Tuesday 24 June 14.30–15.30
Poster Session 4: Urinary Calculi
Chairmen: N. Burgess and K. Hastie

P031

Can renal protocol CT be interpreted by the urologist?

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INTRODUCTION

Despite potential advantages, unenhanced spiral CT has not yet replaced IVU within the British Isles as the investigation of choice for patients with acute urolithiasis. In this initial study, we examined the accuracy of interpretation of CT scans by urologists, in the setting of acute ureteric colic.

PATIENTS AND METHODS

One hundred patients presenting to the emergency department with suspected ureteric colic and evaluated with unenhanced spiral CT were retrospectively reviewed. A subgroup of 32 patients, randomized for reporting by one consultant radiologist, were selected for blinded review, initially by a first-year registrar and subsequently by a consultant urologist (neither of whom were sub-specialised in uroradiology or endourology). The acute presentation details were presented to mimic the emergency situation.

RESULTS

Urinary calculi were reported by the consultant radiologist on 58 films, with extra-urinary abnormalities in 17. In the subset of 32 films blindly reviewed by urologists, all 18 stones reported by the radiologist were positively identified. Four of five additional urinary abnormalities were identified (a suspected horseshoe kidney was not diagnosed by either urologist), and a further three of six extra-urinary abnormalities detected. In two scans reported as normal by the radiologist, a calculus was suspected by both urologists, and was confirmed on subsequent IVU in one patient.

CONCLUSION

Unenhanced spiral CT is an effective diagnostic tool in patients with suspected acute urolithiasis, allowing the urinary tract to be easily and reliably evaluated by the urologist, thereby facilitating the acute management of these patients.

P032

The management of upper tract urological stone disease

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INTRODUCTION

This survey aims to gain information about the management of upper tract stone disease in the UK and Ireland, specifically relating to levels of staffing, availability of equipment and access to investigations.

METHOD

Information was collected via a postal questionnaire which was initially sent to all full BAUS members and then resent to targeted nonresponders. The questionnaire was also made available on the BAUS website.

RESULTS

Of the 574 questionnaires sent, 197 were completed and returned, representing 143 urology centres, 68% of the total in the UK and Ireland. All 12 regions were represented. Of the respondents, 52% work in centres with 1–3 urologists, with only 10% working in large centres with ≥7 urologists. There was no correlation between the number of urologists (range 1–12) and uroradiologists (range 0–5) per centre. Equipment availability varies widely; 88% have a lithoclast, 73% a flexible ureteroscope but only 24% have on-site fixed ESWL. There was marked variation in the rapidity of urgent and routine investigations for stone disease. For urgent inpatients 95% have same-day plain X-ray, but only 56% have same-day IVU. For routine investigations many urologists wait for >3 months (plain film 4%, IVU 16%, ultrasonography 23%).

CONCLUSION

These results highlight current disparities in the management of upper tract stone disease between urology centres in the UK and Ireland. It is hoped this information will be useful in the future planning of urological stone services.

Funding: Survey performed on behalf of BAUS Section of Endourology Audit and Data Sub-committee

P033

Improving the outcome in the minimally invasive management of paediatric stone disease

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INTRODUCTION

With 15 years' experience of treating paediatric stone disease, patient selection and management are reviewed. Initial treatment was reliant on ESWL monotherapy [*J Urol* 2001; 165: 2324–7) but has been replaced by percutaneous nephrolithotomy (PCNL) for larger stones.

PATIENTS AND METHODS

From a wide range of paediatric sources, patients were referred to a unit dealing with adult stone disease. The initial treatment selection for patients aged 11 months to 15 years was based on radiographic findings, clinical information and access to paediatric anaesthesia. The Wolf 2300 and Dornier Compact lithotripters were used. For ureteroscopy, a semirigid 6.5 F ureteroscope and electrohydraulic, pulse-dye or holmium lithotripsy was used. After percutaneous surgery a 10 F nephrostomy was placed. Audit, equipment changes and clinical developments defined three stages, i.e. 1988–92, 1993–97 and 1998–2002.

