BJUI SUPPLEMENTS

BAUS Annual Meeting, 21–24 June 2010, Manchester Central

Paper Sessions

Tuesday 22 June
Paper Session A
14:00–16:00 Charter 3,4,5
PROSTATE CANCER TREATMENT
Chairmen: Mr Peter Malone & Professor Alberto Briganti
Papers 104–113

Wednesday 23 June
Paper Session B
08:45-10:30 Charter 3,4,5
BLADDER CANCER TREATMENT
Chairmen: Mr Sunjay Jain & Professor Hassan Abol-Enein
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Paper Session C
14:00–16:00 Charter 3,4,5
STONES/IMAGING/UPPER TRACT DISORDERS
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Papers 158–169

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PROSTATE CANCER TREATMENT
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Papers 104–113

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Detection and characteristics of primary circulating prostate cells, association with the presence of bone marrow micrometastasis and implications for the surgical treatment of prostate cancer. The ProTECT (Prostate Tumour Early Cancer Test) Study

NP Murray, L Badinez, E Reyes, N Orellana, R Dueñas
Facultad de Medicina Universidad Mayor, Chile

Introduction: At present there is no clinical test to determine pathological stage of prostate cancer pre-operation. The objective of the study was to determine the frequency of circulating prostate cells in men with prostate cancer, the coexpression of tumor suppressor CD82 and the association with bone marrow micrometastasis. The results were compared with pre-operation serum PSA, Gleason score and pathological stage post-radical prostatectomy.

Methods and Patients: Mononuclear cells were separated from blood and bone marrow by differential centrifugation and prostate cells identified by immunocytochemistry using anti-PSA, positive samples were sub-classified using anti-CD82. 3 groups were defined, 1) circulating cell negative, 2) circulating cell positive CD82 positive and 3) circulating cell positive CD82 negative.

Results: 77 men participated, 58 (75.3%) had primary circulating prostate cells detected Patients in group 2 were significantly older and had lower Gleason scores. There were no differences in serum PSA at time of diagnosis. The frequency of micrometastasis was 1/19 (5.3%), 4/19 (20%) and 26/39/66.7%) respectively, RR, 1.0, 4.8, 36.0 ($p < 0.001$ Chi squared trends), the frequency of pT3 disease was 2/19 (10.5%), 6/19 (31.6%) and 23/39 (59.0%) respectively RR 1, 3.93, 12.2 ($p < 0.001$ Chi squared trends). Men negative for circulating tumor cells had a significantly lower frequency of micrometastasis and pT3 disease, $p < 0{,}001$ and $p < 0{,}001$ Chi squared) than men circulating cell positive.

Table for 104

	CPC negative	CPC positive CD82 positive	CPC positive CD82 negative	Total
N° Patients	19	19	39	77
Mean age	68.9 ± 5.8 yrs	75.3 ± 8.5 yrs*	64.7 ± 9.9 yrs	68.4 ± 9.7 yrs
PSA at biopsy	5.83 ± 2.67 ng/ml	12.41 ± 12.0 mg/ml	12.93 ± 11.6 ng/ml	11.27 ± 10.61 ng/ml
% pT 3	2/19 (10.5%)	6/19 (31.6%)	23/39 (59.0%)	31/77
RR	1.00	3.93	12.2	P < 0.001
Gleason = 6	8/19	0/19	29/39	37/77
%micromet astasis	1/19 (5.3%)	4/19 (20%)	26/39 (66.7%)	31/77
RR	1,00	4.80	36.0	P < 0.001

CPC = circulating prostate cell RR = relative risk*$p < 0.05$

Conclusions: Men negative for circulating prostate cells or with CD82 positive cells are significantly less likely to have micrometastasis and/or pT3 disease, identifying men in whom radical prostatectomy would be first line treatment.

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Prostate Cancer Staging Nomograms: Validation on A British Population

T. B. L. Lam, O Regnier-Coudert, J McCall, R Lothian, S McClinton
Aberdeen Royal Infirmary, United Kingdom

Introduction: Commonly used prostate cancer nomograms such as Partin tables are based on US data. We constructed new predictive nomograms based on data from the BAUS Oncology Audit and validated the tables for use on a UK population.

Materials and Methods: Complete data was available for 1701 patients. Nomograms were

Table 1 for 105. Concordance indices of the different models

	Partin tables with US Data	Partin tables with BAUS Data	Multinomial LR with BAUS Data	Ordinal LR with BAUS Data
EP vs. OC	0.696	0.602	0.610	0.609
SV vs. OC	0.830	0.709	0.713	0.714
LN vs. OC	0.894	0.819	0.873	0.863

created for pathological stage (PS) prediction using PSA, biopsy Gleason score (GS) and clinical stage (CS) as predictors. PS was subdivided into organ confined (OC), extraprostatic extension (EP), seminal vesicle involvement (SV) and lymph node involvement (LN). Logistic Regression (LR) and bootstrap resampling methods were used to generate new nomograms and concordance indices were calculated.
Results: Within the models constructed using UK data, the new nomograms had significantly higher concordance indices than those of Partin tables (Table 1). The concordance indices of all nomograms based on UK data were significantly lower than those of Partin tables calculated from US data.
Conclusions: When applied to non-US populations, Partin nomograms do not achieve the same level of concordance as originally obtained from US internal validation. This may reflect cultural, genetic and healthcare system differences between the different populations. This study suggests that nomograms constructed using local data may have more relevance and applicability. The poorer concordance index of the UK-derived nomograms in comparison with the US-derived Partin tables may reflect the smaller sample size of the BAUS dataset but could also be due to the limitations of using LR for prostate cancer staging prediction. As such, alternative modelling methods should be explored.

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Outcome of patients on active surveillance for low-risk prostate cancer in a cohort of British men with low screening penetrance

GM Mukerji, J Nariculam, G O Hellawell, P Abel, M Winkler
Charing Cross Hospital, London, United Kingdom

Introduction: Active surveillance with selective delayed intervention is a treatment regimen used in patients with low risk prostate cancer. In this retrospective study, we evaluated the outcome of patients managed by active surveillance (AS), the incidence and predictors of cancer progression and the pathological findings of delayed radical prostatectomy.
Patients and Methods: Eighty-five men (median age 67 years) with early prostate cancer (stage T1c-T2a) who were managed initially with active surveillance were identified. Factors such as PSA at diagnosis, Gleason score, number of positive cores, re-biopsy Gleason score, stage/grade progression, clinical outcomes on patients who progressed to treatment, status at last follow-up, etc. was evaluated.
Results: Of the 85 men, 55 (64.7%) men remained on AS at a median follow-up of 20 months (range, 2 to 67 months). Upgrading of tumour grade was observed in 30% on re-biopsy. Rising PSA (16, 53.3%) and cancer progression on re-biopsy/MR scan (12, 40%) were the commonest reasons for failure of AS. Twenty-two (25.8%) men received radical treatment [EBRT-14, Laparoscopic radical prostatectomy (LRP)-7 and HIFU-1]. The remaining 8 (9.4%) patients received palliative hormonal therapy. Extra-prostatic disease/positive surgical margins were more common in patients who underwent LRP following AS compared to those who underwent LRP as primary management. Number of positive cores, presence of high grade PIN and Gleason 4 were significant variables predicting failure of AS.
Conclusion: Active surveillance is designed for screen detected prostate cancer and may not be safe in its current format if applied to a largely unscreened cohort of British men.

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Low Risk Prostate Cancer: Is Active Surveillance a Safe Option?

