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Case Report

Individualized management of extraperitoneal bladder perforation after transurethral resection of bladder tumor: a report of two distinct cases

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ABSTRACT

Transurethral resection of bladder tumor represents the most common cause of bladder injury. Several factors such as the presence of a tumor itself, the wall thickness, the use of extensive cautery or obturator nerve jerk may lead to bladder perforation. Due to the anatomical site of the bladder, the perforation is extraperitoneal in most of the cases and bladder catheterization alone is sufficient for treatment. In several cases, urine reabsorption can be life-threatening and therefore more active treatment is needed. We present two distinct cases of extraperitoneal bladder perforation which presented with a different clinical image and were treated unexpectedly.

Keywords: Bladder perforation, Extraperitoneal, Bladder tumor resection, Bladder rupture, Bladder injury

INTRODUCTION

Bladder injury represents a common complication in endoscopic bladder surgery. In most cases, transurethral resection of bladder (TURB) tumors is the reason for iatrogenic bladder perforation.[1] Extraperitoneal perforation is more common than the intraperitoneal perforation which occurs in cases of anterior bladder wall injury.[2] Typically, an extraperitoneal injury is managed conservatively with bladder drainage only, whilst intraperitoneal perforation usually requires immediate surgical restoration because it is more severe and dangerous. We present two distinct cases of extraperitoneal bladder perforation after TURB that were managed unexpectedly with different approaches.

CASE REPORT

Case I

A 67-year-old patient was scheduled for TURB for primary high-grade bladder tumor. The patient was a heavy smoker and had a very low BMI (23), but otherwise healthy and fit. Cystoscopy under spinal anesthesia revealed a multifocal papillary lesion covering the trigone, right lateral and anterior bladder wall. During the resection, there was an intense right obturator jerk that created a small bladder perforation at the right lateral wall (Figure 1) and severe bleeding that caused early termination of the operation. A large 22 Ch hematuria catheter was placed in the bladder. Bladder irrigation discontinued one hour later due to the absence of hematuria.

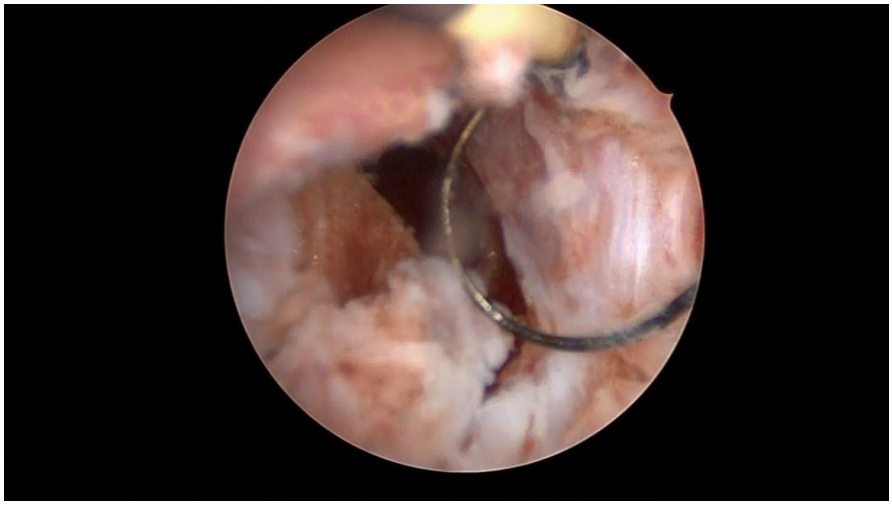

Figure 1: Intraoperative recognition of a small perforation at the right lateral wall of the bladder after intense obturator jerk.

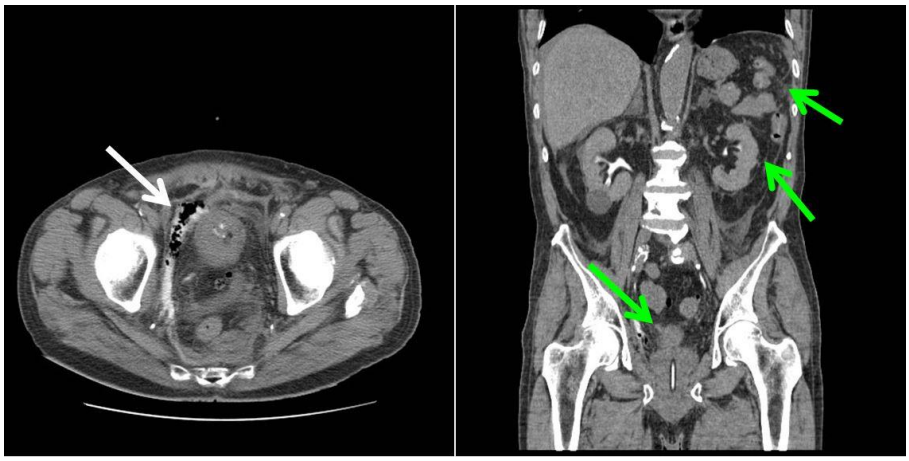

Figure 2: CT pyelography of case one.

