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Boari-Flap reconstrution due to a total ureteral avulsion in a patient with ipslateral ureterolithiasis and contralateral renal nodule

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ABSTRACT

The ureteral avulsion during ureterolithotripsy (URS) occurs due to the sudden movement of the optical device or endoscopic extractor either in its removal or insertion, associated with a probable previous lesion in the ureter wall, causing a vital fragility area. A 52-year-old male patient with, an obstructive calculus of 9 mm was found in the left middle ureter, and a heterogeneous hypervascular nodule located in the right kidney, suggesting neoplasia. During procedure with rigid ureteroscopy with ureteroscope removal, due to the pressure of the device and tissue fragility, there was total ureter avulsion.

Introduction

Ureteral lithiasis is a common day-to-day disease of urology services worldwide. Despite the frequency of treatment, the procedure has its classic complications. Two of them have a difficult to handle gravity, besides very low frequencies: perforation and ureteral avulsion. The ureteral avulsion during ureterolithotripsy (URS) occurs due to the sudden movement of the optical device or endoscopic extractor either in its removal or insertion, associated with a probable previous lesion in the ureter wall, causing a vital fragility area.[1] However, in the literature, this event is rare and is dependent on the urologist's experience in performing the procedure but is generally not related to any contralateral renal complication, which may raise further concern during the procedure, impairing the continuity of prior planning of the surgery procedure. This detail of a single functional kidney with ipsilateral ureter avulsion has no favourable reports. The report presents the objective of presenting a fleet management option in situations of complicated ureter avulsion.

Case report

A 52-year-old male patient with medication-controlled hypertension reports left low back pain for two months without irradiation, worsening of movement, or inflammatory signs. Denies haematuria or dysuria. Due to general clinical symptoms, the service requested non-contrast-enhanced computed tomography for initial evaluation. On examination, an obstructive calculus of 9 mm was found in the left middle ureter, without hydronephrosis in the ipsilateral kidney, and a heterogeneous hyper vascular nodule located in the middle third of the right kidney, whose dimensions were 1.8 × 1.7 × 1.6 cm., an image suggesting neoplasia (Fig. 1A and B).

The therapeutic approach was right total nephrectomy, due to the highly suggestive aspect of cancer; however, initially, we decided to place a JJ catheter into the left ureter in order to improve the patient's total renal function, as well as its postoperative prognosis in the patient. During procedure with rigid ureteroscopy for double J stent placement, calculus was observed in left ureter with intense inflammatory process in the ureteral wall, with friable and haemorrhagic appearance. With ureteroscope removal, due to the pressure of the device and tissue fragility, there was total ureter avulsion in the transition of the middle

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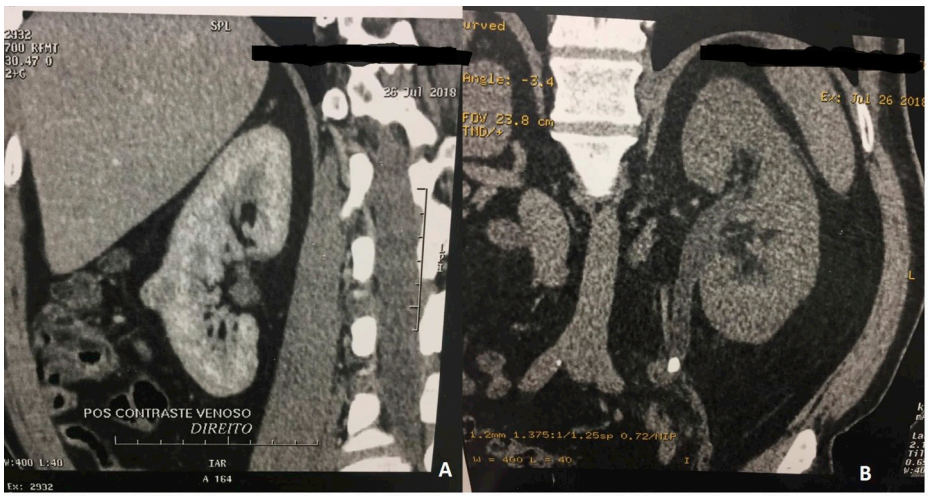

Fig. 1. A. CT scan showing solid nodular lesion in the right kidney (before surgery)
B. Computed tomography identifying calculus in left middle ureter, at L4-L5 height, with left kidney presenting obstructive uropathy components. (before surgery).

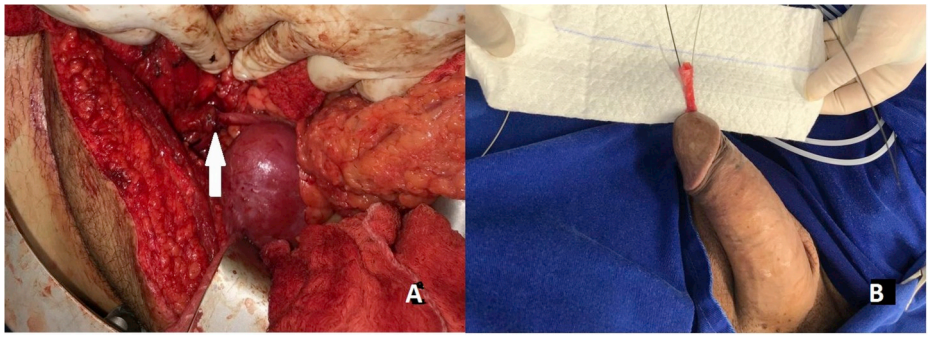

Fig. 2. A. Intraoperative image showing ureterovesical anastomosis
2B. Avulsed ureter during the reconstruction procedure.

