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Isolated ureteral injury from multiple stab wounds: A case report

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ABSTRACT

This is a case report about a 44-year-old woman who sustained multiple stab wounds, resulting in an isolated right ureteral injury. Despite a precise diagnosis from an urgent CT scan showing contrast material extravasation, the patient's stable vital signs allowed for a thorough surgical exploration, leading to an accurate diagnosis. Immediate surgical repair of the right ureter using an end-to-end anastomosis following precise surgical principles achieved complete restoration of the initial injuries. The case highlights the accuracy of CT scan assessment, the unreliability of hematuria in diagnosing ureteral injuries, and the need for a high index of suspicion during surgical exploration to avoid overlooking such cases.

Introduction

Ureteral trauma is uncommon compared to other urological injuries. It is even rarer when it is consecutive to a stab wounds injury with more severe associated injuries. Prompt surgical exploration and adherence to repair principles are essential for minimizing morbidity and achieving successful outcomes. We present a case of isolated right ureteral injury following multiple stab wounds, which was promptly diagnosed on initial CT scan, and thorough surgical management resulted in favorable functional outcomes for the patient.

Case presentation

A 44-year-old woman with a history of stroke and left facial paralysis came to the emergency department after being stabbed. She was conscious, alert, and showed no signs of unstable vital signs or difficulty breathing. She had multiple stab wounds on her back, right side, left side, left thigh, and right hand. No gross hematuria has been reported.

The wounds were sutured carefully. The hand wound was locally treated with antiseptic and sterile dressing. Intravenous serum, tetanus vaccination, and amoxicillin-clavulanate antibiotic therapy have been provided.

An urgent whole Bodyscan revealed a right proximal lumbar ureteral injury with late-stage extravasation of contrast material without opacification of the distal ureter, suggesting a complete ureteral disruption (Fig. 1). A penetrating wound near the 10th right intercostal space was found, showing a downward trajectory and no signs of hemopneumothorax or organ damage. Multiple penetrating wounds were observed in the abdomen and lower back, with minimal pneumoperitoneum and a small amount of bleeding in the right retroperitoneal space.

Regarding patient's stable vital signs, it was deemed unnecessary to immediately place a scan-guided right nephrostomy tube for

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subsequent repair of the ureter after stabilizing the traumatic injuries. The decision was made to admit the patient directly to the operating room.

The surgery was performed in two stages. In the first stage, a right lumbar incision was made to access the normal right kidney surrounded by urohemothorax. The severed ureter, located 2 cm from the pyeloureteral junction, was carefully prepared and a tension-free end-to-end anastomosis using a fine chromic catgut over a JJ stent was made. Non-aspirating drainage was performed before closing the lumbar wall.

The second stage involved a midline incision, exploring the abdomen with minimal hematoma. The abdominal wall closure was done without drainage.

The postoperative course was favorable, with early mobilization on day 2, lumbar drain removal on day 4, and discharge on day 7. A follow-up after 6 weeks showed healed wounds and intact urinary tract confirmed by an intravenous urogram (IVU) without complications (Fig. 2). The indwelling JJ stent was removed during the same visit, and a subsequent IVU 6 weeks later showed no abnormalities.

