperative and postoperative outcome of HoLEP in more than 800 patients should be evaluated in this prospective study.

PATIENTS AND METHODS

A total of 832 obstructed patients was treated with HoLEP (Ho: YAG laser, 2.0 J, 40-50 Hz, 80–100 W), 550 nM bare laser fibres). Perioperative results: Mean patient age: 67.8 (31–94) years, mean preoperative prostatic weight: 66.6 (10–270) g, mean total resected tissue: 51.9 (3–221) g, mean operation time: 83.0 (10–240) min, mean haemoglobin loss: 1.1 (0–8.3) g/dL, mean (median) catheter time: 31.6 (24) h, mean (median) hospital stay 81.3 (48) h. Rate of incidental prostate carcinoma: 35 (4.2 %). Micturition results (preoperatively, 1 month, 1 year, 2 years, 3 years. postoperatively): AUA: 20.6, 6.0, 2.7, 3.3, 3.2, peak flow (mL/sec): 6.1, 25.6, 28.5, 28.3, 30.4, residual urine (mL): 205.8, 13.7, 11.6, 11.2, 14.0. Early complications: 16 cases (1.9) of postoperative laser coagulation of bleeding artery, 28 cases (3.3) of secondary resection, 4 cases (0.5 %) of injury of the ureteric orifice (DJ-catheter, no late sequelae). 3 patients (0.36%) needed blood transfusions. Late complications: 12 patients developed urethral strictures during the first postoperative year (12 of 375 = 3.2%).

One additional patient during the second and 1 additional patient during the third postoperative year. Bladder neck contracture developed only during the first postoperative year (10 of 375 patients = 2.7%).

CONCLUSIONS

Even in large prostates, HoLEP seems to be a highly effective endourological technique to immediately remove obstructing prostatic tissue, with a low complication rate, low blood loss and short catheter time and hospital stay.

P145

Photoselective vaporization of the prostate for BPH. Outcome at 3 months in our first 50 unselected patients

T.R.G. LARNER and J.D. NAWROCKI
Brighton and Sussex University Hospital Trust, Sussex, UK

INTRODUCTION

Photoselective vaporization of the Prostate is a novel modality for the surgical treatment of benign prostatic hyperplasia. Prostate tissue is vaporized creating a cavity similar to a TURP with little to no bleeding. This results in shortened catheterization, short hospital stay and urodynamic results equivalent to TURP at 3 months. We present the first 50 patients treated with 3-month follow-up.

PATIENTS

Patients previously listed for TURP were offered PVP as an alternative treatment. Patients with PSA above age related normal or with abnormal DRE underwent TRUS biopsy of the prostate. Symptomatic voiders ($n = 33$) additionally had uroflow, residual volume and symptom scores recorded. 17 patients had indwelling catheters.

METHODS

All patients had on-table TRUS prostate volume estimation. PVP was undertaken with the 'greenlight' side-firing 80W KTP laser through a 22 Fr continuous irrigation cystoscope.

RESULTS

No patient required post-operative irrigation or transfusion. Inpatient stay was mean 1.5 days with 34 patients staying overnight only. 37 patients required only overnight catheterization.

For symptomatic voiders mean prostate volume was 71 mL and duration of procedure 49.5 min, Q_{max} increased from mean 8.2 mL/sec to 19.1 mL/sec and IPSS fell from 22.8 to 6.6. Catheterized patients mean residual volume fell from 600 mL to 120 mL with Q_{max} of 15.4 mL/sec.

CONCLUSION

PVP provides a safe and effective alternative to TURP with similar 3-month urodynamic outcomes. The minimal bleeding allows short in-patient stay and catheterization time.

P146

Finasteride and its early effect on prostatic microvasculature

J.F. DONOHUE, N. J. BARBER, D. HAYNE, U. KARNIK, D.R. THOMAS and M.C. FOSTER
Good Hope Hospital, Birmingham, UK

INTRODUCTION

Finasteride has previously being shown to reduce haematuria of prostatic origin and blood loss during TURP. It has being shown to act, by reducing prostatic sub-urothelial microvessel density (MVD) and the expression of vascular endothelial growth factor (VEGF), which is a potent angiogenic stimulator, in the prostate. However, these results were after prolonged use of finasteride and we aimed to show that 2 weeks of finasteride would have a similar effect, confirming observations that finasteride has a quick onset of action.

