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Combined flexible URS and percutaneous 'through and through' puncture of an intra-renal cyst with internalisation of drainage, to treat calyceal obstruction and recurrent stones

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ABSTRACT

A 61 year old gentleman had a large renal cyst, thought to be causing a 'pseudo-hydrocalyx' leading to recurrent stones. Definitive treatment with laparoscopic deroofing was planned, however intra-operatively this was abandoned due to complex anatomy and scared adherent tissue. Patient went on to have a flexible ureteroscopy and 'through and through' puncture of an intrarenal cyst with PCNL to treat his stones and renal cyst simultaneously. CT scan 12 months later showed no new stone formation and no residual cyst. Percutaneous puncture of a renal cyst combined with flexible ureteroscopy is an effective method when treating large renal cysts.

Introduction

Renal cysts and stones are two of the most common lesions found within the kidney. Renal cysts can be congenital or acquired and autopsy studies have shown a 50% incidence of renal cysts in those over 50 years of age.[1] The majority of renal cysts will be found incidentally and patients will be asymptomatic. However, as they enlarge, they may cause pain, haematuria or pelvicalyceal obstruction. The management of such cysts will most often be either with laparoscopic deroofing or aspiration±sclerotherapy.[1] In recent years flexible ureteroscopic holmium laser incision has also been shown to be an effective method for treating simple renal cysts with less blood loss and similar success rates to laparoscopic deroofing.[1] Renal stones are also a common finding, with 9% of people experiencing stone symptoms at some point in their lifetime. The prevalence of which is increasing, thought to be secondary to the rise of obesity, diabetes, hypertension and metabolic syndrome.[2] Migrating stones can cause a significant health burden from renal colic to obstruction and deteriorating renal function. Management of renal stones depends on their size and position. The three most common treatment methods are extracorporeal shockwave lithotripsy, rigid or flexible ureteroscopic (URS) procedures (also termed retrograde intrarenal surgery) and percutaneous nephrolithotomy (PCNL).[2]

Case presentation

We describe a case of a 61 year old gentleman with persistent right sided abdominal pain secondary to a large right renal cyst and recurrent lower pole stones Fig. 1. The cyst was thought to be causing a 'pseudo-hydrocalyx' leading to recurrent lower calyceal stone formation. Furthermore, the direct pressure effect from the cyst itself led to very difficult intrarenal access. Following recurrent stone formation after previous clearance and repeated flexible ureteroscopy (URS) and laser, definitive treatment for his cyst was planned, in the form of laparoscopic deroofing surgery. However, intra-operatively the procedure was abandoned, due to complex renal anatomy, scarred adherent perinephric tissue and multiple crossing vessels. The scarring was probably a result of his previous stone disease and interventions, including percutaneous renal cyst aspirations and flexible ureteroscopies. Given the benign nature of the disease, the management was re-evaluated.

Following stone MDT (Multidisciplinary Team) discussion, the decision was taken to schedule the patient for a flexible URS and percutaneous 'through and through' puncture of an intrarenal cyst with PCNL to treat his stones and renal cyst simultaneously.

His operation entailed an initial percutaneous 'through and through' puncture of the renal cyst with ultrasound guidance and direct internal visualisation with flexible ureteroscope, carried out by our interventional radiologist and urologist, respectively Fig. 2. A guidewire was introduced through the cyst and into the renal pelvis Fig. 2 Flexible

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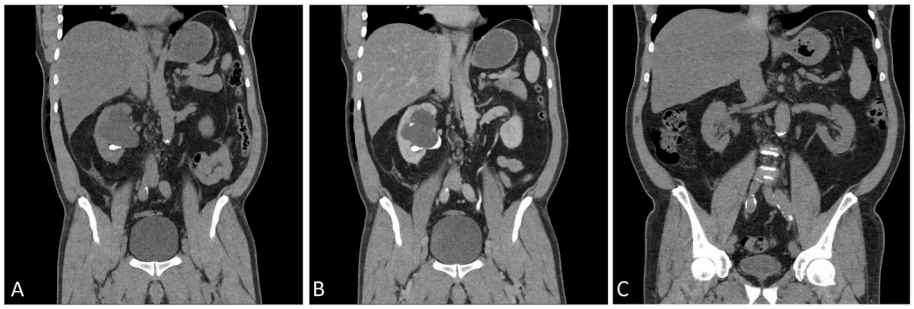

Fig. 1. CT scans
A: Preoperative CT non-contrast showing stones and cyst
B: Preoperative CT urographic phase
C: Postoperative CT 12 months after procedure showing no stones or cyst.