The right paravesical space has urine leakage and air bubbles (white arrow). The foley catheter is in place. There is also a small amount of seroma at the retropubic area, perinephric area, and perispleenic area (green arrows).

24 hours later the patient complained of significant pain in the lower abdomen area and oliguria was observed. Despite the catheter replacement and the left decubitus position of the patient, it was not possible to obtain continuous bladder drainage. The patient submitted immediately to a CT pyelography that showed extraperitoneal contrast leakage with air bubbles at the right lower pelvic area and retzius space, and a urinoma spreading up to the left perirenal area (Figure 2). The patient was hemodynamically stable with normal blood tests and afebrile, however, open surgical management was considered appropriate due to the catheter dysfunction and the patient's worsening discomfort. The small right bladder perforation was sutured and drainage was placed in the retropubic space for two days. The patient was discharged at day 5 and the foley catheter was finally removed 10 days later after a plain cystogram that showed no urine leakage. A second CT scan was performed one month later that didn't show any metastatic lesions, lymph nodes or signs of urinoma. Subsequently, the patient underwent a re-TURB under general anesthesia with no complications. The histopathologic examination reported a high-grade T1 tumor associated with CIS. The patient was finally submitted to intravesical BCG treatment and close follow-up.

Case II

A 65-year-old patient presented at the emergency department complaining about abdominal pain and dysuria with hematuria. The patient was in critical condition, with low blood pressure, dehydration, low fever, clinical signs of acute abdomen and disorientation. He had a history of diabetes, high blood pressure, atrial fibrillation and had recently been submitted to TURB for a papillary bladder tumor in another Hospital (12 days before). The patient's wife mentioned that the catheter was removed the first postoperative day with no complications and that the symptoms began 3-4 days

after the TURB. The abdomen ultrasound scan showed an empty bladder and normal kidneys but demonstrated a retroperitoneal seroma. A foley catheter was placed into the bladder for monitoring reasons. Blood examinations indicated severe acute kidney failure (Cr=5.95 mg/dl and urea= 203 mg/dl), hyperkaliemia (K^+=6 mmol/l) without electrocardiographic alterations, as well as elevated inflammatory markers (WBC=25.500/μl and CRP=25 mg/ml). After stabilization of the patient with intravenous fluids and antibiotics, a non-contrast-enhanced CT scan was performed which demonstrated a large extraperitoneal seroma and a potential bladder perforation. The CT cystogram confirmed the diagnosis of extraperitoneal bladder perforation about 1cm located between the bladder dome and the right lateral wall (Figure 3). Despite the patient's severe condition, a conservative approach was decided with the contribution of a Nephrologist. Indeed, several hours later, the patient was impressively improved. Polyuria was managed with IV fluid substitution, and kidney failure and potassium levels were restored 24 hours later without the need for dialysis. The patient was discharged three days later, having normal blood tests and the catheter was removed successfully 2 weeks after the incident. The pathologic report showed an unexpected high-grade Ta urothelial carcinoma without muscle fibers on the specimen that led to the hypothesis of delayed bladder perforation that could explain the patient's clinical presentation.

Figure 3: CT cystography of case two.

200 ml of contrast were inserted into the foley catheter. The small perforation site is seen between the right lateral wall and the dome of the bladder. The perforation is totally extraperitoneal and the urinoma is located at the retzius space (white arrows).

