Missed ureteral injury in a young man with stab injury

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DESCRIPTION

An 18-year-old man was referred to us from the department of emergency surgery for management of his ureteric injury. The patient underwent exploratory laparotomy for bowel injury that he had sustained due to a stab wound to his left flank 1 month ago. At that time his ureteric injury was missed. Two weeks after being discharged he developed fever and his ultrasonogram was suggestive of a large left retroperitoneal collection with mild left hydronephrosis. A contrast-enhanced CT (CECT) scan was done that demonstrated leak of contrast from left ureter into the collection (figure 1A). The patient then underwent insertion of a percutaneous nephrostomy tube into the left kidney along with placement of a drain into the retroperitoneal collection. The drain placed into the collection had purulent output suggesting an infected urinoma. Two weeks later another CECT scan was done, which showed persistent retroperitoneal urinoma, and ureter distal to the injury was not visualised (figures 1B and 2A). We did a combined antegrade and retrograde pyelography that demonstrated complete transection of the left ureter (figure 2B). The drain placed into the collection was blocked so we flushed and slightly manipulated it following which it drained the residual purulent collection. Three months after his initial injury the patient was posted for definitive surgery, and a ureteroureterostomy could be easily performed over a 6F JJ-stent. The JJ-stent was removed after 8 weeks. Four months postsurgery the patient is doing fine.

Ureteral injuries comprise 1% of the spectrum of urological trauma. The ureters are anatomically well protected by the vertebrae, psoas muscle and the bony pelvis hence their injuries are rare. When they do occur they can be missed during initial evaluation and cause significant morbidity.[1] In most of the cases ureteral injuries are associated with penetrating trauma. Often a ureteral injury is associated with bowel or vascular injuries.[2] Haematuria following trauma may indicate ureteral injury but it is not always present. There should be a high index of suspicion to identify ureteric injuries. Investigations that aid in diagnosis include ultrasound, CECT, intraoperative single shot intravenous pyelography and retrograde pyelography. Undiagnosed ureteral injuries lead to formation of urinomas, abscess, fistula and ureteral stricture. The management of ureteral injuries depends on the location. Injuries to the upper third may be

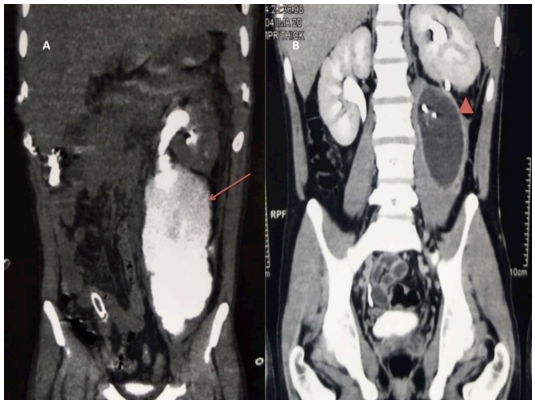

Figure 1 (A) The initial contrast-enhanced CT (CECT) showing contrast leakage into the urinoma cavity (arrow). (B) Subsequent CECT showing residual infected urinoma with drain in the cavity (arrow head).

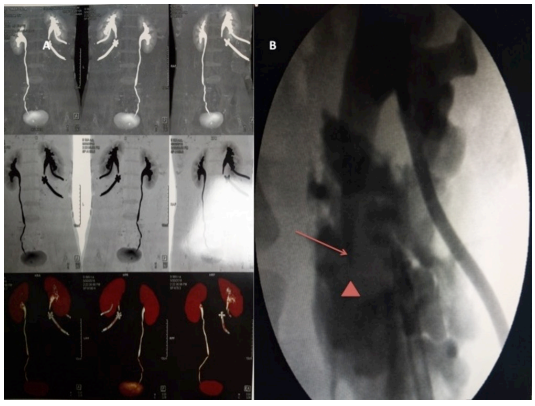

Figure 2 (A) Contrast-enhanced CT (CECT) with three-dimensional reconstruction showing the left ureteral injury with non-visualisation of the distal segment. (B) Combined antegrade and retrograde pyelography showing the proximal (arrow) and distal (arrow head) segments of the transacted ureter with contrast leak.

Learning points

- Ureteral injuries are less common than other urological injuries because the ureters are anatomically well protected by the vertebrae, psoas muscle and bony pelvis.
- A high index of suspicion is required to diagnose ureteral injuries because there are no specific signs and symptoms.
- The imaging modalities useful in diagnosis include ultrasound, contrast-enhanced CT, intraoperative single shot intra venous pyelography and retrograde pyelography, and the management of ureteral injuries depends on the anatomical location in the ureter.

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managed by ureteroureterostomy or ureteropyelostomy, in the middle third by ureteroureterostomy or transureteroureterostomy and in the lower third by ureteroneocystostomy, psoas hitch or a Boari's flap. In cases with partial ureteral injuries, placement of a JJ-stent may suffice. When there is loss of a long segment then substitution with ileal segment is an option. Renal autotransplantation is rarely required. In cases when the patient is not stable or there is contamination with pus the surgery may be delayed by placement of a nephrostomy tube.[3]

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