METHODS

64 patients scheduled to undergo TURP were randomized to receive 5 mg of finasteride or placebo daily for 2 weeks before surgery. Sections of prostatic urothelium were stained for VEGF expression and for CD31 to assess MVD. The analysis was assessed on 10 consecutive, non-overlapping high power fields and was performed in a blinded fashion.

RESULTS

31 received finasteride and 33 placebo. Both groups were similar in age, aspirin usage, PSA and the presence of a urethral catheter. Mean VEGF expression was significantly lower in the finasteride group (47.1 ± 12.3) compared to controls (60.6 ± 19.2) ($P < 0.001$). Similarly, mean MVD was significantly lower in the finasteride arm (59.8 ± 12.9) than the control arm (70.7 ± 18.9) ($P < 0.01$).

CONCLUSIONS

This study shows that finasteride, after only 2 weeks of treatment, has a direct effect on the prostate, by inhibiting angiogenesis, which reduces the expression of VEGF and thus MVD.

Thursday 24 June 14.00–15.00
Poster Session 15: Clinical Governance – Oncology
Chairmen: B. Birch and M. Fordham

P147

A systematic review of the literature relating hospital or surgeon volume or specialization to health outcomes for three urological cancer procedures

M.C. NUTTALL*, N. PHILLIPS†, C.T. BROWN†, J. VAN DER MEULEN† and M. EMBERTON†
**Clinical Effectiveness Unit, Royal College of Surgeons of England, London; †London School of Hygiene and Tropical Medicine, UK*

INTRODUCTION

The objective of this study is to review the literature relating hospital or surgeon volume to health outcomes for the surgical treatment of prostate, bladder or renal cancer.

METHODS

MEDLINE, EMBASE, HMIC and the Cochrane databases were searched. Studies were excluded if they were not community-based or they extracted data from only one or two providers. Two reviewers assessed for inclusion criteria and assigned methodological quality scores.

RESULTS

Twelve studies related hospital volume to outcomes: 4 for radical prostatectomy, 4 for radical cystectomy, and 4 for radical nephrectomy. Four studies were retrieved relating surgeon volume to outcomes: 3 for prostatectomy and 1 for cystectomy. All studies were performed in North America and had limitations in their ability to adjust for disease stage/comorbidity, as none obtained data from case notes. For hospital volume, only 1 study did not demonstrate some improvement of outcomes with higher volumes, either with respect to mortality or other outcomes. For surgeon volume all studies found improved outcomes with increased volumes. No studies were found of the effect of surgeon volume on outcomes after nephrectomy.

CONCLUSION

Outcomes after radical prostatectomy and cystectomy are likely to be better if they are performed by high-volume providers. For nephrectomy, the evidence for a volume outcome relationship is less convincing. The validity of the evidence on the volume-outcome relationship would be stronger if data from other countries and healthcare systems were available. The nature of the volume-outcome curve remains incompletely defined or how it changes as provider experience evolves.

Bob Young Research Fellowship and RCS of England Research Fellowship

P148

Urological cancer care: survey of UK provider volumes and volume threshold levels

M.C. NUTTALL*, C.T. BROWN*, J. VAN DER MEULEN† and M. EMBERTON‡
**Clinical Effectiveness Unit, Royal College of Surgeons of England, London; †Health Services Research Unit, London; ‡Institute of Urology and Nephrology, University College London, UK*

INTRODUCTION

Studies show improving outcomes with increasing volumes in urological cancer care. However, thresholds specifying a minimum number of procedures that should be performed by either surgeon or hospital in order to confer better outcomes have not been consistently defined.

METHODS

307 members of the Section of Oncology of BAUS were sent a questionnaire asking them to state the number of radical prostatectomies (RP), radical nephrectomies (RN), radical cystectomies with ileal conduit (RCIC) and radical cystectomies with continent diversion (RCCD) that they perform/year and whether a minimum number should also be performed/year. 212 replied (69.1%).

RESULTS

15%, 46%, 23% and 69% of respondents, respectively, did not regularly perform RN, RP, RCIC and RCCD. The median (range) number

performed by surgeon/year was 12 (2–65), 20 (1–150), 8 (1–40) and 2 (1–13), respectively. The median (range) number performed by hospital/year was 27 (1–120), 23 (1–180), 15 (1–65) and 1 (1–20), respectively. For each procedure over 70% of surgeons advocated the setting of a minimum threshold of activity. The mean minimum threshold per year was 10, 14, 10 and 8, respectively. 12.7%, 7.9%, 24.5% and 56.1% of surgeons performing RN, RP, RCIC and RCCD, respectively, would need to increase their own practice to meet their own threshold.