RESULTS

In all, 150 children were referred, with 179 renal units treated by ESWL, ureteroscopy and PCNL in 22, three and two, 47, 21 and nine, and 32, 12 and 32, in the three respective periods. Those with larger stones (> 20 mm) are offered PCNL as the primary treatment, whilst the use of ancillary treatments remained similar among the groups. The re-treatment rate decreased from, e.g. 45% to 22% for ESWL, and the overall complication rate decreased from 15% to 10%.

CONCLUSION

Developing a strategy for the safe and effective management of paediatric stones requires the availability of a full range of techniques. Our present protocol avoids ESWL monotherapy for larger stones and there were fewer re-treatments and fewer complications without compromising stone-free rates.

P034

Management of stuck and encrusted ureteric stents

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INTRODUCTION

One of the most serious complications of ureteric stents is encrustation, which pose a challenging problem for removal. Current published series consist of only a few cases.

PATIENTS AND METHODS

Since 1999 we have treated 40 patients with 48 stuck and encrusted stents; for this analysis an encrusted stent was one that required some form of intervention above the ureteric orifice to remove it. Lower-end encrustations were excluded.

RESULTS

The mean (range) time that the stents had been *in situ* was 5.7 (2–18) months; 36 of the stents had been in for ≤6 months. Multimodal treatments were used, i.e. open in one, percutaneous nephrolithotomy (PCNL) in five, ureteroscopy in 27 (rigid or flexible with electrohydraulic lithotripsy, lithoclast or holmium laser), ESWL and ureteroscopy in 10, ESWL and cystoscopy in four, and in one the removal failed. The mean number of procedures per patient was 2.2.

CONCLUSION

Many procedures are often required to remove encrusted stents. ESWL and ureteroscopy are used primarily, resorting to

PCNL if these fail. Often patients require the insertion of a second stent alongside the original. Patients with a large amount of encrustation or a large concurrent stone load may primarily require PCNL. Open removal is reserved for rare cases when the above procedures fail. The common assumption is that stents only become stuck if left in for too long; 75% of stents in this series encrusted within 6 months and as a result we would recommend that stents in stone-formers should be changed every 3 months.

P035

The impact of an electromagnetic lithotripter on the management of primary ureteric stones

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OBJECTIVE

To assess the effectiveness and the effect of an electromagnetic lithotripter (Compact Delta, Dornier, Germany) on the management of primary ureteric stones.

PATIENTS AND METHOD

All patients with primary ureteric stones treated at a tertiary urological centre using this lithotripter between January 1999 and January 2002 were reviewed retrospectively. The effectiveness of the lithotripter and reason for failures were assessed.

RESULTS

In all, 137 patients with primary ureteric stones underwent ESWL. The stones were in the upper (74), middle (37) and lower (26) ureter respectively; the complete clearance rate at 3 months was 86%, 79% and 79%, respectively and 20%, 27% and 10% of the patients, respectively, required re-treatment on more than two occasions. In 26 patients the treatment failed and they underwent ureteroscopic or antegrade removal. Stone size was the only significant factor correlating with failure. The mean size of stones in the successful group was 12.2 mm, compared with 17.3 mm in the failures. The likelihood of success after a third session of ESWL was 13.4%. Complications included haematuria, steinstrasse, colic, UTI and petechial haemorrhage, in 54 patients. One patient developed pyonephrosis and subsequently required nephrectomy.

CONCLUSION

An electromagnetic shockwave lithotripter using the EMSE150 shock wave emitter in the *in situ* treatment of primary ureteric stones is effective, providing strong competition to the assumption that electrohydraulic shockwave treatment is more powerful than electromagnetic. Some patients with stones of >12 mm are likely to have a higher re-treatment rate, more auxiliary procedures and complications. Having failed a second treatment session, the method of management should be changed to endourological intervention, as the likelihood of a successful outcome after third session of ESWL is dismal.