NJ Rukin, K Williams, B Waymont, P Cooke, P Patel
Good Hope Hospital, Sutton Coldfield, United Kingdom

Introduction: With the advent of the NICE prostate cancer guidelines in 2008, much controversy was raised in relation to the management of low risk prostate cancer. Recommended first line treatment options include radical surgery or radiotherapy and active surveillance. In our practice we were unsure how effective active surveillance would have been, especially in those patients who were treated with radical surgery.
Method: We performed a retrospective review of all patients undergoing radical prostatectomy over the last 2 years. Demographics were recorded along with pre-operative staging. Patients were grouped into low risk prostate cancer according to NICE guidelines. Post operative staging and prognostic information were reviewed in order to establish if active surveillance would have been a safe option for their management.
Results: 26 patients, median age 65.5 (46.3–76.9), with PSA <10, Gleason $3+3$ and T1-T2a were studied. Median PSA was 5.99. 81% had T1c disease. 38% of these patients had upstaging to T3 disease. Gleason upgrading occurred in 23% of patients. Overall positive surgical margins were 27%, with 50% of T3 disease having positive margins. Median follow up was 10.8 months, and 2 patients had biochemical failure. Only 2 patients (8%) are true histologically low risk prostate cancer.
Conclusion: In our population, NICE defined low risk prostate cancer patients are not low risk. Only 8% of our cohort fulfilled the criteria. We report a 38% upstaging of cases to T3 disease. Our practice is now changing in order to counsel such patients about the risk of active surveillance.

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To re-biopsy or not. Re-biopsy in Active Surveillance: Is this an important aspect of management?

O Kalejaiye, N Burns-Cox, R Mason
Taunton & Somerset NHS Trust, United Kingdom

Introduction: The inclusion of a re-biopsy policy into Active Surveillance has always been controversial. Upgrading over time must be balanced against complications which may be associated with repeat biopsies. We reviewed all patients entered into Active Surveillance to determine the proportion re-biopsied and its effect on subsequent management.
Materials and Methods: We interrogated oncology records and databases to identify patients diagnosed with localised prostate

cancer in January 2006 – December 2008 and managed with Active Surveillance. These patients' details were subsequently used to search our histology database for repeat biopsies and clinic letters reviewed to determine subsequent management.
Results: 148 patients diagnosed with localised prostate cancer in 2006-2007 were enrolled into Active Surveillance. Within this group, 39 (26%) were re-biopsied. The mean age of patients re-biopsied was 66.14. The re-biopsied patients were categorised into low risk (59%), intermediate risk (31%) and high risk (10%) based on NICE definitions. Re-biopsy resulted in 22 patients being upgraded (56%) and a change in treatment recommendation in 16 (41%) patients.
Conclusion: In the future, we will detect prostate cancer in increasing numbers. Many of these will be localised and may be managed with Active Surveillance. Histological upgrading does occur on repeat biopsies. However, changes in PSA and histology may change our decision making with respect to the options patients are offered. We would recommend that both PSA and repeat biopsies should guide the decision-making process. In addition, we must be cautious that Active Surveillance does not become Watchful Waiting.

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LDR prostate brachytherapy: Clinical outcomes and toxicity at 10 years of follow up in 1300 patients

A M Emara, A M Abdelbaky, M Lynch, J Nobes, R W Laing, S E M Langley
Royal Surrey County Hospital, Guildford, United Kingdom

Introduction: To report on the long term outcome of patients treated by LDR prostate brachytherapy (BXT).
Patients & Methods: Since 1999 we have treated 1309 patients with BXT for prostate cancer. Biochemical failure (Houston + 2) was calculated in 743 patients treated with a minimum 3 years follow up. 174 of 226 (77%) patients treated 5-10 years ago replied to a questionnaire assessing urinary, erectile and bowel function (IPSS, IIEF 5 and QLQ-C30/PR25). The former two were compared with pre-treatment values.
Results: Overall 10-year survival was 98.62% with 3 patients (0.23%) who died from progression of prostate cancer. PSA survival was 93%, and stratified was 94%, 92% and 90% for low, intermediate and high risk patients respectively.

Long-term toxicity: mean IPSS score increased from 6.3 to 8.1 at follow up ($p < 0.05$). Of the patients with mild symptoms pre-BXT (IPSS 0–7), 66% remained in this group at follow up, 33% developed moderate symptoms (IPSS 8–19), and 1% severe symptoms (IPSS 20–35). 98% reported good/acceptable quality of life secondary to urinary symptoms (IPSS QOL 0–4).

63% of patients potent (IIEF > 13) pre-BXT remained potent at (5–10 yr) follow up. There were no differences in the proportions potent when analysed by the number of years post implant.

At follow up, 52% and 45% of patients, respectively, had normal or mild bowel function (QLQ-C30/PR25 = 4, 5–8). 3% of patients reported severe symptoms (QLQ-C30/PR25 = 9–16).
Conclusion: This study demonstrates excellent clinical outcomes with low morbidity in a large mature cohort of patients.

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First 500 cases of robotic-assisted laparoscopic prostatectomy from a single UK centre: Learning curves of two surgeons

N Sharma, A Papadopoulos, NC Shah, DE Neal
Addenbrooke's Hospital, Cambridge, United Kingdom

Introduction: A structured mentoring programme was used in our centre to implement robotic-assisted laparoscopic prostatectomy (RALP).
Patients & Methods: We evaluated 500 cases of RALP performed by 2 surgeons, including PSA, Gleason score, clinical and pathological stage, intra-operative factors, positive margin rate (PMR), complications, hospital stay and urinary (ICS SF) and sexual function (IIEF).
Results: 48% of men were of the intermediate D'Amico risk group, with another 10% of men having high-risk disease. The mean age was 61 yrs and 70% underwent bilateral nerve-sparing RALP. For both surgeons, blood loss and operative time significantly reduced with experience. The mean robotic operative time was approximately 2 hours after 250 cases. The major complication (Clavien III-V) rate was 1%. 50% of patients had pT3/pT4 disease, and 50% of these men had T1c disease pre-operatively. The overall PMR was 20%, with PMRs showing a direct relationship with both pathological stage and D'Amico risk group. There was a significant reduction in PMR with surgeon experience: 9% for pT2 and 15% for pT3 disease in the final 50 cases. For both surgeons, over 94% of men are continent or wearing only 1 pad and 75% of men who underwent bilateral nerve sparing are potent sufficient for intercourse, at a minimum of 12 months follow-up. These outcomes were significantly better with greater surgeon experience.
Conclusion: Our results are comparable to those from other major international centres. Both oncological and functional outcomes continued to improve up to 250 cases, suggesting the learning curve for RALP is higher than previously considered.

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UK Radical Prostatectomy Outcomes and Surgeon Case Volume: based on analysis of the BAUS Complex Operations Database

SG Vesey, J E McCabe, S Fowler
Southport & Ormskirk NHS Trust, United Kingdom

Introduction: Improving Outcomes Guidelines (IOG) implementation resulted in the concentration of major urological cancer surgery into specialist centres where it is performed by fewer surgeons. Evidence supporting the perceived outcome benefits of this for UK radical prostatectomy patients is lacking. This paper looks at UK radical prostatectomy outcomes and the effect of surgeon case volume.
Methods: All entries on the BAUS complex operations database were subjected to pre and postoperative analysis with respect to Gleason grade, operative approach, surgeon case volume, margin status and biochemical evidence of relapse (BR).
Results: 8032 radical prostatectomy cases were studied. 212 surgeons working at 96 institutions performed a median total of 12 cases each. The median number of cases performed per annum per surgeon was 5. Only 4206 of the original cases had follow up data recorded. Median follow up was 9 months (range 1–134). BR was significantly lower for laparoscopic surgery compared to open surgery ($p < 0.001$). Positive surgical margins were recorded in 37.6% of cases, this rate was significantly lower for

laparoscopic (33%) compared to for open surgery (39.7%). BR was higher for margin positive than for margin negative cases ($p < 0.01$). Margin positive rates and BR rates were considerably lower for surgeons performing $\geq$25 cases per annum.
Results: In the UK laparoscopic prostatectomy offers lower margin positive and BR rates than open surgery. Higher volume surgeons have better disease outcomes. These results would suggest merit in raising the IOG minimum surgical case load recommendations from 5 to 25 radical prostatectomy operations per annum.

