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Stones and Endourology

Short communication

Two pelvises, one stone: A different approach for management of calculi in a duplex renal collecting system

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Abstract

Duplex renal collecting systems are a common congenital abnormality. Management of renal calculi in patients with this abnormality is complex. We describe a patient with a duplex collecting system presenting with a renal calculus. Initial flexible ureteroscopy failed to reach the collecting system containing the stone due to inability to visualize an additional ureteric orifice. The patient then underwent percutaneous puncture of the stone containing moiety, followed by antegrade stent insertion. This allowed for guidewire-assisted passage of a ureteroscope into the duplex collecting system, where the calculi were identified and fragmented.

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Introduction

The management of patients with urolithiasis has evolved dramatically since the turn of the century, meaning patients may now be offered multiple treatment options for urinary calculi. These include

endourological treatments as well as percutaneous procedures. The treatment decision must take into account technical considerations as well as patient choice. Congenital renal tract abnormalities may further complicate this decision. With an incidence of 0.8% [1], duplex collecting systems are among the most common congenital renal abnormalities. This abnormality arises during the fourth week of embryological development due to duplication or splitting of the ureteric bud, the precursor to the ureter. The duplex system may be complete, resulting in two collecting systems draining via two independent ureters into the bladder or elsewhere. Alternatively, in partial duplication, the two ureters fuse prior to their entry into

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Figure 1 CT urogram coronal view left duplex system.

the bladder. Though patients with duplex kidneys are more likely to be affected by vesicoureteric reflux and pelvic-ureteric junction obstruction, they often remain asymptomatic, with the abnormality being diagnosed incidentally due to other presentations such as urolithiasis. Flexible ureteroscopy (fURS) and laser fragmentation of calculi is reported to be an effective treatment modality for patients with symptomatic urolithiasis affecting a duplex collecting system [2]. This technique is, however, susceptible to technical and anatomical confounders. We report the management of symptomatic urolithiasis in a duplex renal system where initial fURS failed to locate the calculus.

Case presentation

A 39-year-old male with a history of left urolithiasis treated with percutaneous nephrolithotomy (PCNL) nine years previously, presented with new onset left flank pain and haematuria without signs of sepsis. On clinical examination, he was exquisitely tender at the left renal angle. Blood tests revealed no abnormality of renal function. As the patient was known to have a duplex kidney on the left side, a CT urogram was the first line imaging modality performed. The CT urogram showed an 8×6 mm left renal calculus in the lower pole of a partially duplicated renal system (Figs. 1 and 2), with duplex ureters fusing prior to entry into the bladder. The subsequent management of this patient comprised four stages. Initially, left fURS was undertaken with the intention of performing laser lithotripsy. However, the additional ureteric orifice leading to the lower moiety containing the stone could not be identified. Following local departmental discussion, the patient underwent uneventful elective nephrostomy into the left lower moiety, followed by antegrade

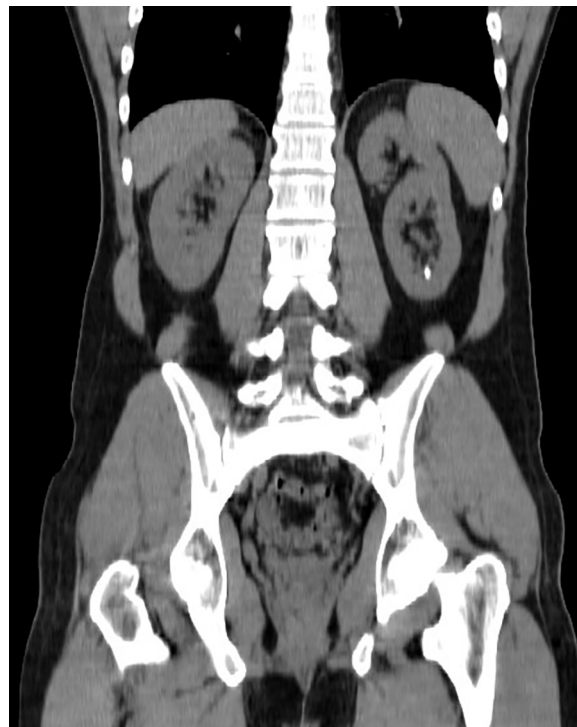


Figure 2 CT (Plain) 8×6 mm left renal calculus in the lower pole.

insertion of JJ stent (Fig. 3), both performed by an interventional radiologist. Two weeks later, a further fURS was performed. During this procedure, a retrograde guidewire was passed via the stent into the left lower moiety. The stent was then removed and a retrograde ureterogram performed which showed contrast ascending to the upper moiety (Fig. 4). Semi-rigid URS was then performed and the additional ureteric orifice was readily identified (Fig. 5). The ureteroscope passed into the left lower moiety where the calculus was identified snared and fragmented using a laser. During the same procedure, the nephrostomy was removed and a retrograde 6Fr JJ stent inserted. The patient recovered well following this procedure and was discharged on the same day without complications. The patient returned one week later and the JJ stent was removed.