P036

A single-centre, retrospective study comparing urinary stone treatment outcome using piezoelectric, electrohydraulic and electromagnetic shockwave lithotripters

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INTRODUCTION

We compared the treatment efficacy for patients attending a single centre for shockwave lithotripsy (SWL) by the same team using either the Wolf Piezolith 2300 (piezoelectric, PZ), Dornier MPL9000 (electrohydraulic, EH) or Dornier Compact Delta (electromagnetic, EM) lithotripters from January 1992 to June 2002.

PATIENTS AND METHODS

In all, 3163 (1449 PZ, 780 EH and 934 EM) solitary, radio-opaque urinary stones of ≤15 mm in adult patients receiving primary SWL were identified. Stone-free status was defined as the absence of radiological evidence of a stone. Treatment outcomes were assessed by the stone-free rate at 3 months after one treatment session (SF3m), re-treatment rate (reT) and auxiliary procedure rate (AUX).

RESULTS

The patients' characteristics were similar for the three groups. There were significantly fewer ureteric stones in the PZ group. The mean stone sizes were 7.76 mm (PZ), 9.26 mm (EH) and 8.03 mm (EM), and the differences

Outcome	PZ	EH	EM
Number	320	127	161
%SF3m	48.4	55.1	32.3
%ReTx	38.4	25.2	36.6
%AUX	3.1	3.8	5.0

were statistically significant ($P < 0.001$). The largest single stone group (lower calyceal stone of 6–10 mm) were selected for further analysis

SF3m was significantly poorer for EM ($P < 0.001$) while the other two were similar; ReT was significantly less for EH ($P < 0.05$) but there was no difference for AUX among the groups.

CONCLUSION

The Dornier MPL9000 had the best treatment outcome for SF3m and ReT among the three lithotripters for lower calyceal stones. New technology does not necessarily result in a better outcome!

P037

Percutaneous surgery for calyceal diverticulum and deep lower-pole renal stones: do we improve the quality of life?

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INTRODUCTION

The treatment of a calyx diverticulum and deeply secluded lower-pole stones is controversial. Small calyceal and diverticular stones may cause more symptoms than previously anticipated. Treatment often yields frustrating results and ESWL is not an option. The question arises whether and when to treat them; 89% of these stones will eventually require intervention within 10 years. What are the goals of treatment and how do these affect the patients' quality of life?

PATIENTS AND METHODS

Eighteen patients were asked to complete a standardized validated questionnaire (SF-36) before and 6 weeks after PCNL.

RESULTS

PCNL rendered 15 patients completely stone-free. The most significant findings for quality of life were a reduction in symptoms interfering with performance at work in seven of patients, improved general health in six, an increase in the feeling of accomplishment in four, and a reduction in interference with social activities in five. There were increases in general performance and concentration (three each). Of three patients with severe pain, only one was left with the same pain after PCNL.

CONCLUSIONS

Because of the difficult access, PCNL of a calyx diverticulum and secluded lower-pole stones are without doubt challenging. Whereas stone-free status could still be achieved in most cases, this was only technical. At the most, less than half of patients subjectively benefited from the procedure, and hence patients should be made aware of the limited impact of surgical treatment on quality of life. Asymptomatic patients can be given the option of a watchful waiting approach.

P038

Cystine stones: a challenging group of stone formers

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INTRODUCTION

Cystinuria is an autosomal recessive, metabolic condition affecting 1 in 10 000 people and that may be caused by a defect in the *rBAT* gene on chromosome 2. Cystine stones account for 1% of all renal calculi and these patients are a challenging subgroup to manage. These stones can be difficult to visualise on X-ray, having a ground-glass appearance, and are considered to be resistant to ESWL.

PATIENTS AND METHODS

We present a series of 21 patients (12 men and nine women, mean age 38.2 years, range 20–64) with cystine stones seen in our unit over a 4-year period; their

operative and medical management is reviewed.