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Intermittent Hormone Therapy: Thirteen year experience in a District General Hospital
H Fernando, BD Sarmah
Birmingham Heartlands Hospital, United Kingdom

Introduction: Medical castration results in disabling side effects - anaemia, osteoporosis, impotence, cognitive functional effects, weight gain and generalized lethargy. Thus far no difference in survival has been demonstrated between IHT and continuous hormone therapy despite large numbers and prolonged follow-up. We present our thirteen year experience on patients who were put on IHT for prostate cancer.
Materials and Methods: This is a retrospective study with prospective data collection between 1996–2009 of patients put on IHT over this period. These patients were managed by a single consultant in a district general hospital.
Results: 116 patients with a mean age of 77.07 ($\pm$ 6.29) were followed up for 72.43 months (range: 15–198). The patients included those with localised disease with no previous treatment, biochemical recurrence after failed curative treatment and those with metastatic disease. 86.2% of patients had biopsy for diagnosis. 35.3% were off hormones when the study was analysed. 22.4% had died during follow-up. However, only 2.5% of deaths were related to prostate cancer. The mean duration off hormones was 20.64 months for the 1st cycle, 14.12 months for 2nd cycle and 15 months for the 3rd cycle. The median nadir PSA when stopped was 0.4ng/ml. Just off treatment alone £1840, £1203 and £1266 respectively was saved per cycle per patient.
Discussion: IHT offers a useful, cost-effective alternative in patients who experience side-effects of castration, without compromising the oncological principles. IHT should be offered to all patients once the PSA touches nadir after explaining the potential benefits.

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Outcome of a 'step up' androgen deprivation therapy regime in osteoporotic men requiring hormone manipulation for prostate cancer
KC Ekwueme, M Kumar, AM Cliff, PW Kutarski, RN Stephenson, NJ Parr
Wirral University Teaching Hospital, United Kingdom

Introduction: Bicalutamide monotherapy (BiM) is licensed for locally advanced prostate cancer (CaP), but also a recognised option for some groups with metastatic disease. Although responses to LHRHA treatment, with addition of bicalutamide at relapse are well described, responses to BiM with LHRH at relapse are less well characterised.
Patients and Methods: From January 1999 to December 2008, 217 men, mean age 78 yrs (range 53–94), with osteoporosis and PSA $<$400 ng/ml, requiring ADT for locally advanced or metastatic CaP were commenced on BiM and followed up in a dedicated clinic, with LHRHA added at relapse.
Results: Median PSA at presentation was 29 ng/ml (range 1.5–348). All patients demonstrated PSA response, with median nadir 0.9 ng/ml (range 0.1–23), at median of 14 months (range 1–100). At a mean follow-up of 34 months, 45 (21%) required LHRHA for consecutive rises in PSA (median 27, range 4–167 ng/ml). 30 (67%) responded with PSA dropping to 4.3 (range 0.1–58 ng/ml) at 2–4 months.

Of 172 initially commenced on BiM and not requiring additional LHRHA, 54 (31%) died from other causes at a mean of 35 months from start of therapy.
Conclusions: In this group, where LHRHA would have aggravated osteoporosis, BiM demonstrates a high initial response; with approximately half remaining on it at around 3 yrs follow up. More die of non CaP causes, than requiring LHRHA for relapse. When LHRHA is required, majority respond to step up. BiM is also considerably cheaper than LHRHA and is probably underutilised in advanced CaP.

BJUI SUPPLEMENTS

Wednesday 23 June
Paper Session B

08:45 – 10:30 Charter 3,4,5
BLADDER CANCER TREATMENT
Chairmen: Mr Sunjay Jain & Professor Hassan Abol-Enein
Papers 126 – 136

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High-risk Non-muscle Invasive Bladder Cancer – "The Real Deal" for Blue Light Cystoscopy and TURBT?

P Geavlete, B Geavlete, M Jecu, R Multescu, D Georgescu, M Dragutescu
Saint John Emergency Clinical Hospital, Bucharest, Romania

Objectives: In this study, we aimed to evaluate the impact of hexaminolevulinate blue light cystoscopy (HAL-BLC) and transurethral resection of bladder tumors (BL-TURBT) upon the short-term recurrence rate in high-risk non-muscle invasive bladder cancer (HR-NMIBC), by comparison to white light cystoscopy (WLC) and WL-TURBT.
Methods: Between December 2007 and November 2009, 446 patients were randomized for HAL-BLC and BL-TURBT and for WLC and WL-TURBT, respectively. The inclusion criteria consisted of positive urinary cytology and ultrasonographic suspicion of bladder tumors. A single immediate postoperative mitomycin-C instillation was performed in all cases. HR-NMIBC patients (CIS, pTaG3 and pT1) from both series underwent standard Re-TURBT 6 weeks after the initial procedure.
Results: The proportions of CIS, pTaG3 and pT1 cases in the initial series were 13.1%, 5.7% and 22.2% in the HAL-BLC series and 11.3%, 5.7% and 23.3% in the WLC series. In total, 72 and respectively 64 HR-NMIBC cases were diagnosed in the HAL-BLC and WLC series. The overall short-term recurrence rate at Re-TURBT was 11.1% for the HAL-BLC group and 31.2% for the WLC group. The recurrence rates in CIS, pTaG3 and pT1 cases were 4.3% versus 27.8%, 10% versus 22.2% and 15.4% versus 35.1% for the HAL-BLC and WLC series, respectively. The recurrence rate in patients presenting high-grade tumors was 17.2% in the HAL-BLC group and 37% in the WLC group.
Conclusions: HAL-BLC and BL-TURBT significantly reduced the short-term recurrence rates determined during the standard Re-TURBT in all categories of HR-NMIBC patients by comparison to WLC and WL-TURBT.

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Early recurrence following Photo-Dynamic Diagnosis (PDD) assisted TURBT is significantly lower than with good quality white light TURBT (GQWL-TURBT) – a prospective controlled study

CH Anderson, H Lee, S Stewart, I El-Mokadem, B Rai, R Donat, P Mariappan
Western General Hospital, Edinburgh, United Kingdom

Introduction: Having previously validated the value of good quality white light TURBT (GQWL-TURBT) (BJUI 103(suppl 4): 3, 2009), we compare the recurrence rate at first follow-up cystoscopy (RRFFC) between PDD assisted TURBT and GQWL-TURBT in patients with non-muscle invasive bladder cancers (NMIBC).

Materials and Methods: Two prospectively maintained cohorts were used – (WL-TURBT) had white light TURBT in 2007/8 and (PDD-TURBT) had PDD assisted TURBT for all new tumours from 2009. Tumour features, completeness of resection and recurrence were recorded prospectively on a proforma. GQWL-TURBT was defined as completely resected NMIBC with detrusor muscle present in the specimen and the patient receiving Mitomycin-C post-operatively (doi: 10.1016/j.eururo.2009.05.047). RRFFC included findings at first check cystoscopy or early re-TURBT (when indicated). Tumours were stratified into the standard low, intermediate and high risk groups. Multivariate logistic regression analysis determined association between variables. Patients awaiting cystoscopy were excluded from this RRFFC analysis.
Results: Of 404 new tumours, 153 had GQWL-TURBT and 102 PDD-TURBT. The overall RRFFC for PDD-TURBT and GQWL-TURBT were 8.6% and 26.5%, respectively (OR = 3.8, 95%CI = 1.3-11.9, p = 0.005). RRFFC for risk strata are described in the table:

Table for 127

NMIBC risk category	RRFFC for GQWL-TURBT (%)	RRFFC for PDD-TURBT (%)	OR (95%CI), p
Low risk: (G1/G2 Ta, single and <3 cm)	11/61 (18.0)	0/24	1.2 (1.1–1.4), p = 0.02
Intermediate risk: (G1/G2, Ta/T1, ≥3 cm or multiple and <3 cm)	10/32 (31.3)	2/16 (12.5)	3.2 (0.5–24.7), p = 0.1
High risk: G3 (high grade) Ta/T1	14/39 (35.9)	3/18 (16.7)	2.8 (0.6–14.7), p = 0.1

Conclusion: PDD-TURBT is associated with a significantly lower risk of early recurrence compared with even GCWL-TURBT.

