Missed ureteric injuries

Abdulghafoor S. Abdulkearem, Zaid S. Khudher

Department of Surgery, College of Medicine, University of Mosul

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ABSTRACT
Objective: ureteric injuries may be missed and present as a complication.

Setting: Retrospective study conducted during the period from January 1998 to March 2002 in the urological departments at Al-Jumhoori and Al-Salaam teaching hospitals, Mosul.

Participants: Ten cases of missed ureteric injuries were consulted for or referred to the urological departments, during or after their initial surgical procedures either from the general surgical or gynecological departments.

Results: There were (6) males and (4) females; mean age was (25) years. Eighty percent of cases diagnosed post operatively. They were missed, for variable duration from 24 hours to 2 months. Complications like urinary fistula, loin abcess, fever or loin pain were diagnosed. Two cases were diagnosed and managed intra operatively. The cause of injury was bullets in (50%) of cases, gynecological operations in (30%) and RFA in (20%). Lower parts of the ureter was involved more frequently (60%) specially in pelvic surgery, while the whole ureter was involved by missiles. Both sides were equally implicated. Missed or improperly treated ureteric injury carries high morbidity like hospital stay, re-exploration (70%) and losing renal unit function. Uretero- common iliac artery fistula is a rare but serious complication reported in the cases.

Conclusion: Sound knowledge of pelvic anatomy, preoperative ureteric stenting, isolated uterine artery ligation, keeping the ureteric injury in mind and deliberate ureteric drainage during surgical procedures decrease the chance of missed ones and their sequelae.

الخلاصة

الهدف: إصابات الطحالب تكون عادة مناسبة وتشخيص بعد إجراء العملية الجراحية الأولى نتيجة حدوث الاختلاطات.


المشاركين: العشرة حالات تم الإبلاغ عنها أصلًا أو إثر تأخير في العلاج للأدوية الأولي للإصابة بـ (6) ذكور و (4) إناث; حيث بلغت متوسط عمرهم (25) سنة. وجد أن 80% من الحالات تم التشخيص بـ (24) ساعة وما فوق. (24) حالة خفيفة شديدة تشمل الإصابات الأولى بسبب الاختلاطات كفرط الانزلاق والخميرة البولية أو حذف الأوردة بولية نتيجة التدخل الجراحي. (24) حالة حادة شديدة لحظر الارتجاج الأسبق لانتظام الأذاعات النسبية في البرد ورمーター الطحلب و (60) حالة إجراء العملية الأولي للإصابة. كانت الأذاعات النسبية (50% )، والحمى الشعاعية (30% ) وحذف الأوردة (20% ) في ثلاث سنين للطلقة. كانت (60% ) من الإصابات في عمليات الحفاظ نصيحة للزهاء في الجرح وسعى إضافة الإصابات النسبية في تلبية. أمكننا من الحشي.

الاستنتاجات: إصابات الطحالب المضادة لها معالجة مرتبطة أكثر من المحرك في المستشفى والدعم لعملية جراحية إضافية أو أكثر. (70% ) والحالة ودقة الكفاءة. من الإختلاطات النسبية والحملة التي سبقت، تتوفر بين الحشي والدمار الحربي.
Uterine injuries from external trauma are rare; the uterine mobility, narrow diameter, retroperitoneal location (between the spine and major muscle groups) and overlying peritoneal contents protect it and make it an unlikely target for injury. Furthermore, the presenting signs of uterine injury are often not specific, and diagnostic tests may be relatively non-specific and non-sensitive. Gun shot and blunt trauma account for about 95% of all traumatic uterine injuries. Gun shot and blunt trauma account for about 95% of all traumatic uterine injuries. Gynecological surgery, mainly abdominal hysterectomy, is the main cause of iatrogenic uterine injury (75%). Other causes include colorectal and vascular surgery and various urological endoscopic procedures. Uterine injury may be unrecognized at the time of surgery or at the initial presentation of a patient with multiple injuries. The time of diagnosing uterine injuries is variable, intra-operatively, immediately post-operatively or after different periods of time that could extend up to 7 years. The delayed presentation is principally responsible for the morbidity, such as urinoma, fistula, stricture, sepsis, loss of renal unit and death of the patient due to septicemia or the severity of injury that is associated with a uterine injury. The possibility of uterine injury should be considered not only in the form of laceration or transection but also confusion alone might lead to future extravasation.