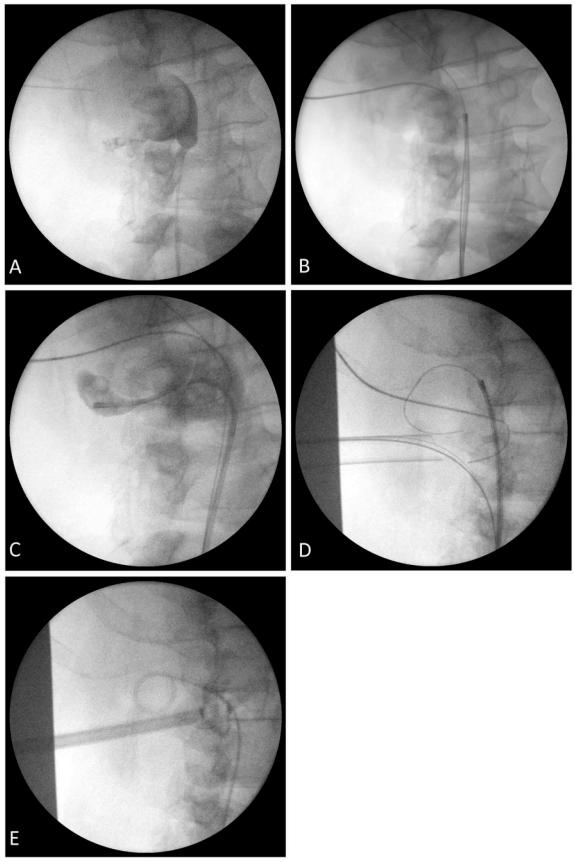

Fig. 2. Intra-operative Image Intensifier Radiographs
A: Percutaneous puncture of cyst and retrograde studies
B: Puncture of cyst with flexible cystoscope in upper ureter
C: Flexible URS in lower pole with stones visualised
D: 'Through and through' puncture of cyst with flexible URS and guidewire placement
E: Stent within cyst.

ureteroscopy was then carried out, through which we used a Holmium laser to create an internal defect, following the guidewire, into the renal cyst. We then placed a J-J ureteric stent, with the proximal end of the stent within the cyst and the distal end within the bladder Fig. 2. This allowed for long term internal drainage of his recurrent right renal cyst. At the same time, he underwent PCNL and clearance of his lower pole renal calculi.

Stone analysis showed 100% uric acid, previous stone analysis had shown a combination of uric acid and calcium oxalate stones. The patient was managed with dietary advice, exercise and weight loss. The stent was removed after 6 weeks and urinary alkalinisation has not been needed. Repeat CT scan 12 months post procedure showed no new stone formation and no residual cyst or hydronephrosis Fig. 1.

Discussion

We have described a method for long term internal drainage of a large renal cyst in a patient with complex stone disease and irregular anatomy. Endoscopic Combined Intrarenal Surgery (ECIRS), combining retrograde ureteroscopy and supine PCNL has been shown to be a safe and effective way to manage complex renal stones. Hamamoto et al. have published a case series looking at large stones (3–4cm) managed with ECIRS and shown significantly higher stone free rates than PCNL (81.7% vs 38.9%).[3] However, there are few documented cases of ECIRS being used to treat a renal cyst and calculi at the same time. Hu et al. have published a case series of 28 patients looking at the simultaneous treatment of renal stones and cysts with PCNL and intrarenal cyst laser incision and drainage.[4] There were some differences between our case and their case series; the majority of the cysts they treated were between 1 and 3.5cm, compared to the cyst in our case which was over 5cm. In addition, the placement of a J-J ureteric stent from the cyst to the bladder, facilitated internalisation of cyst drainage postoperatively and minimised the risk of recurrence. Our case further supports the data published by Hu et al. and demonstrates a safe and effective method of treating complex renal calculi with an ipsilateral large renal cyst thought to be behaving like a 'pseudo hydrocalyx'. The management of a true hydrocalyx is often similar to that of a renal cyst, intervention is only required if pain, infection or stones are present and would consist of percutaneous management, flexible ureteroscopy or laparoscopy.[5] A similar technique to that described in our case could also be used for a true hydrocalyx.

Conclusion

Percutaneous puncture of a renal cyst combined with flexible ureteroscopy is a safe and effective method when treating large renal cysts. It is a procedure with low morbidity and should be considered prior to a formal laparoscopic deroofing procedure for intrarenal or parapelvic cysts. ECIRS is an evolution of conventional PCNL that allows treatment tailored to an individual, higher stone free rates and a reduction in the number procedures a patient must undergo to become stone free. As demonstrated by our case it is particularly advantageous in patients with concurrent symptomatic large renal cysts and calculi, where laparoscopic surgery may be technically difficult due to previous surgery, scarring or those with aberrant or difficult anatomy.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.eucr.2020.101125.

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