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Is there a risk of metastasis following T0 histology on cystectomy specimen following neodjuvant chemotherapy and radical cystectomy versus radical cystectomy alone?

N Vasdev[a], P Aluru[b], R Veeratterapillay[a], M Shaw[a], I Pedley[c], M Johnson[a], G Durkan[a], D Green[b] A Thorpe[a]
[a]Dept. of Urology, Freeman Hospital, Newcastle upon Tyne, United Kingdom[b]Sunderland Royal Hospital, United Kingdom[c]Dept.of Uro-Oncology, Freeman Hospital, Newcastle upon Tyne, United Kingdom

Introduction: Despite aggressive local therapy, patients with locally advanced bladder cancer are at significant risk for metastases. We evaluated the incidence of metastasis in T0 (no evidence of residual tumour) bladder cancer on the final cystectomy histological analysis in patients receiving neoadjuvant chemotherapy (NAC) and radical cystectomy (RC) versus RC alone.
Patients and Methods: From April 2004 – December 2006, 120 patients underwent a RC for muscle invasive bladder cancer. Amongst these patients, 66 (group 1) received NAC with three cycles of Gemcitabine and Cisplatin followed by RC. The remaining 54 patients (group 2) underwent a RC without NAC.
Results: All patients in both groups had muscle invasive disease diagnosed on initial resection (IR). The incidence of *cis* at initial diagnosis in group 1 was 10% (7/66) and group 2 was 8% (4/54). The mean duration for initial IR to RC in group 1 was 5.5 months (range 2.6 – 8.7) and group 2 was 2.5 months (range 0.2 – 5.8) ($p < 0.05$). A comparison of the final histology at RC and metastatic disease is summarized in Table 1.

Table for 128

	Group 1 (NAC + RC)	Group 2 (RC)	Mann-Whitney U test (p value)
T 0 histology on RC specimen (N/%)	21 (32%)	9 (16%)	NS
T1 – T4 histology on RC specimen (N/%)	45 (68%)	45 (84%)	NS
Cis on histology on RC specimen (N/%)	10 (16%)	16 (30%)	NS
Mean follow up (months)	64.6 ± 7.6	68.2 ± 7.3	NS
Incidence of metastatic disease in T0 (N/%)	9.5% (2/21)	22.2% (2/9)	NS
Incidence of metastatic disease in T1-T4 ± cis (N/%)	40% (18/45)	24% (11/45)	NS

Conclusion: The presence of T0 disease on final histology does not guarantee the risk of further metastatic disease despite neo-adjuvant chemotherapy. Longer follow up and larger patient numbers are required to validate this data further.

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Initial experience with a Randomised Controlled trial of Open, Robotic and Laparoscopic (CORAL) Radical Cystectomy

AF Ismail, O Elhage, P Rimington, JD Kelly, P Dasgupta, MS Khan
Guy's Hospital, London, United Kingdom

Introduction: Open radical cystectomy (ORC) is the gold standard for treatment of muscle invasive bladder cancer. Laparoscopic (LRC) and robotic assisted (RARC) have now emerged as viable alternatives to ORC. The relative benefits of one technique over another in the peri-operative and oncological outcomes, or long-term quality-of-life are not known. We report our initial experience in recruitment and randomisation for this trial.
Methods: All patients, 18–80 years, with muscle invasive bladder cancer or recurrent CIS, and fit for radical cystectomy with curative intent, were identified in a dedicated bladder cancer clinic and invited to participate. Exclusion criteria included T4 disease, upper tract involvement or metastases, previous major pelvic surgery and/or radiotherapy. Patients were operated and followed up in a single tertiary referral centre.
Results: 22 patients met the recruitment criteria, 17(78%) patients agreed to randomisation. Of 5 patients who declined, 4 chose RARC and 1 ORC. Of 17 patients, 5 were randomised to ORC, 8 to RARC and 4 to LRC. None of recruited patients have expressed regret in trial participation.

Conclusion: To our knowledge, this is the first three-arm trial in the world comparing ORC, RARC and LRC. Despite the increasing hype about new technologies, it is encouraging that such a randomised-controlled trial is still feasible. A national phase-2 and international phase-3 trial are planned.

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High MRE11 expression in muscle invasive bladder cancer is predictive of improved cause-specific survival following radical radiotherapy compared to surgery

TW Teo, A Choudhury, LD Nelson, S Chilka, S Bhattarai, AE Kiltie
St James's University Hospital, Leeds, United Kingdom

Introduction: In muscle invasive bladder cancer, radical radiotherapy and surgery achieve similar overall cure rates with no means of predicting individual patient response. MRE11 forms part of the MRN complex involved in the repair of lethal double strand breaks from radiotherapy treatment. The aim of this study was to assess whether MRE11 expression in tumour samples prior to irradiation could be used as a predictive marker of radiotherapy response.
Patients and Methods: MRE11 protein expression was studied by immunohistochemistry of pre-treatment tumour specimens from two cohorts of bladder cancer patients treated with radical radiotherapy from 1996 to 2000 ($n = 86$) and 2002 to 2006 ($n = 93$) and one cohort treated by cystectomy between 1996 and 2006 ($n = 88$) at the Leeds Teaching Hospitals NHS Trust.
Results: In the radiotherapy cohorts, high tumour MRE11 expression was associated with a better 3 year cancer-specific survival compared with low expression (68.7% versus 43.1%, $p = 0.011$ and 71.2% versus 43.0%, $p = 0.02$ respectively). MRE11 expression was not associated with cancer-specific survival in the cystectomy cohort ($p = 0.457$) consistent with MRE11 being a predictive marker for radiotherapy outcome. High MRE11 expression in the combined radiotherapy cohort had a significantly better cancer-specific survival compared with the high expression cystectomy cohort (69.9% vs 53.8% 3 year cause-specific survival, HR = 0.60, 95%CI: 0.39–0.93, $p = 0.021$).
Conclusion: High MRE11 protein expression is demonstrated to be predictive

of improved cancer-specific survival following bladder cancer radiotherapy compared to surgery. Future overall cure rates could be improved by patient selection for radiotherapy or cystectomy based on individual tumour MRE11 expression.

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A multicentre NCRI phase II study of hypofractionated conformal radiotherapy with concurrent gemcitabine in muscle-invasive bladder cancer

A Choudhury, R Swindell, J.P. Logue, A.E Kiltie, N.W. Clarke, R.A. Cowan
The Christie NHS Foundation Trust, Manchester, United Kingdom

Introduction: Chemo-radiation is recognised as providing higher cure rates than radiotherapy (RT) alone in the treatment of muscle-invasive bladder cancer (MIBC). This may be beneficial allowing better cancer control whilst preserving organ function. We conducted a phase 2 study combining weekly Gemcitabine with a 4 week course of RT.
Methods: Fifty patients were enrolled. All patients had T2/3 N0 M0 transitional cell carcinoma following transurethral resection and magnetic resonance imaging. Gemcitabine was given intravenously at 100 mg/m2 on D1, 8, 15 and 22 of a 28 day RT schedule delivering 52.5 Gy/20 fractions. Chemotherapy was stopped if RTOG grade 3 toxicity was reached for bowel or bladder. The primary endpoints were tumour response, toxicity and survival.
Results: All patients completed RT with 46 tolerating all 4 cycles of Gemcitabine. Two patients stopped after 2 cycles and 2 after 3 cycles due to bowel toxicity. Forty-seven patients had a post-treatment cystoscopy with 44 (88%) patients achieving a complete response. At median follow up of 36 months (15–62 months), 36 patients are alive, 32 with their bladder intact. Fourteen patients died, 7 from metastatic MIBC, 5 from intercurrent disease and 2 from toxicity. Four patients had cystectomy, 3 for recurrent disease and 1 for toxicity. One patient required a bowel resection due to late toxicity. Using Kaplan-Meier analyses, 3 year cancer-specific survival was 82% and overall survival, 75%.
Conclusions: Gemcitabine-RT is a well tolerated treatment in MIBC, with high rates of response and organ-sparing. It warrants further investigation in a phase III setting.