CONCLUSIONS

A majority of surgeons agreed with the principle of setting minimum thresholds. Surgeons setting thresholds greater than their current volume seem to acknowledge a willingness to change practice. Large numbers of surgeons were not regularly performing certain procedures, suggesting a degree of sub-specialization.

Bob Young Research Fellowship.

P149

Waiting times in urological oncology: are we making progress?

D.J. PAINTER*, S. FOWLER† and A.W.S. RITCHIE*†
**Gloucestershire Royal Hospital, UK; †BAUS Cancer Registry*

INTRODUCTION

In breast cancer, introduction of the 2 week wait (2 ww) rule has cut waiting times to initial consultation but not changed the overall delay to definitive treatment (Robinson *et al BJC* 2003; **89**: 492–6). The aim of this study is to compare current urology waiting patterns to those seen before the 2 ww rule.

PATIENTS AND METHODS

Data were obtained from the BAUS Cancer Registry comprising 98,629 new cancers diagnosed 1999–2002. Comparisons were made with a previous DOH funded study into waiting times in urological oncology in England for the month of October 1997 (Spurgeon *et al. BMJ* 2000; **320**: 838–9).

RESULTS

In 1997 it took 44 and 48 days respectively for 90% of urgent prostate and bladder referrals to be seen in England. By 2002, 90% of all cases under the 2 ww rule were seen within 28 days. However, 71.3% of prostate, 68.7% of bladder, 53.1% of testis and 65.3% of penile cancers were referred outside the 2 ww rule. Referral under 2 ww rules led to shorter median waiting times to first consultation and from consultation to diagnosis. In 2002, 4 of 6 organ sites referred under 2 ww rules waited less time for definitive treatment than would have been the case if referred urgently the year before. However, 5 of 6 organ sites referred outside 2 ww rules waited longer to be treated than they would have in 2001.

CONCLUSION

Introduction of the 2 ww rule has led to more rapid initial consultations. However, there is evidence that patients referred outside these guidelines may need to wait longer for definitive treatment.

Presented on behalf of the BAUS Cancer Registry.

P150

Using a multi-disciplinary meeting uro-oncology database in clinical practice

N. CHRISTOPHER, A.C. THOMPSON, R.O. MORLEY and J.A. DICK
Kingston Hospital, Kingston upon Thames, Surrey, UK

INTRODUCTION

We are now obliged to collect minimum data sets on all new patients with urological cancers (BAUS dataset) as well as data on effectiveness and outcome in our practice and to keep our GPs promptly informed when cancer is diagnosed and of all decisions made at MDMs. All this generates increasing administration that further limits consultant time available for clinical practice. A database was developed to allow all of the above in order to automate the process as much as possible.

METHODS

Software was developed using the BAUS oncology dataset as the primary input key but using a customized Microsoft Access interface. Multiple extension databases were then linked to this to allow extended data

collection during our MDM meetings. The dataset is projected onto a screen so that MDM and BAUS data is available real time as well as the usual histology slides and X-rays. A system of drop down lists simplifies data entry and letters are automatically generated for a complete MDM session with just a few mouse clicks allowing non-medical clerical staff to do the printing and posting of letters without further medical input at the end of the meeting ensuring prompt mailing to the GP. Attendance is automatically recorded in order to fulfill Network Cancer guidelines and is included on every letter.

CONCLUSION

Our GPs are kept up to date with all oncological MDM decisions. The database can easily be extended. All data is held on the hospital server and can be easily audited whenever required.

P151

The Scottish Urological Cancer Audit (SUCA) – preliminary data

L.E.F. MOFFAT* and ALL PARTICIPATING MEMBERS OF SUCA†
**Aberdeen Royal Infirmary, UK; †All Participating Scottish Urology Units*

INTRODUCTION

The Scottish Urological Cancer Audit (SUCA) was developed in 1999 at the instigation of the then lead clinician in cancer in Scotland, and was grant funded by CRAG (£360 000). The datasets used were similar to the BAUS database but also contained more extensive details of process and outcome in terms of audit at one year. Three regional subgroups were set up with a data manager for each, and the data managers transmitted automatically data to the BAUS audit. All hospitals with one exception participated. A multidisciplinary team was set up to oversee the audit.