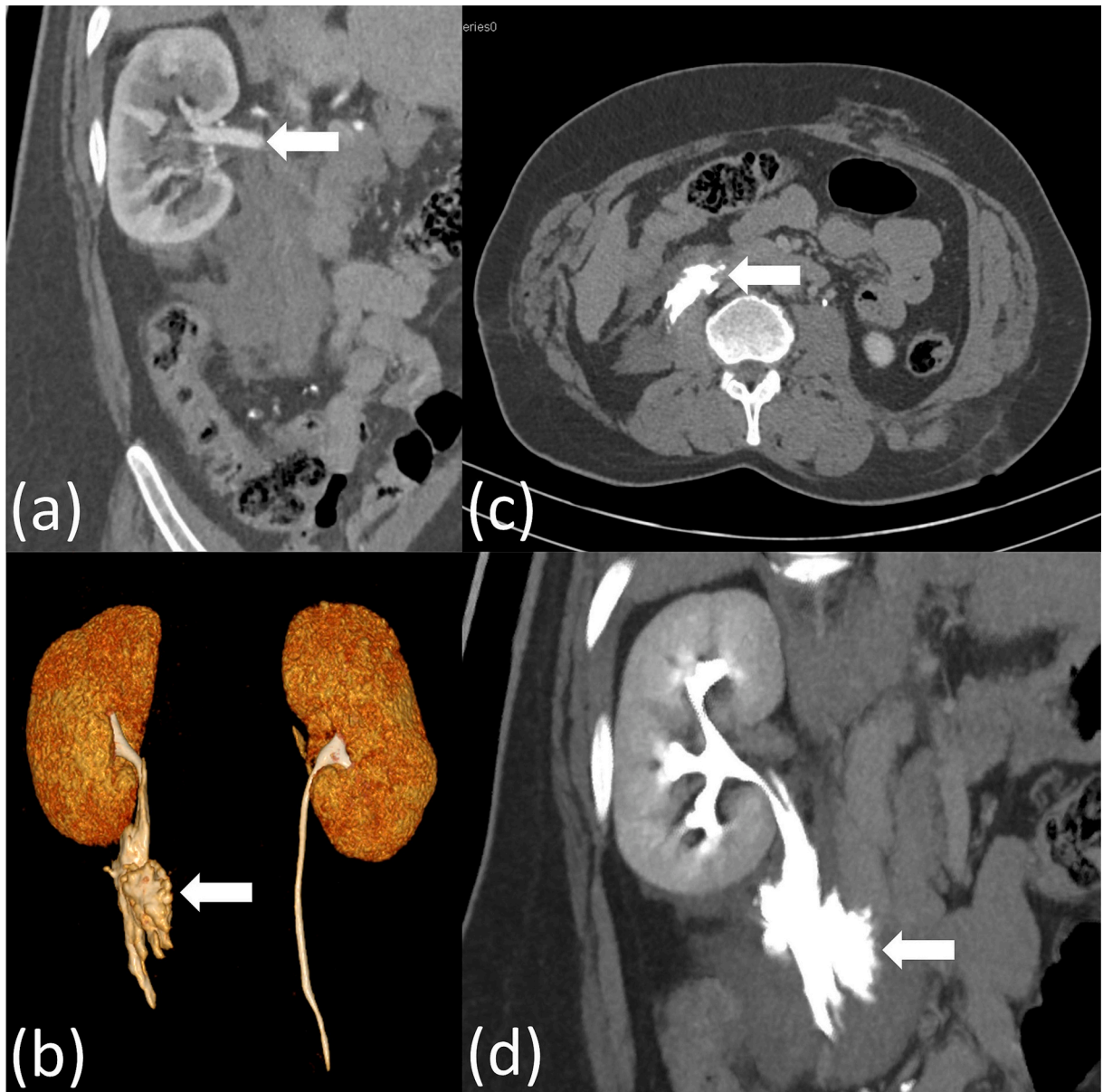


Fig. 1. Computed tomography showcasing a complete disruption of the right proximal lumbar ureter: (a): axial portal image (arrow: discontinuity of the proximal right ureter). (b): 3D reconstruction. With late-stage extravasation of iodinated contrast material (arrow) (c): axial view. (d): coronal view.

Discussion

Ureteral trauma, accounting for only 1–2.5 % of urinary tract trauma, is relatively uncommon compared to other urological injuries [1]. The ureter is well-protected due to its small size, mobility, posterior location, and proximity to musculoskeletal and visceral structures [1]. Consequently, ureteral injuries often occur alongside severe violence affecting multiple organs [2]. Despite multiple stabbing injuries, our patient's isolated right proximal ureter injury was an unexpected finding, potentially overshadowed by the involvement of other organs, resulting in a delayed diagnosis [3]. However, immediate diagnosis and prompt surgical exploration and management play a crucial role in reducing potential morbidity [3].

Penetrating injuries from stab wounds are even rarer, accounting for only 5 % of traumatic ureteral injuries [4]. Furthermore, ureteral injuries often present as asymptomatic, underscoring the importance of maintaining a high index of suspicion during surgical exploration of penetrating abdominal injuries [5–7]. The absence of specific symptoms further highlights the need for vigilance in promptly diagnosing traumatic ureteral injuries. Hematuria, present in only 74 % of cases, proves to be an unreliable clinical finding [8]. Hence, the lack of gross hematuria in our patient upon presentation supports this statement. A review at San Francisco General Hospital revealed 36 patients with ureteral injuries, including 9 cases resulting from stab wounds, with hematuria present in only 75 % of the cases [2].