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Radiofrequency hyperthermia and mitomycin C for the management of frail patients with high-risk non-muscle invasive bladder cancer who fail intravesical BCG treatment

BE Ayres, A Connor, C Corbishley, MJ Bailey
St George's Hospital, London, United Kingdom

Introduction: Radical cystectomy is not always a viable option in patients with high-risk non-muscle invasive bladder cancer (NMIBC) who fail intravesical BCG. Hyperthermia plus mitomycin C (HT MMC) is a novel option.
Patients and Methods: Since October 2006, following case review by the specialist bladder cancer MDT, 27 high-risk NMIBC BCG failures, with multiple co-morbidities, received an 8 week induction course of HT MMC followed by 3-monthly maintenance HT MMC (Synergo®). During induction, 2 consecutive 30 minute cycles of 40 mg MMC in 50 ml were administered with concurrent heating of the bladder wall by a radiofrequency antenna to $42 \pm 2^{\circ}C$. For maintenance, patients received two 30 minute cycles of 20 mg MMC. All patients underwent cystoscopic follow-up, initially at 3 month intervals.
Results: 23 patients were male and the median age was 73 years (57–86 years). Median follow-up was for 15 months (2–39 months). Kaplan-Meier estimated disease-free survival rate was 70% after 12 and 24 months. No patients progressed to muscle invasion within the bladder but 3 patients had extravesical TCC (11%) – 1 prostatic stroma, 1 urethra and 1 renal pelvis. 2 patients died of other causes and 3 stopped treatment due to side effects (2 irritative symptoms, 1 allergy). 2 cystectomies, 1 diverticulectomy and 1 nephroureterectomy were performed for persistent disease.
Conclusions: Although radical cystectomy remains the gold standard treatment for BCG failures in high-risk NMIBC these results suggest that HT MMC may have a role in a sub-group of patients. The forthcoming randomised controlled HYMN trial will investigate this further.

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How do high volume centres achieve improved outcomes?

PJ Cathcart, J van der Meulen, ME Emberton
University College Hospital (UCH), London, United Kingdom

Introduction: Failure-To-Rescue (FTR) - death following an adverse event has been suggested as a valuable measure of outcome following cancer surgery. We evaluate to what extent FTR explains the volume-outcome relationship in patients undergoing radical cystectomy.
Methods: Using the Hospital Episode Statistics Database we identified all patients undergoing Radical cystectomy (7,850) in England for bladder cancer between 2002 and 2008. ICD-10 diagnosis codes and OPCS-4 operative procedure codes were employed to identify all adverse events following surgery. All index records were linked to national mortality records to enable reporting of 30-day postoperative mortality. Logistic regression models were used to assess the relation between hospital volume and FTR.
Results: Overall, 36.3% (2,848) of patients experienced an adverse event following surgery. Overall mortality following a complication was 4.9% (139/2848). Rates of FTR were highly dependent on the adverse event (e.g. Pneumonia – 9.6%, PE - 9.2%, MI – 24.2%, Renal failure – 7.6%). Increasing hospital volume was associated with improved rates of FTR (OR 0.99, 95% CI, 0.98–0.99, $p = 0.017$). Treatment at a high volume hospital appeared to decrease the odds of FTR following cardiac arrest (OR 0.98, 95% CI 0.97–1.00, $p = 0.09$), pneumonia (OR 0.98, 95% CI 0.98–1.00, $p = 0.08$) and operative adverse events such as post-operative bleeding and shock (OR 0.99, 95% CI 0.98–1.00, $p = 0.05$).
Conclusion: High volume centres performing radical cystectomy appear, at least in part, to achieve improved outcomes by reducing the risk of Failure-To-Rescue following an adverse event.

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Innovative Technique in Non-muscle Invasive Bladder Cancer – Bipolar Plasma Vaporization, a Reliable Approach?

P Geavlete, B Geavlete, M Jecu, R Multescu, D Georgescu, M Dragutescu
Saint John Emergency Clinical Hospital, Bucharest, Romania

Introduction: The aim of our study was to evaluate the efficacy and safety of a newly introduced endoscopic technique in the treatment of non-muscle invasive bladder tumors (NMIBT), the bipolar plasma vaporization of bladder tumors (BPV-BT).
Patients and Methods: Between May and October 2009, 57 consecutive patients presenting papillary bladder tumors over 1 cm underwent BPV-BT and a 3 months follow-up. Initial biopsy followed by plasma vaporization of the tumor and biopsies of the tumoral bed were performed in all cases. The follow-up protocol included abdominal ultrasonography, urinary cytology and cystoscopy at 3 months.
Results: BPV-BT was successfully performed in all cases. Multiple tumors were found in 45.6% and tumors over 3 cm in 50.9% of the cases. The mean tumoral volume was 11 ml. The mean operative time was 17 minutes, the mean hemoglobin decrease was 0.4 g/dl, the mean catheterization period was 2.5 days and the mean hospital stay was 3.5 days. There were no major intra or postoperative complications. The pathological exam diagnosed 57.9% pTa, 31.6% pT1 and 10.5% pT2 cases. No tumoral base biopsies were positive for malignancy. The recurrence rate was 15.7% for the 51 NMIBT patients, 9.1% for patients with single tumor under 3 cm and 17.5% in cases of single tumors over 3 cm or multiple tumors. Orthotopic recurrent tumors were encountered in 5.9% of the cases.
Conclusion: BPV-BT seems to represent a promising endoscopic treatment alternative for NMIBT patients, with good efficacy, reduced morbidity, fast postoperative recovery and satisfactory follow-up parameters.

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The clinical validity and inter-observer variability of the 2004 WHO bladder tumour classification assessed in a cohort with over 15 years prospective follow up

P Mariappan, P Fineron, M O'Donnell, RE Gailer, DJ Watson, G Smith, KM Grigor
Department of Urology, Western General Hospital, Edinburgh, United Kingdom

Introduction: Paucity of long-term outcomes using the 2004 WHO classification for papillary non-invasive bladder tumours and doubtful reproducibility precludes its use independent of the 1973 WHO classification. This study attempted to validate the prognostic value of the new classification and assess its concordance between tertiary centre uro-pathologists.
Patients and Methods: We used a prospectively followed-up, previously published (J Urol 177:867–875, 2007), cohort of non muscle-invasive bladder cancers (NMIBC) diagnosed between 1991–93. Initial grading by one senior uro-pathologist (pathologist A) used the 1973 WHO classification. Two other experienced uro-pathologists (B and C), blinded to previous grading, re-evaluated pathology slides using the 1973 and 2004 systems. Tumours were stratified by number, size and grade for outcome analysis.
Results: Of 370 NMIBC, 229 were staged non-invasive(pTa) with 89(38.9%), 109(47.6%), 31(13.5%) graded as grades 1, 2 and 3, respectively by pathologist A. Reclassification identified 4.3% PUNLMP (Papillary Urothelial Neoplasia of Low Malignant Potential), 84.2% LGUC (Low grade urothelial carcinoma) and 11.5% HGUC (High grade Urothelial Carcinoma). There was no recurrence or progression in the patients identified as PUNLMP by both uro-pathologists. Recurrence rates were 46.2% and 50.0% for LGPUC and HGPUC, respectively; while progression was seen in 3.9% and 10.0% of LGPUC and HGPUC, respectively. Size and number stratification further enhanced prognostic accuracy. Concordance between uro-pathologists B and C for the 2004 and 1973 classifications was good (Kappa = 0.69) and fair (Kappa = 0.25), respectively.
Conclusions: With good inter-observer concordance, the 2004 WHO classification of non-invasive bladder tumours appears to accurately predict recurrence and progression risks.