DISCUSSION

Transurethral resection of the bladder is the most common cause of iatrogenic bladder injury. The incidence has been reported up to 58%.[3] Other urological procedures include male slings placements and mesh surgeries for prolapse or incontinence. Gynecologic surgery, especially radical hysterectomy, and abdominal surgery for malignancies can lead to bladder injury in less than 5% of the cases.[4] Regarding the TURB for bladder tumors related iatrogenic injury, factors such as age, tumor size, previous TURB's, and tumor location at the dome increase the risk of bladder perforation.[5] Cystography is the standard of care diagnostic examination in patients with suspected bladder trauma.[6] Plain X-ray or CT cystography with sufficient bladder filling with diluted contrast can be used to evaluate the site of the injury, the severity of the condition and the intra or extraperitoneal perforation. On the contrary, a diagnostic cystography is not necessary in cases of uncomplicated internal bladder perforations at the lateral bladder wall that occur during TURB. In these cases, conservative treatment only with prolonged catheterization is adequate.[7] Unlikewise, complicated cases or intraperitoneal perforations usually require primary surgical intervention.[8] The clinical signs and symptoms after iatrogenic bladder injury often include hematuria, abdominal tenderness or urinary retention and uremia and elevated creatinine levels.[9] The underlying mechanism behind the kidney failure is usually the reabsorption of the urine which can explain the elevated levels of serum urea nitrogen and creatinine. Other etiology may include inflammation of the seroma and sepsis development or bladder outlet obstruction. The phenomenon of reabsorption of the urine is commonly seen in intraperitoneal bladder injuries were urine is rapidly absorbed by the peritoneum and the leakage towards the peritoneal cavity is significant due to the negative pressure. Anuria or retention is observed in these cases. On the other hand, extraperitoneal perforation rarely develops large urine reabsorption and kidney failure. Prolonged indwelling or suprapubic bladder catheterization is the preferred treatment in these cases, where bladder wall restoration usually occurs between 2 and 3 weeks.[10] A second cystography is used to demonstrate the integrity of the bladder before the catheter removal, in general.

In our first case, despite the intraoperative recognition and early termination of the procedure, the relatively

small extraperitoneal perforation could not be managed conservatively. The diagnostic evaluation didn't include a standard cystography because of the severe discomfort of the patient. Furthermore, it was not possible to obtain a continuous flow of the urine through the catheter and as a result, open surgical repair was performed. In the second case, the diagnosis was not recognized immediately. There was a delay of at least 12 days that led to the critical condition of the patient who presented with signs of sepsis, kidney failure and inability to void. The large extraperitoneal perforation was effectively managed with bladder drainage which impressively improved patient's condition without the need for further intervention. In addition, the histopathologic report didn't include any muscle layer. Our hypothesis for the patient was an unrecognized bladder trauma during intensive bladder washings at the end of the procedure or thermal trauma from the monopolar energy that led to delayed perforation.

CONCLUSION

Iatrogenic bladder perforation during transurethral surgery is not an uncommon complication and it is usually located in the extraperitoneal space. Conservative management with continuous bladder irrigation is sufficient in most of the cases, even in those with severe clinical presentation, however surgical intervention and primary closure of the defect may maybe inevitable when other treatments have failed.

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REFERENCES

1. El Hayek OR, Coelho RF, Dall'oglio MF, Murta CB, Ribeiro Filho LA, Nunes RL, et al. Evaluation of the incidence of bladder perforation after transurethral bladder tumor resection in a residency setting. J Endourol. 2009;23:1183-6.
2. Collado A, Chéchile GE, Salvador J, Vicente J. Early complications of endoscopic treatment for superficial bladder tumors. J Urol. 2000;164(5):1529-32.
3. Balbay MD, Cimentepe E, Unsal A, Bayrak O, Koç A, Akbulut Z. The actual incidence of bladder perforation following transurethral bladder surgery. J Urol. 2005;174(6):2260-2.
4. Cordon BH, Fracchia JA, Armenakas NA. Iatrogenic nonendoscopic bladder injuries over 24 years: 127 cases at a single institution. Urology. 2014;84(1):222-6.
5. Golan S, Baniel J, Lask D, Livne PM, Yossepowitch O. Transurethral resection of bladder tumour complicated by perforation requiring open surgical repair- clinical characteristics and oncological outcomes. BJU Int. 2011;107(7):1065-8.
6. Patel BN, Gayer G. Imaging of iatrogenic complications of the urinary tract: kidneys, ureters, and bladder. Radiol Clin North Am. 2014;52(5):1101-16.
7. Traxer O, Pasqui F, Gattegno B, Pearle MS. Technique and complications of transurethral surgery for bladder tumours. BJU Int. 2004;94(4):492-6.
8. Vakili B, Chesson RR, Kyle BL, Shobeiri SA, Echols KT, Gist R, Zheng YT, et al. The incidence of urinary tract injury during hysterectomy: A prospective analysis based on universal cystoscopy. Am J Obstet Gynecol. 2005;192:1599-604.
9. Figler BD, Hoffler CE, Reisman W, Carney KJ, Moore T, Feliciano D, et al. Multi-disciplinary update on pelvic fracture associated bladder and urethral injuries. Injury. 2012;43(8):1242-9.
10. Lumen N, Kuehhas FE, Djakovic N, Kitrey ND, Serafetinidis E, Sharma DM, et al. Review of the current management of lower urinary tract injuries by the EAU Trauma Guidelines Panel. Eur Urol. 2015;67(5):925-9.

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