Patients and methods

From January 1998 to April 2002, ten cases of uterine injury were dealt with at Al-Salam and Al-Jumhoori Teaching Hospitals in Mosul. All patients were referred from the gynecological, surgical and gynaecological wards after a suspicion of possible uterine injury. Detailed history, physical examination and previous surgical findings at laparotomy were recorded. The time lapse between the first exploration and diagnosing uterine injury was also recorded. Investigations, including urine examination, urine culture, serum urea and creatinine, and complete blood picture were done. All patients were subjected to imaging studies including serial follow up ultrasound examination (US), intravenous pyelography (IVU) and retrograde pyelography. CT scan and MFI were done only for two cases to evaluate a retroperitoneal hematoma or collections and spinal trauma. Those patients with partial uterine injury and successful JJ stent insertion were kept on stent for six to eight weeks. Those who were subjected to re-exploration and reconstruction of the uterus were approached transperitoneally, and JJ stent catheter was inserted in all cases, with retro or intraperitoneal drain. The follow up time was variable from one to five years. It includes evaluation of the general condition, urine examination, US examination and IVU.

Results

Ten cases with uterine injury were included in this retrospective study. There were (6) males and (4) females, their age ranged from 6 to 45 years, with a mean at 25 years. All patients were consulted for or referred from surgical or gynaecological units after initial laparatomy and a suspicion of uterine injury or the development of postoperative complications like urine leak, fever, loin pain and abscess formation. Two cases were diagnosed intraoperatively after deliberate uterine exploration because of a high suspicion of uterine involvement. Eight cases (80%) were diagnosed post-operatively for variable duration from 24 hours to 2 months due to the development of the aforementioned complications. Bullets or shells were the cause of the injury in 5 cases (50%). 3 patients had an iatrogenic injury (30%) and road traffic accidents (20%) accounted for the remaining 2 (20%). Urine leak was present in 7 patients out of 8 in the post operatively diagnosed cases (87%). Abdominal wall abscess in 2 cases and loin pain with fever in one patient. Eighty percent of patients with uterine injury due to bullets had associated bowel perforations and those with RTA had associated pelvic or lumbar spine fractures (fig1).
IVU findings were either contrast leak in 6 patients (75%), persistent nephrogram in one and hydronephrosis in one patient, while retrograde pyelography was diagnostic in all 8 cases (100%), (fig 2&3).

Ureteric stenting using JJ catheter was successful in two patients with partial ureteric injury without the need for exploration (fig 4&5).

The lower third of the ureter was involved more frequently than other parts of the ureter (60 %). Both sides were equally involved. Hospital stay was variable from seven days for uncomplicated cases to six months for complicated ones. Seven patients out of ten were subjected to abdominal re-exploration and two of them to four times (in suspicion of diuodenal fistula). Five patients demonstrated residual hydronephrosis after definitive treatment, two patients were subjected to nephrectomy because of the complicated ureteric injuries (development of ureteric obstruction after JJ stent removal and pyonephrosis). One patient had uretero-common iliac artery fistula and two patients ran uneventful follow up time.

Right uretero-common iliac artery fistula occurred in one of our patients (presented with severe hematuria and shock), diagnosed by angiography and treated in Baghdad; at Ibn Al-Nafees center for cardiovascular surgery; it is a very rare and life threatening complication. The table below summarizes the patients’ events. No mortality was recorded in our cases solely from ureteric injury.

Figures (2) and (3): show right ureteric contrast extravasation in IVU and right retrograde pyelography (complete ureteric transection).
Table 1: Showing the summary of the patients and their course of treatment and complications.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Initial Diagnosis</th>
<th>Treatment</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Arthritis</td>
<td>Medication</td>
<td>None</td>
</tr>
<tr>
<td>B</td>
<td>Arthritis</td>
<td>Medication</td>
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<tr>
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<tr>
<td>D</td>
<td>Arthritis</td>
<td>Medication</td>
<td>None</td>
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</tbody>
</table>

Figure 1: (A and B) Left: Magnetic Resonance Imaging showing the patients with osteoarthritis. Right: Magnetic Resonance Imaging showing the patients with osteoarthritis. (C and D) CT scan showing the patients with osteoarthritis.
Discussion
Ureteric injury is a rare event all over the world, there are only a few series with a sizeable experience, and they are all retrospective[6]. The percentage of missed ureteric injury varies in different centers depending on the experience and the availability of immediate diagnostic investigations, and the missed ones manifest themselves with complications at different postoperative time[6].