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Evaluating the role of FDG–PET/CT in patients with high-risk bladder cancer being considered for radical treatment

F Hughes, P Hughes, B Chappell, S Rankin, S Khan, T O'Brien
Guy's and St Thomas' Hospital, London, United Kingdom

Introduction and Objectives: Conventional techniques for detecting metastases in patients with high-risk bladder cancer are inadequate as 50% of patients relapse following cystectomy. Better tools for staging are required.
Material and Methods: Prospective study since February 2007, in a single network centre for bladder cancer. All patients considered for radical cystectomy underwent pre-operative FDG-PET/CT in addition to conventional imaging. FDG-PET/CT findings were correlated with iliac lymph node histology.
Results: 71 patients had FDG-PET/CT scans. Mean age 69 (range 39–84); 51 had T2 + disease, 20 had recurrent high-risk non-muscle invasive disease. 12 patients did not undergo cystectomy: FDG-PET/CT showed distant disease in 7, and 2 had additional primary cancer identified. 3 were unfit/declined surgery.

59/71 proceeded to cystectomy, of whom 50 had iliac nodes identifiable on histology. FDG-PET/CT was positive in 10/50 patients: (7 iliac nodes, and suggested 3 distant metastases). 5/7 positive iliac nodes correlated with cancer histology: 1/7 received neo-adjuvant chemotherapy, 1/7 was negative but relapsed at 20 months.

Of the remaining 40/50 patients who had node dissection: 5 false-negative FDG-PET/CT. Sensitivity for predicting nodal disease was 50% with 95% specificity, comparing favourably with CT which was 36% and 84% respectively.

FDG-PET/CT alone correctly identified either iliac or distant disease in 7/59 (12%) patients undergoing cystectomy.

Negative FDG-PET/CT was associated with recurrence in 16 % (6 patients), while a positive scan had a 40% (4 patients) recurrence (Mean follow-up 8 months (1–22 months)).
Conclusion: FDG-PET/CT can improve staging and management of high-risk bladder cancer, and identify occult disease in around 12% of patients.

BJUI SUPPLEMENTS

Wednesday 23 June
Paper Session C

14:00 – 16:00 Charter 3,4,5
STONES/IMAGING/UPPER TRACT DISORDERS
Chairmen: Mr Adrian Joyce & Professor Palle Osther
Papers 158–169

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Is Pre-op Imaging for Ureteric Calculi Unnecessary?

FR Youssef, B Wilkinson, KJ Hastie, J Hall
Royal Hallamshire Hospital, Sheffield, United Kingdom

Introduction: Up to date imaging is essential prior to intervention for ureteric calculi. The aim of this study was to identify the patients not requiring ureteric stone surgery based on pre-operative imaging on the day of surgery.
Methods: All Rigid Ureteroscopy (URS) patients from June 2008 until June 2009 were identified. Diagnostic imaging from presentation was reviewed, and any additional imaging prior to surgery. All patients underwent KUB x-ray, NCCT or both on the day of surgery.
Results: 96 patients were listed for URS for ureteric calculi. Sizes ranged from 3–20 mm. In 27 cases, stones were radiolucent, but seen on NCCT at diagnosis. These patients had NCCT on the day of admission. Pre-operatively, 58 patients had plain KUB, 28 had NCCT, 10 had both.

13 patients (13.5%) were cancelled as no stone was identified on pre-operative imaging. In the cancelled group, stone sizes ranged from 3–10 mm.

Patients with radiolucent stones (27), all had NCCT on admission. Of these; 4 had their surgery cancelled on the day.

Patients with radio-opaque stones (69), 12 required NCCT on admission, 4 of these were cancelled.

Patients with radio-opaque stones (69), 9 were cancelled due to negative pre-operative imaging; 5 had plain KUB, 3 had plain KUB & NCCT, 1 had NCCT only.

Conclusion: Pre-operative imaging is essential in ureteric stone surgery avoiding unnecessary anaesthetics and urinary tract instrumentation. 61.5% of patients cancelled were as a result of their NCCT.

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Value of CT urograms in high risk patients with unexplained haematuria

S M Patel, S Jallad, T Wah, S Jain
St James's University Hospital/Leeds teaching Hospitals, United Kingdom

Introduction: CT Urograms (CTU) are increasingly being used as a routine investigation for unexplained frank haematuria in high risk patients following negative renal ultrasound and flexible cystoscopy findings. This practice follows the referral guidelines recommended by the Royal College of Radiologists, as detailed in "Making the Best Use of Clinical Radiology Services (MBUR) 6th edition". In 2004, CTU replaced the use of Intravenous Urography (IVU) in our hospital. We carried out an audit to determine the value of CTU.
Patients and Methods: We retrospectively identified high risk patients, i.e. those greater than 45 years of age, with frank haematuria who attended the haematuria clinic between September 2008 and September 2009. Patients with a negative ultrasound scan and flexible cystoscopy were subsequently investigated with a CTU to assess the upper urinary tract.
Results: A total of 146 patients were identified (105 males, 41 females). Of the 146 patients, 4 (2.73%) had urological malignancy; 2 (1.36%) had upper tract TCC and 2 (1.36%) were reported to have bladder TCC, one of which was in a bladder diverticulum. 18 were diagnosed with urinary calculi. There were other non-urological findings of importance, namely 5 patients were identified with aneurysms, 7 with gynaecological pathology, and a further 14 with general surgical findings.
Conclusion: Upper tract tumours were detected in 1.36% of patients following CTU. Additionally, CTU detected bladder tumours (1.36%) not seen on flexible cystoscopy. Our findings show that it is worth investigating high risk patients presenting with frank haematuria with a CTU.

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Is an X-ray KUB (plain film) necessary along with an unenhanced CT KUB as a primary imaging modality in acute renal colic?

AS Sacco, G Mukerji, A Kazmi, A Rafique, A Raza
Ealing Hospital, London, United Kingdom

Introduction: CT KUB is the gold standard for detection of urinary tract calculi. X-ray KUB is used for follow-up due to a reduced radiation dose. If an X-ray KUB is not performed at the same time as the CT KUB, subsequent follow-up may be difficult as there is no reference film for comparison.
Patient and Methods: A Consultant Urologist and Radiologist independently assessed the CT KUB, CT scout film and X-ray KUB (both performed on the same day) for 105 patients presenting with acute renal colic. Images were assessed for the presence of stones, stone size, location, multiplicity and stone density in Hounsfield Units (HU).

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Results: 57.1% of stones were left sided, 57.2% were multiple, 67.6% were < 5 mm in size, 27.6% between 5–10 mm and 4.8% > 10 mm. 40.9% were in the distal ureter, 31.4% in the proximal ureter. There was no significant difference between the CT scout film and X-ray KUB in the detection of calculi (summarised in Table). Stones missed on CT scout film had a significantly lower HU (361.8 vs 561.9HU, P = 0.0001).
Conclusion: CT scout film and X-ray KUB are equivalent in detecting calculi regardless of stone size, location and the Specialist reviewing the imaging. The CT scout film can therefore be used as a reference for subsequent KUB films, avoiding the need for an initial KUB film at presentation.