The study also provided interesting epidemiological insights, showing that, like our patient, the upper ureter was the most commonly injured site, observed in 70 % of the cases [2].

Numerous studies emphasize the need for improved sensitivity and specificity of CT scans, the primary diagnostic tool for pre-operative assessment, in diagnosing ureteral traumatic injuries. Despite efforts, no specific set of initial clinical parameters reliably predicts injuries to the ureter or UPJ, leading to the potential for missed or misdiagnosed injuries [9]. Clinical parameters, such as gross hematuria, abdominal or flank pain, altered sensorium, and transient hypotension, were not present in our patient.

The initial CT scan revealed complete ureteral transection with early contrast extravasation at the sub-pyelocalyceal level, supported by increased extravasation and absence of distal ureteral opacification on the delayed phase. Even without early contrast extravasation, certain CT findings, such as mild perinephric stranding, low density retroperitoneal fluid around the GU tract, and perinephric hematoma, indicate delayed excretory scanning [9].

Urgent exploration in the operating room remains the cornerstone for diagnosing and managing traumatic ureteral injuries [7]. The main objective of repair is to ensure proper renal drainage, with treatment options determined by the injury location, extent of ureteral tissue damage, and associated injuries [5]. The general principles of surgical repair involve a comprehensive evaluation and staging of urological injuries, careful mobilization of the ureter to preserve its adventitia, adequate debridement of nonviable tissue, and the creation of a watertight and tension-free anastomosis using an internal stent [1,2,5]. Adhering to these principles and early management preserved functional prognosis, achieving complete restoration of the initial lesions.

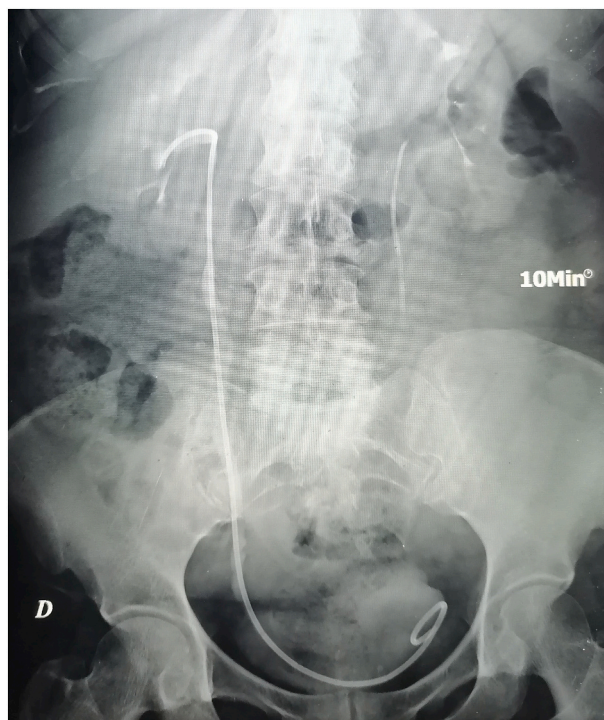


Fig. 2. Intravenous urogram (IVU) performed 6 weeks post-operatively, revealing the integrity of the urinary tract, without contrast extravasation or dilation of the pyelocalyceal system, before the removal of the double J stent.

Conclusion

In conclusion, timely diagnosis and prompt surgical intervention are critical in minimizing morbidity associated with ureteral trauma. The challenge lies in relying solely on specific symptoms such as gross hematuria, which are unreliable indicators of ureteral injuries. To improve detection, enhancing the sensitivity and specificity of CT scans is crucial. Urgent exploration in the operating room remains pivotal for effective diagnosis and management, ensuring proper renal drainage, and reducing potential complications. Adherence to fundamental principles of surgical repair is paramount in achieving successful outcomes.

Signed consent

I have obtained written consent from the patient involved in the case report for the publication of their medical information, ensuring their privacy and confidentiality.

Declaration of competing interest

All the authors declare that there are no conflicts of interest, financial or otherwise, that could potentially influence the content or findings presented in this case report.

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