PATIENTS

A population-based audit was carried out, registering all patients with a primary diagnosis of urological cancer between January 2001 and January 2003. A Microsoft Access TM was designed for entry and analysis of data.

A registration form and tumour specific forms with agreed data definitions were devised. New diagnoses were identified both by clinicians, and also from scrutiny of hospital pathology reports, biochemistry reports and clinical coding. A treatment form was then filled in, being completed at one-year post diagnosis, capturing recurrence, metastases, new surgery, and imaging.

RESULTS

Data on around 7500 patients has been registered.

From demographic rates, it is estimated that over 92% of all tumours have been captured with a follow up of 35% (and rising) at 1 year.

CONCLUSION

This is the largest population based audit of urological cancer in the world. It is yielding unique insights into the presentation, delivery of care and effectiveness of treatment of urological cancer.

CRAG, (now QIS), Scottish Executive.

P152

Patient satisfaction with a nurse-led prostate cancer follow-up clinic

S. GUPTA*, I. SHERGILL†, J.M.L. HERDMAN*, S.S. MATANHELIA*, M.E. WATSON* and R.A. BLADES*
**Lancashire Teaching Hospitals NHS Trust; †Institute of Urology & Nephrology, London, UK*

INTRODUCTION

The follow-up of patients treated for prostate cancer has a significant impact on the workload of the Urology department. The introduction of nurse-led clinics offers a highly satisfactory and efficient method of follow-up. We performed a prospective audit assessing satisfaction of patients with prostate cancer, after being seen by a Urology nurse practitioner.

METHODS

282 patients were seen over a 6-month period in a protocol driven nurse-led prostate cancer follow up clinic. These included patients being followed up after radical treatment, active

surveillance and hormonal manipulation. All patients completed a questionnaire assessing satisfaction in the following categories: (1) waiting times; (2) information given to patients regarding PSA results, their implications and further follow up; (3) level of service received.

RESULTS

All patients were seen within 30 min of their appointment time. 271 patients (96%) were very satisfied with the waiting times, even though 48 of these (17%) required verification of DRE findings or management decisions by the Consultant. 279 patients (99%) were very satisfied with the information given to them by the urology nurse, and all 282 patients thought they had sufficient time for consultation. The majority of patients were satisfied with level of service received and 252 (89%) patients wanted to see the nurse again at their next appointment.

CONCLUSION

This audit highlights patient satisfaction of a nurse-led prostate cancer follow up clinic. In particular, patients are very satisfied by the waiting times, the information given to them and the level of service received in such clinics.

P153

A time saving, user friendly, multidisciplinary team meeting (MDT) database

E.G. HAVRANEK, C.J. ANDERSON, S. HENDERSON and M.J. BAILEY
St. George's Hospital, London, UK

INTRODUCTION

Accurate data collection and retrieval is essential for local and national audit projects such as the BAUS database. Most existing methods of computerized data collection are time consuming and may require dedicated data collectors. We have written a database that is easy and quick to use, allowing access to MDT information in clinic and for audit.

PATIENTS AND METHODS

We constructed an MS Access database by incorporating our paper MDT proforma and BAUS database categories This was trialled for 4 months in our MDT meetings and necessary changes made.

RESULT

The database contains 4 sections: a clinical summary, pathology details, MDT treatment decision and follow-up information. Patient demographics and histological data are copied directly from the histology department database into the MDT database. A GP letter can be printed, which includes diagnosis and treatment decision. It also produces a table which can be fed directly into the BAUS database thus minimizing duplication of work.

So far we have entered over 600 patients. Locally this is done by our Macmillan nurse who enters data onto a laptop during the MDT meeting.

We have shared this database with several other departments in our region who have easily adapted it to their local needs.

CONCLUSION

We present a user-friendly database, which allows comprehensive data-collection during MDT meetings. We would like to extend its use across the UK.

P154

Never on a Monday: the logistics and economics of the multidisciplinary meeting – a DGH experience

A.A. ADENIYI, K. PATEL, G. MCILROY, P.S. CALLAGHAN and R.O. PLAIL
Conquest Hospital, Hastings, East Sussex, UK

INTRODUCTION

NICE guidelines have made multidisciplinary meetings (MDM) in most urological units a compulsory feature. We present our experience of its logistics and economics. We believe the meetings should be weekly, never on a Monday owing to bank holiday constraints and the attendees should include a cancer data clerk, clinical oncologist, histopathologist, radiologists, urologists, trainees, a specialist cancer nurse and a clinical trials nurse.