RESULTS

Previous interventions included 11 open surgical procedures, 12 percutaneous nephrolithotomies (PCNL) and six ureteroscopies; five were managed conservatively while 16 required surgical intervention, with a total of 23 stone episodes (19 treated successfully to date). These comprised flexible ureteroscopy in seven (six holmium laser and one electrohydraulic lithotripsy), rigid ureteroscopy in one (Lithoclast), PCNL in six (two required ESWL), ESWL alone in four and PCNL/flexible ureteroscopy/ESWL in one. Four treatments are ongoing; in eight of 12 patients who underwent ESWL it was judged to be successful. All patients are jointly managed by the renal physicians. Medical management predominantly involved maintaining a high fluid intake and urine alkalinization (sodium bicarbonate or potassium citrate) with penicillamine, μ-MPG or captopril as second-line treatments.

CONCLUSION

Cystinuric patients are a difficult group to manage; from this series, ESWL and flexible ureteroscopy with laser fragmentation are valuable treatments and help to avoid more invasive techniques.

P039

Probiotic bacteria: a role in stone disease?

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INTRODUCTION

Low levels of *Oxalobacter formigenes*, an oxalate-metabolizing bacteria, may be important in the cause of calcium oxalate stone disease. However, *O. formigenes* is a potential pathogen and can cause intestinal discomfort and diarrhoea when present in large amounts. We investigated the ability of bacteria found in probiotic yoghurts (*Lactobacillus acidophilus* and *Bifidobacterium animalis*) to metabolise oxalate. These were chosen as neither are pathogenic, but they are easily available and colonize the gut.

MATERIALS AND METHODS

Freeze-dried bacteria, used for yoghurt production, were grown as starter cultures. These cultures were incubated for 3 days in micro-aerophilic conditions at 30°C; 10 μL of each culture was innoculated onto Man, Rogosa, Sharpe (MRS) broth under similar conditions. The final bacterial concentration produced was 3.6×10^4/mL, to which 5 mmol/L of ammonium oxalate was added. The oxalate concentration was measured after 24 h of incubation. A medium blank of broth and oxalate was prepared and used as a control for the oxalate analysis.

RESULTS

L. acidophillus had a significantly greater ability to degrade oxalate than *B. animalis*. Both bacteria were able to grow in an oxalate environment. The mean final oxalate concentration and mean percentage change in concentration for *L. acidophillus* and *B. animalis* were 4.3 and 4.6 mmol/L, and 14% and 8% ($P = 0.009$, *t*-test), respectively, compared with the control, at 4.7 mmol/L and 6.4%.

CONCLUSION

L. acidophilus is able to grow in an oxalate-rich environment and to degrade oxalate. *L. acidophilus* may have a role in the management of hyperoxaluric stone disease.

P040

Effect of an acute load of six soft drinks on urinary stone risk factors

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INTRODUCTION

Patients with stones are generally advised to drink plenty of fluid and they frequently ask which form is the best. Many add cranberry juice to their diet because of its perceived benefits for the urinary tract. However, little is known about the effect of cranberry juice on urinary stone risk.

SUBJECTS AND METHODS

Six volunteers participated in a study of six drinks, a still mineral water, a carbonated mineral water, cranberry juice, orange juice,

grapefruit juice and a common cola drink. A control urine sample was collected 2 h after consuming 500 mL of a standard mineral water. This was followed by a test drink (1 L, taken over 1 h) and all urine in the following 6 h collected and pooled. Urine samples were analysed for pH, calcium, oxalate, citrate, sodium, potassium, magnesium, phosphate and creatinine. The results were analysed in relation to creatinine level as the difference between control and test urine (paired *t*-tests).

RESULTS

Orange juice, grapefruit juice and carbonated water caused a significant increase in pH ($P < 0.05$) and both calcium and citrate were significantly increased by grapefruit juice ($P < 0.05$). There were no other notable differences which might be expected to influence stone disease.

CONCLUSION

After a large acute load of various soft drinks, none were found to be particularly beneficial or detrimental in terms of excretion of stone risk factors. In particular, the popular use of cranberry juice appears to be neutral for any lithogenic properties and can be a useful means to increased urine output.