Table for 160

Stone size	Seen on X-ray KUB n(%)		Seen on CT Scout n(%)	
	Yes	No	Yes	No
< 5 mm	42 (59.1%)	29 (40.9%)	41 (57.7%)	30 (42.3%)
5–10 mm	26 (89.7%)	3 (10.3%)	27 (93.1%)	2 (6.9%)
> 10 mm	5 (100%)		5 (100%)	

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Ureteric stone disease imaging – UK practice 2009
BA Wilkinson, FR Youssef, PA Spencer, J Hall, KJ Hastie, BT Parys
Royal Hallamshire Hospital, Sheffield, United Kingdom

Introduction: The imaging modality of choice for ureteric colic is non contrast computerised tomography-kidneys, ureters and bladder (NCCT-KUB). Guidelines for follow-up of radiolucent calculi suggest 'periodic' imaging but with no modality advised. Availability of CT scanning appears variable especially prior to ureteroscopy (URS). This study aimed to establish current imaging practice in the UK.
Methods: A BAUS section of Endourology sponsored postal survey was sent to all UK BAUS registered consultants to establish:

1. The utilisation and availability of NCCT-KUB in the diagnosis of ureteric colic.
2. The imaging modalities used in the follow up of radiolucent calculi.
3. Type of preoperative imaging used immediately prior to URS.

Results: 225 (31%) questionnaires were completed. In the diagnosis of ureteric colic the tests employed are; NCCT-KUB 70%, IVU 27%, other 3%.

NCCT-KUB was the commonest modality used for follow up of radiolucent calculi 35%, USS 18%, and other 47%. Imaging varied for site and size of stone.

On the day of URS for radio-opaque stones 75% perform a KUBXR, 5% occasionally and 17% never.

In pre-op imaging for lucent calculi only 38% perform a NCCT-KUB on the day of surgery.
Conclusions: Literature evidence shows that NCCT-KUB is the investigation of choice for ureteric calculi, however only 70% of UK urologists use this test. Imaging modalities used in radiolucent stones follow-up are variable and correlate with stone size and site. On the day of surgery, up to date imaging is not always performed, this has morbidity, quality and cost implications.

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Bouin's fixative improves preservation of morphology of ureteroscopic biopsies
MF Bultitude, K Ghani, C Horsfield, A Chandra, K Thomas
Guy's and St. Thomas' Hospital NHS Trust, London, United Kingdom

Introduction: Ureteric biopsy specimens are frequently small making them hard to identify in the container. Often the cytological detail is poor and therefore difficult to interpret.
Patients and Methods: To overcome this issue we used Bouin's solution instead of 10% Formalin for consecutive patients undergoing ureteric biopsy from October 2009 (Group A). These were analysed by the study Consultant Pathologist. Group A was compared with consecutive ureteric biopsies prior to October 2009 kept in formalin (Group B). Another Consultant Pathologist blinded to the type of solution used was shown all specimens and asked to comment on tissue quality and preservation of cytological details.
Results: Standard ureteroscopic biopsy technique was performed. Indications: Known upper tract TCC surveillance; Incidental ureteric stricture; positive selective cytology; abnormality on CT. The quality of the pathology is reflected in the results:

Table for 162

Biopsy Location	Macro description	Histopathology
Distal-ureter	tiny < 1 mm	LG G2 pTa
PUJ	v.tiny < 1 mm	LG G2 pTa
Renal Pelvis	3 mm	G3pTx
Mid-ureter	2 < 1 mm	G1pTa
Distal-ureter	3 < 1 mm	HG G2pTa
Distal-ureter	max 1 mm	G3pT2
Distal-ureter	3 mm	LG G2pTa
Mid-ureter	max 2 mm	G3pTx
Distal-ureter	1 mm, < 1 mm	G1pTx
Mid-ureter	1 mm	Flat mucosa. Oedematous lamina propria. Mild inflammation

The study pathologist commented on the good preservation of nuclear morphology.

The blinded pathologist picked biopsies from Group A as having better architecture and cytological detail with no equivocal specimens compared with Group B.
Conclusion: Preservation and storage of ureteric biopsies in Bouin's solution appears to make specimens easier to identify and preserves the nuclear detail facilitating more accurate pathological assessment. Fixation in Bouin's was preferred by both pathologists.

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Ureteroscopic management of upper tract TCC: 5 year follow-up
MF Bultitude, EF Malik, N Hegarty, J Glass, K Thomas
Guy's and St. Thomas' Hospital, London, United Kingdom

Introduction: Previously we reported a series of patients with upper tract TCC managed initially with ureterorenoscopy. We report outcomes of these patients at 5 years.
Methods: 28 patients with upper tract TCC were managed at our institution and their initial management reported in 2006. These patients have now reached a minimum of 5-years of follow-up. By analysing their hospital records we have determined the outcome on this cohort of patients.

Results: The median age of the series at diagnosis was 70 years (27–89). 20 males; 8 females. Initial pathology was: G1pTa(9); G2pTa(7); G3pTa(2); pTx/Not biopsied(8); Malignant(2). The location of the tumours were renal(14); ureteric(12); both(2).

7 patients required surgical management: Nephroureterectomy(5); Partial nephrectomy(1); Upper ureterectomy(1).

4 patients were managed with palliation alone. 1 declined nephrouretectomy–he died of metastatic TCC at 5 years.

A further 2 patients were unfit for surgical excision but were managed endoscopically for 5 and 6 years respectively before death.

2 patients with imperative indications were managed endoscopically and died of TCC at 4/5 years respectively.

13 patients have been managed successfully. 6 are clear of TCC at last surveillance at 7/7/7/6/5/5 years respectively. 2 have occasional recurrences but remain controlled at 4 (referred back) and 8 years. 3 were clear at 3/2/2(referred back) years but have not been followed at our institution since. 2 were clear at 1 year but were referred back to original hospital.

Conclusion: In select patients with low grade TCC or with an imperative reason for endoscopic management, long-term cancer control can be achieved with close surveillance.

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Redefining the Limits of Flexible Ureterenoscopy

M Hussain, P Acher, M Cynk
Maidstone Hospital, Maidstone & Tunbridge Wells NHS Trust, United Kingdom

Introduction: Flexible ureterorenoscopic holmium laser lithotripsy allows retrograde management of renal calculi that previously required alternative strategies. This study assesses the influences of stone size, density and location on treatment outcomes from a large series.

Patients and Methods: Data concerning patients who presented for ureterorenoscopic laser lithotripsy between May 2005 and September 2008 were prospectively collected. Single-treatment success was defined as: satisfactory visual clearance; radiological absence of calculi; and no further treatment.

Results: 185 patients had 236 treatments (mean $\pm$ SD age = 53.6 $\pm$ 14.6 years). Overall success rate was 90.7%. The mean $\pm$ SD stone size was 13.1 $\pm$ 8.5 mm with significant differences between the successful (11.6 $\pm$ 6.7 mm) and non-successful (27.8 $\pm$ 10.0 mm) outcome groups ($p < 0.0001$, unpaired t-test). 96.5% of treatments for stone size $\leq$20 mm were successful. Of 36 patients with stone size $>$20 mm, 21(58.3%) were stone-free after one treatment, and 31(86.1%) after two. Hounsfield Unit data did not differ significantly between the groups (mean $\pm$ SD 858 $\pm$ 388 vs. 1115 $\pm$ 643, $p = 0.146$, unpaired t-test). Stone locations were: renal pelvis, calyceal diverticulae, and upper, mid and lower poles in 61, 9, 24, 27 and 115 cases with success rates of 85%, 100%, 83%, 93% and 94% respectively ($p = 0.899$ $\times 2$ test).

Conclusion: Stone density and location do not influence outcome. Stones sized $>$20 mm may be treated but often require extra sessions.