Elliot et al. reported 36 cases of ureteric injury in 25 years period, in 1.44% patients (one of the largest published series concerned with ureteric injury in San Francisco general hospital), 86% caused by penetrating injury (72% by gun shot), the upper part of the ureter was involved in 70%, and 3 cases (8%) were missed[6]. In our study it was 2.5 patients/year, 50% of them caused by gun shot, the lower part of the ureter was involved in 60% of cases, and 80% were missed and diagnosed postoperatively. Shittu reported 0.4% incidence of ureteric injury during 20 years period mainly due to gynecological or road traffic accidents, no bullet injury as a cause was reported[6].

Bunchesoungn et al. reported a series of 42 cases of ureteric injury observed over a 20-year period. There were 33 (78%) females and 9 males (21%), mean age 35 years. There were 31 missed cases (73.9%) diagnosed postoperatively after an interval of 3 to 20 days and 2 after an interval of 3 months and the clinical features were dominated by urinary fistula in 33 (78.5%)[6].

Sapkawalsi et al. and Daroraj et al. observed that preoperative ureteric stenting for exact intraoperative ureteric identification is very important before applying clamp cutting or suture/ligature to reduce the risk of ureteric injury[6]. Khaled et al. also concluded that preoperative ureteric catheterization or J stent significantly reduces the incidence of missed ureteric injuries in urological, gynecological and general surgical pelvic operations from 31.7% to 11.8%, and early diagnosis of ureteric injuries is associated with less morbidity[6]. In our surgical or gynecological cases preoperative ureteric stenting is rarely applied preoperatively.

There were 34 ureteric injuries in Yuvraj et al. study during 20 year period, 25 cases discovered intraoperatively and nine cases missed and diagnosed postoperatively after different periods, of time and they concluded that missed ureteric injury causes prolonged morbidity and their management can be difficult[6].

Vani Dandole et al. performed cystoscopy in every gynecological surgery for early detection of ureteric injury but they were unable to discover 2 out of 3 cases of missed ureteric injuries during surgery in ten years period[6].

Yahmaz et al. reported 12 patients with missed ureteric injury following a previous surgical exploration for gun shots; the causes were attributed to intra operative bleeding, shock and blast effect of high velocity missiles[6]. In our cases 50% were due to high velocity missiles which cause more severe and extensive injury and associated retroperitoneal bleeding.

Laps et al. recorded 18 cases of missed ureteric injury during different gynecological procedures, nine of them (50%) diagnosed on table and the other nine cases diagnosed postoperatively after variable period of time[6]. Higher percent of missed ureteric injury was recorded in gynecological cases in our study(8%).

Mohammad et al. reported 18 patients with iatrogenic ureteric injuries during gynecological surgery including two patients with bilateral ureteral ligation and laceration. The delay in diagnosis was 7 years in one patient[6]. The causes were attributed to mass and blind suture or intraperitoneal iliac artery ligation or distorted anatomy of the pelvis and ureter because of adhesions or malignancy. We report a single case of ureteric injury after Caesarean section because of distorted anatomy due to previous three Caesarean sections and the condition diagnosed in the second postoperative day. The incidence of ureteric injury following Caesarean section is exceptionally low (0.69%). Thomas et al. reported 3 cases of ureteric injury following Caesarean section, one of them diagnosed three months postoperatively[6].

Even in orthopedic surgery two cases of missed ureteric injury were reported by Khusteg et al. after hindquarter amputation for malignant bone tumors[6], and Egaewa et al. diagnosed a case of left lower ureteric injury 3 months after left hip joint arthrodesis by the nails[6]. The cause of injury was attributed to lack of pre operative evaluation of the ureter and its course.

Abu-Zidan et al. study supports the presence of urologists within military surgical team because of the missed ureteric injuries diagnosed following the initial surgical procedures done by general surgeons[6].

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Uterine arterial fistulae are very rare. About 61 cases have been described in the available world's literature so far. The condition is a very rare cause of hematuria. The causes were attributed to prosthetic vascular surgery. In our case the tangential vascular injury by bullet and the JJ ureteric stent accounted for its occurrence18.

References