PATIENTS AND METHODS

A total of 6 months data comprising a retrospective and prospective enquiry into the MDM records retrieved from a hospital information system and histopathology database verified weekly by urology Sprs.

RESULTS

An average of 13 case discussions in each meeting with an average attendance at each meeting of 9 team members. The average age of the patients was 65 years. The cancer diagnoses discussed included prostate (48%), bladder (28%), renal cell (11%)and testis (8%). 40% of patients were discussed 2 or more times with an average of 1.6 discussions for each patient. Approximation of staff costs indicate that each MDM costs approximately £500, i.e. £38.50 per patient per meeting.

The value of the MDM includes peer review, discussion of new evidence, enhanced information dissemination to primary care, early decision on treatment, recruitment to cancer trials, learning opportunity for trainees and enhanced team working.

CONCLUSION

The MDM is pivotal in delivering rapid and robust clinical decision and efficient cancer management. It also represents sound economics in the face of increased litigation.

P155

Observational Teamwork Assessment for Surgery (OTAS)

S. UNDRE, A.N. HEALEY, C.A. VINCENT and A. DARZI
St Mary's Hospital, London, UK

INTRODUCTION

Team performance is increasingly recognized as an essential foundation of good surgical care and as a determinant of good surgical outcome. In order to understand team performance and to develop team training, reliable and valid measures of team performance are necessary.

METHODS

The 'observational teamwork assessment for surgery' (OTAS) tool is used to assess surgical process, under the categories of Patient, Environment, Equipment, Provisions and Communications tasks. We also use a behavioural observation scale 'online' to rate behaviour for the three surgical phases (pre-operative, operative, and post-operative) with components of teamwork: co-operation, leadership, co-ordination, awareness and communication. It is a generic tool that can be modified and applied to any speciality, for example urology.

RESULTS

Preliminary results from our first 40 cases revealed considerable variability in key team dimensions such as leadership, cooperation and coordination. Systematic observation also revealed that many standard procedures were not routinely performed such as checking of anaesthetic and surgical equipment, diathermy and suction machines. There were also lapses in communication of basic clinical information.

CONCLUSIONS

The OTAS tool enables two independent observers, a surgeon and psychologist, to record detailed information not only on what the theatre team does but also on how this is done. This assessment has the potential to identify constraints to performance that might relate to surgical outcome and error. OTAS has also been adapted for team training in simulation, in an attempt to bridge the gap between research findings, guideline development and their implementation in the Operating Room.

P156

Virtual surgical assistants

S.P. GOWLAND*, P.F. BAGSHAW*, P.G. ALLEY†, P.J. FARRY‡ and J. CADWALLADER§
**Christchurch Hospital; †North Shore Hospital; ‡Otago University; §Mercy Ascot Hospital, New Zealand*

All surgeons and their teams benefit from national and international collaboration This New Zealand government funded project aims to redevelop video conferencing standards so the reliable regular 'teleporting' of surgical colleagues will be available 'on demand' The teleported colleague will be able to act as a 'virtual' assistant in the host's operating room.

The features of the technology are:

1. broadcast quality transmission with minimal delay (5 mb/sec bandwidth),
2. the 'virtual' assistant can select from a range of cameras using a portable 'remote communications module',
3. diagrams can be generated and a cursor can demonstrate points of interest,
4. the system has contractually defined 99.8% reliability,
5. collaborating surgeon appears 'life sized'.

A NZ$5 million surgical bus travels around New Zealand on a 5 weekly cycle and has been constructed as a high quality camera equipped theatre. Session availability in towns and cities is known a year ahead and on the chosen day the surgical team decamps to the 'bus' in the hospital car park hosted by bus staff.

The project started in October 2002 and to date 47 sessions have been completed between surgeons in New Zealand and Australia. The cases ranged from new techniques in laparoscopic hernia repair to enhancements to laparoscopic nephrectomy in the renal transplant donor setting.

To address surgical collaboration the premise was to electronically mimick what is done now... invite a colleague to visit and assist with a difficult or unusual case or with one where there is a new idea. This is feasible now. The next 'proof of concept' phase is to expand the network to 3 hospitals in the UK and 4 in North America.

It is hoped if benefits are seen the volumes of links will accrue and like the telephone the cost will become affordable to all.