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The safety and efficacy of percutaneous nephrolithotomy (PCNL) for the treatment of renal stone disease in the paediatric population

M B K Shaw, D J Thomas, S T Hassan, P Haslam, R Williams
Freeman Hospital, Newcastle upon Tyne, United Kingdom

Introduction: Percutaneous nephrolithotomy (PCNL) is a well-recognised treatment for renal tract stone disease in adults. It is less commonly used in children, at least in part due to the perceived risk of major complications in smaller kidneys. We assess the outcome of conventional PCNL in children performed in our institution.

Methods: A retrospective review of the case notes of all patients aged less than 18 years undergoing PCNL was performed between 2000 and 2009. Demographic information and details of stone clearance and complications was collected.

Results: 32 primary PCNL in 31 children were performed. The mean age at surgery was 10.8 years (range 2.8 to 17.9 years). Twenty six procedures were performed with a single puncture, 6 required 2 punctures. The mean calculus diameter was 19 mm (range 5 to 40 mm). Surgery was performed for staghorn stones in 11 cases, multiple stones in 10 cases and single stones in 11 cases. Overall, 27 patients were stone-free after the primary PCNL, 2 required supplementary ESWL and 3 had a second PCNL. Only 1 patient had a residual stone fragment and this was managed by ongoing ultrasound monitoring with no further intervention at 12 months. Four patients developed post-operative pyrexia lasting $<$24 hours. No bleeding complications were encountered.

Conclusion: PCNL in the paediatric population is a safe and effective procedure, producing excellent stone clearance with minimal complications. It does require the involvement of an experienced multi-disciplinary team.

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An audit of Percutaneous Nephrolithotomies (PCNLs) based on the BAUS endourology section PCNL proforma (2007)

AC Christofides, SJ Bromage, AC Cowie, J Hussain, CD Betts
Salford Royal University Hospital, Manchester, United Kingdom

Introduction: There is limited audit data from the UK regarding PCNLs. Also, the optimum number of PCNLs per year to achieve satisfactory results is unclear.

Patients and Methods: Data was collected using a modified BAUS (2007) PCNL proforma. In all cases, renal access was undertaken by a single uroradiologist and one urologist was the main operator or assistant. Access was achieved using ultrasound and fluoroscopy with balloon dilatation.

Results: Between 2004–2009, 118 PCNLs were performed. The number per year was 20–24. Mean age was 54 and 73% were overweight/obese. Only 62% had a urine culture in the month before surgery. Six patients had urinary diversions, 4 had solitary kidneys and 4 had previous pyeloplasties. Stone sites were; renal pelvis 42, partial staghorn 26, calyceal 17, complete staghorn 5 and other 21. 70% of stones were greater than 2 cm and none less than 1 cm. All but 2 patients had a single tract. Access was subcostal in 78% of cases. Access failure was 3.3%. Overall clearance following first PCNL was 75% and this varied from 95% (renal pelvis) to 0% (complete staghorn). Ten patients had 2 PCNLs. Complications included pyrexia (19%), sepsis (1.6%), and transfusion (0.8%). Stone composition was; 38% calcium

oxalate/calcium phosphate, 19% calcium oxalate, 19% calcium phosphate/magnesium ammonium phosphate, 6% cystine, 4% urate and 14% other.

Conclusion: Satisfactory PCNL results are achievable with a caseload of 20–25 PCNLs per year.

Complete staghorn stones are relatively uncommon and a few centres should develop a specialist interest in their management.

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Percutaneous Nephrolithotomy in the Extended Lithotomy Position – A New Approach to an Old Problem?

JA Bycroft, S Pridgeon, D Yu, N Woodward, A Goode, L Ajayi
Royal Free Hospital, London, United Kingdom

Introduction: Percutaneous Nephrolithotomy (PCNL) is conventionally performed in the prone position. We reviewed our experience of performing PCNL in the extended lithotomy position.

Methods: A prospective evaluation of 38 consecutive patients undergoing PCNL in the extended lithotomy position was undertaken. Patients with inaccessible stones underwent simultaneous retrograde stone manipulation with flexible ureterorenoscopy. Stone clearance was assessed with non-contrast CT (CT-KUB).

Results: Stone clearance was achieved in 32 patients (84%) on CT-KUB. The stone was inaccessible in 1 patient, 2 had partial clearance and 3 patients had fragments <2 mm in diameter. The mean Body Mass Index (BMI) was 32. The mean pre-operative stone burden measured 24.5 mm (12–40) in diameter with 8 staghorn calculi. 11 patients underwent simultaneous antegrade and retrograde procedure (flexible ureterorenoscopy). The mean operative time was 83 minutes. The mean screening time was 10.5 minutes and the mean radiation dose was 188 mGy. 8 patients required ureteric stenting as part of the procedure. The mean hospital stay was 2.3 nights and no major complications were encountered in this series.

Conclusion: PCNL in the extended lithotomy position is safe and effective. It facilitates simultaneous flexible ureterorenoscopy and removes the need for a second percutaneous renal access for complex stones. It negates the need to turn the patient once anaesthetised. It may reduce anaesthetic issues such as cardio-respiratory compromise seen in the prone position. Patient benefits include a comfortable position, lack of major complications (in our series) and good stone clearance rates. We would advocate the extended lithotomy position in centres performing PCNL.

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Nephron sparing surgery for large distal ureteric transitional cell carcinoma

A S Parnham, R Kavia, E Havranek, S Robinson, H Motiwala
Wexham Park Hospital, Slough, United Kingdom

Introduction: The standard surgical treatment of distal ureteric transitional cell carcinoma (TCC) remains nephroureterectomy. Nephron sparing surgery such as ureteroscopic management or segmental ureterectomy is indicated for those with multiple co-morbidities, a functionally solitary kidney or renal insufficiency to avoid the risk of dialysis and the profound impact upon quality of life and life expectancy. We present a consecutive series of 16 patients who were managed with open distal ureterectomy and Boari flap reconstruction as an alternative means of preserving renal function in large distal ureteric TCC.

Patients and Methods: We looked at all patients operated on by a single surgeon between 2004–2009.

Results: We treated 11 men and 5 women with a mean age of 71 years (Range of 55–88 years). The mean follow up was 2.5 years (range - 0–5.5 years) with only one patient with a recurrence at 2.9 years. The mean change in eGFR was $+0.49$ mL/min (range -15.22 mL/min and $+15.78$ mL/min). There was one complication with testicular atrophy.

Conclusion: This is the largest series worldwide compared to published literature. We have shown that this operation has minimal impact upon renal function and none of our patients went on to require renal replacement therapies. Early results suggest distal ureterectomy and Boari flap reconstruction has favourable recurrence rates, morbidity and mortality to other nephron sparing approaches which are indicated in patients with renal compromise or multiple co-morbidities.

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Google Ureteric Stent Register

PJSC Charlesworth, MAW Miller, PVS Kumar
Northampton General Hospital, United Kingdom

To avoid retained ureteric stents the use of an electronic Stent Register is widely recommended as best practice, however their implementation is often difficult unless a bespoke system is built.

We have designed a simple way of using Google Calendar (http://www.google.com/calendar) to work as a departmental stent register. Using Google Calendar's built-in functions, we have created a web-based stent register. Date of stent insertion and estimated removal/exchange date can be entered from any computer, and an automatic email reminder is sent to an administrator near the required removal/exchange date. The administrator can then check that the planned procedure has been arranged. Subsequent stent removal can then be logged by the health professional performing the procedure, and the system intermittently interrogated to check that no retained stents remain.

After obtaining the appropriate data protection and legal permissions to use this system, we have been monitoring ureteric stents in our hospital for 6 months. Over this time 72 stent insertions have been logged into the register, 47 have been removed with a median delay of $+2.4$ days (range -10 to $+14$). The remaining 25 stents have expected removal dates logged in the register (<6 months). A second stent register, using the same methodology, has also been initiated at a neighbouring trust, with subsequent data to follow.

This system allows all stent insertions, exchanges and removals to be monitored, checked and audited. It can be set-up in a matter of minutes, is user-friendly, and is completely free.