and distal ureter. Next, the approach was immediate exploratory laparotomy, with rapid ureteral bladder reconstruction using the Boari-flap technique after excision of the inflamed ureteral portion, since the possibility of primary anastomosis between ureteral stumps was challenging to perform due to local inflammation and lesion location. Subsequently, double catheter implantation was performed in the repaired ureter (Fig. 2A and B). Because the patient had stable pre-surgical conditions and in order to avoid a new long-term surgical approach, a partial right kidney nephrectomy was chosen, with total removal of a nodular lesion that was previously located on tomography. Patient progressed well in the postoperative period without major complaints, being discharged in 5 days. After one month, there was endoscopic left ureteral stone lithotripsy without complications. Histopathological biopsy of the renal lesion revealed clear cell-like renal cell carcinoma, 1.0 cm in the largest diameter, with thin, diffuse margins. CT scan after four months after surgery reduced the inflammatory process in the left ureter, with an area of ureteral replantation in the left superolateral bladder wall, without nodular lesions in both kidneys (Fig. 3).

Discussion

A ureteral avulsion is a rare complication within the endoscopic treatment of urolithiasis. In recent research, this complication had only 0.3 frequency within all cases of ureterolithotripsy, being associated with firm impaction of calculi in the wall and areas of previous ureteral lesion, and the attempt to remove larger stones through the basket. These factors are recurrent in published cases of total ureter avulsion, unlike the case reported by our team. There was no attempt to withdraw the calculation or excessive manipulation of it forcibly.[2] What may be related to avulsion was the intense inflammatory process of the ureter visualized during ureteroscopy. After an unsuccessful attempt to insert a double j stent into the ureter, the stent was removed as well as the rigid optic used, but simple movement at the site caused ureteral avulsion. The presence of inflammatory tissue, either proximal or distal to the stone impaction site generates a potential for rupture of the ureteral wall. Added to this factor, the delicate tensile strength of the region, approximately 457.52–33.74 Ncm-2 and 902.43–122.08 Ncm-2, in a circumferential and longitudinal direction, respectively.[3]

This complication is of high severity within a standard procedure in urological routine, and due to its nature, the conduct to be performed should be immediate and depends on the site of injury. Ureterostomy is indicated in cases of proximal avulsions but has more severe late complications, including total loss of renal function. In the medium or distal ureter, the options increase, and the Boari-Flap technique is widely used, since it decreases the likelihood of a postoperative evolution of the case for ureter stenosis.[4] The use of the endoscopic approach for immediate treatment is not indicated or reported in the literature, but the use of supportive stents to aid surgical healing is not ruled out.[5] Therefore, the laparoscopic or conventional approach was the most favourable options for conducting the case. In association with calculus in the ureter, the decision to perform contralateral partial nephrectomy due to probable neoplasia proved to be of great value, as it used the same surgical time for both procedures. Decisions like this one are challenging to make since not all teams have the experience such as the one reported and can be invaluable to residents as well as the rest of the surgical team involved.

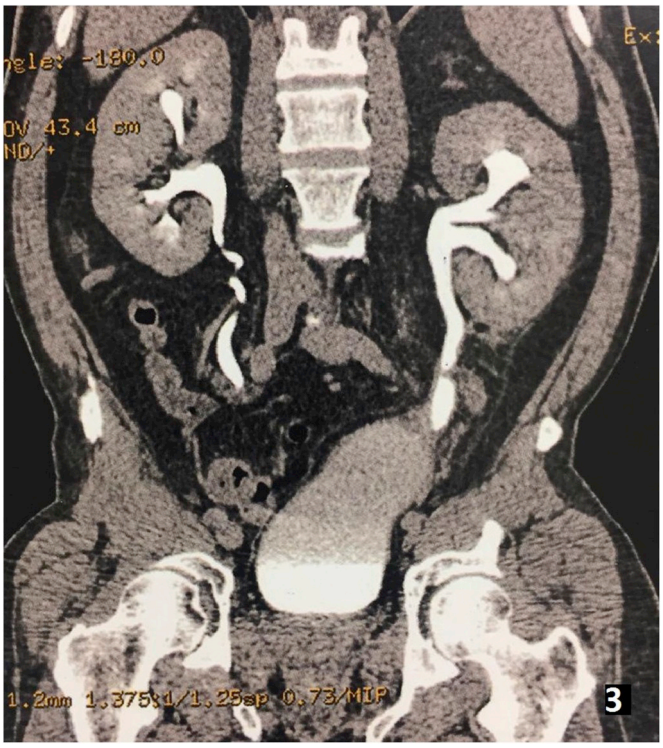

Fig. 3. CT scan showing Boari-Flap anastomosis, with satisfactory contrast elimination.

Conclusions

Although the complication is rare, knowledge and immediate treatment for ureter avulsion are essential, especially when the contralateral side has a suspected lesion or loss of renal function. The experience of handling cases of this nature and high complexity is essential for any urology residency team but needs a prepared preceptor with knowledge in the area of ureteral reconstruction.

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