Discussion

Non-contrast CT kidney, ureter and bladder (KUB) is considered to be the gold standard imaging modality for calculi. Where a duplex collecting system is affected by renal stones, a CT Intravenous Urogram (IVU) should be performed. This more readily identifies duplex ureters and may visualise the level of ureteric fusion, further aiding endourological management. This also ensures that the operator is not misled by an apparently normal fURS [3], which may have occurred in this case had we not known to seek an additional ureteric orifice. Endourological management of ureteric and renal calculi including shockwave lithotripsy, fURS and PCNL is now well established. However, new methods for applying these technologies in the management of complex renal calculi are emerging. We describe a case where selective puncture of a particular renal moiety with percutaneous nephrostomy and antegrade stent insertion can aid retrograde intrarenal surgery. This technique may prove useful where attempts identify a calculus in a duplex system with fURS alone have failed. This case also highlights the importance



Figure 3 Nephrostomy and stent into the left lower moiety.

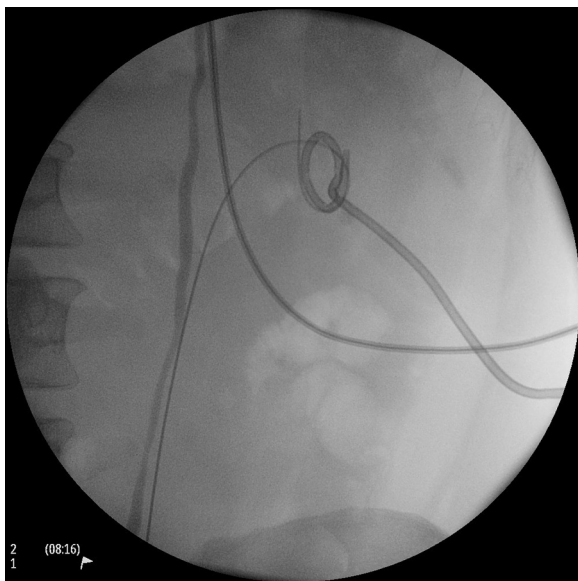


Figure 4 Retrograde ureterogram.

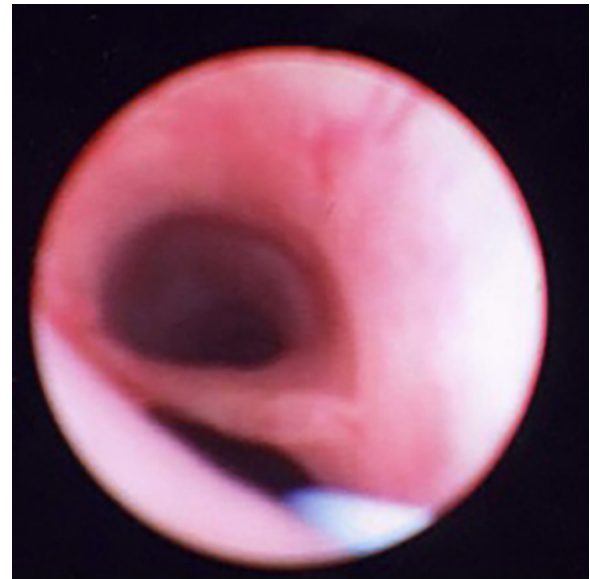


Figure 5 Two ureteric opening visualised during semi rigid ureteroscopy.

of the relationship between urology and interventional radiology in the planning and management of such complex cases.

Informed consent

Verbal informed consent was obtained from the patient.

Authors' Contributions

ME researched literature and conceived the study. MB, MS and HM were involved in writing the first draft of the manuscript. All authors reviewed and edited the manuscript and approved the final version of the manuscript.

Conflict of interests

The Author(s) declare(s) that there is no conflict of interest.

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