Trauma and reconstruction

Ballistic trans-urethral resection of the prostate – A case report of gunshot injury to the posterior urethra

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ABSTRACT

We report a case of penetrating gunshot injury to the posterior urethra sustained by a low-velocity projectile during a civilian drive-by shooting. The bullet passed through the prostatic urethra, missing other vital organs and both the internal and external urethral sphincters. Following a period of urethral catheterisation, the patient made a complete recovery with good continence and sexual function.

Introduction

Gunshot injuries to the pelvic area have been reported to damage the posterior urethra but are extremely rare in the civilian setting.1 Such posterior urethral injuries usually carry a very high (up to 80%) risk of associated intra-abdominal organ injuries2 so immediate exploration is usually indicated to repair such injuries, followed by early or deferred management of the urethral injury.3

We report an exceptional case of gunshot injury to the posterior urethra without any other associated organ injuries or long-term sequelae.

Case presentation

The urologist on call was requested to attend the ED to evaluate the case of a 28 year old male patient who was involved in a drive-by shooting with a low velocity firearm.

The patient was conscious and fully alert; he had an entry wound in the right upper thigh and an exit wound in the left buttocks anteriorly. A CT scan of the abdomen and pelvis had been performed by the emergency physicians that had showed only oedema in the tissues around the bladder neck and an undisplaced fracture of the right acetabulum. The patient was noted to have blood oozing per urethra and was unable to void.

A gentle catheterisation with a 16F silicon catheter was attempted successfully and a CT cystogram done through the catheter, showing extravasation of contrast around the bladder base on the right and prostate on the left side (Fig. 1) so a decision was taken to proceed to open surgical exploration in view of the mechanism of injury and likelihood of bladder rupture.

A lower midline laparotomy was performed and a haematoma noted overlying the prostate and paravesically. On doing a cystotomy no entry or exit wounds could be identified, blood was however noted to be oozing up into the bladder from the prostatic urethra. The bladder was closed and the peritoneal cavity was opened and its contents checked for any associated injuries. A urethral catheter was left in situ on free drainage and a suction drain put extraperitoneally over the haematoma. Antibiotic coverage was given parenterally for a few days. The patient made an uneventful recovery and was discharged home with the catheter after a few days. A urethrogram after 6 weeks showed what looked like a contained leak at the level of the prostate (Fig. 2) and on discussion with the uroradiologist it was decided that it would be better to try to directly visualise the area by cystoscopy.

At cystoscopy the external urethral sphincter, distal part of the verumontanum and bladder neck were intact but a TUR-like cavity could be seen in between with scar tissue over the right lateral lobe of the prostate in the presumed bullet track(Fig. 3). A decision was taken to leave the patient without a catheter; the patient managed to void to completion spontaneously and did not develop any complications.

At follow-up three and six months after the injury the patient reported complete continence with no need for safety pads, he also denied any sexual dysfunction whatsoever. US post-void residual showed an empty bladder and uroflowmetry showed a normal curve with an average flow rate of 22ml/sec.

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Penetrating urethral trauma is a rare occurrence, especially in a civilian setting. Posterior urethral trauma is defined as occurring proximal to the perineal membrane at the membranous or prostatic urethra. Most, if not all of these cases tend to be associated with concurrent abdominal organ (specifically colorectal or gastrointestinal) injury, hence the need for urgent open exploration.

Early realignment either by gentle catheterisation or endoscopically are both viable options for management of traumatic urethral injuries – this management is associated with reduced operating time and blood-loss which are both of importance in the management of the trauma patient. It also allows delayed urethral reconstruction, possibly with shorter stricture lengths to deal with, after at least 3 months. However, current EAU guidelines also advise that in cases of severe trauma (penetrating) to the prostate, especially in the case of cavitation and uncontrolled bleeding a bladder neck sparing prostatectomy with immediate reconstruction might be required. In this case bleeding was controlled with the tamponading effect of the urethral catheter and no severe concomitant injuries were noted so a more conservative approach could be taken.

Reported rates of incontinence and sexual (especially erectile) dysfunction after posterior urethral injury vary with different series but tend to be quite significant. De novo erectile dysfunction is reported to be present in up to a third of patients suffering a posterior urethral injury after pelvic fractures in a recent metanalysis. Also about 15% of patients have recurrent urethral strictures after delayed repair for gunshot injuries despite repeat dilatations, requiring further surgery.

In this case our patient had a very satisfactory outcome with urethral realignment by gentle retrograde catheterisation alone, achieving full continence and no reported sexual dysfunction within three months from the incident.

Declaration of competing interest

The authors have no reported conflicts of interest.

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