



Urethro-venous fistula following straddle injury: A case report and image series

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ABSTRACT

We present a case of a 49-year-old man with an acute traumatic urethral injury after a fall onto a fence post. Retrograde contrast study showed a contrast leak and suspicion of a traumatic urethro-venous fistula.

We successfully placed a urethral indwelling catheter (IDC) in the operating room and follow-up urethroscopy showed healing of the injury. The patient remained asymptomatic during further follow-up visits.

1. Introduction

Urethro-venous extravasation has been described following high-pressure retrograde urethrograms and following traumatic catheter attempts, usually both associated with urethral stricture disease.¹

Urethro-spongiosal fistulas have also been reported in this published case. Traumatic catheterization was once again the described mechanism of injury.

Urethro-cavernosus fistula's have been described following straddle injuries, but without vascular involvement to the authors knowledge.²

2. Case presentation

A 49-year-old, medically fit-and-well man presented to the acute urology service after a traumatic urethral injury. The mechanism was a 3-m fall onto a fence post resulting in a straddle injury. He developed instant pain, macroscopic haematuria and difficulty passing urine.

On examination, the abdomen was soft and non-tender. There was blood at the urethral meatus. There was mild tenderness of the testes. The perineum elicited tenderness and ecchymoses extending to the gluteal folds and right medial thigh.

Urine analysis showed red cells of $>1000 \times 10(6)/L$, with no other abnormalities seen. Blood tests showed a normal haemoglobin of 134 g/L, normal creatinine of 88 $\mu\text{mol}/L$, and normal white cell count of $9.94 \times 10^9/L$.

Since there was suspicion of urethral trauma, a retrograde urethrogram was performed (Fig. 1). This showed contrast leak from the

urethra, which opacified the deep pelvic venous system, predominantly on the left.

These finding resulted in the patient being transferred to a tertiary urology centre.

A rigid cystoscopy was performed revealing a mucosal injury in the ventral bulbourethra (Fig. 2). A urethral IDC was successfully placed using a guidewire and intra-operative imaging.

Follow-up urethroscopy at 6 weeks demonstrated resolution of the extra-urethral haematoma, with epithelialization of the mucosal injury (Fig. 3).

The transurethral catheter was removed at the follow-up visit at 3 months post injury. Uroflowmetry demonstrated flow rates Qmax of 13.6 ml/s from a voided volume of 122mls, with a 33ml post void residual. The patient remained asymptomatic but was lost to follow up at the 12 month mark.

3. Discussion

Acute management of blunt anterior urethral injuries and penile shaft injuries involves control of bleeding (haematuria) and ensuring adequate urinary diversion. Suspicion should be raised when history of an appropriate mechanism of injury is taken, often with blood at urethral meatus or inability to void. Retrograde urethrogram is considered gold-standard to confirm the diagnosis.¹

Control of bleeding can be managed with urethral catheterization to tamponade the injury. Profuse bleeding has been reported, and surgical exploration may be required if unable to pass an IDC or if bleeding

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Fig. 1. Retrograde urethrogram, showing contrast extravasation into the pelvic venous system.

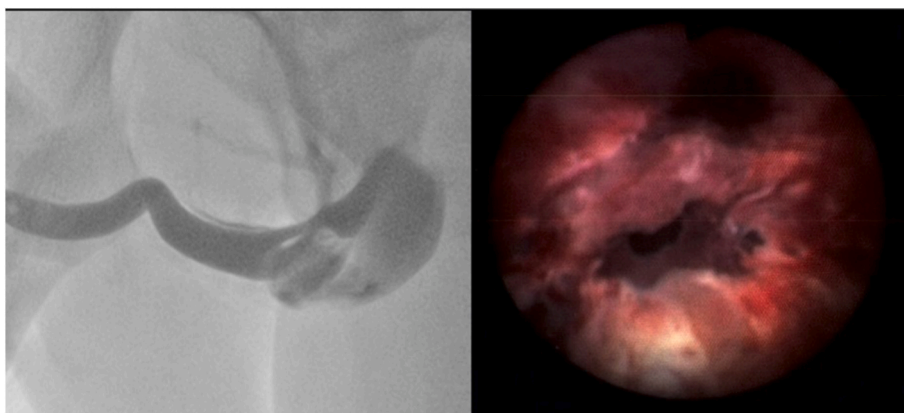


Fig. 2. Lateral view of retrograde urethrogram (left). Cystoscopic view of the urethral injury, with the mucosal breach.



Fig. 3. Follow up cystoscopic view of injury, demonstrating resorption of the haematoma and re-epithelialization of the defect.

persists. Surgical management reported in a case series by *Cavalcanti* et al. describes degloving the penis, draining the haematoma and applying tension-free primary closure of the defect in the urethra, spongiosum and/or cavernosum with 5-0 absorbable sutures over a

urethral catheter. In complete urethral transection, primary end-to-end anastomosis is described.³

To ensure appropriate urinary diversion, a urethral IDC is preferable as this may control the bleeding, and also allow primary realignment with re-epithelialization and healing of the injury without further surgical intervention. The true success rate post traumatic urethra-cavernosal fistulas is currently unknown, with only 12 reported cases in the literature. Healing of anterior urethral injuries with catheterization alone appears to be approximately 57%.⁴ Development of a peri-urethral haematoma and disruption of the urethral passage preventing urethral catheterization is possible, and in this situation a suprapubic catheter is recommended. There is controversy in the literature as to if immediate management with primary repair or endoscopic realignment is superior. Guidelines generally state that a single attempt at urethral catheterization from an experienced clinician is safe but endoscopic placement, as performed in our case, is recommended. Acute complication rates from primary endoscopic realignment have been reported at 0%,⁴ which is lower than that of open primary repair (complications of this include stricture, erectile dysfunction and sepsis).

The main complication of an established leak from the urethra to the vascular circuit is sepsis from gram negative bacteraemia, as well as possible contrast allergy if performing retrograde studies.^{1,2} Pulmonary emboli following retrograde urethrograms has also been described in a case report.

In this case, contrast can be seen to extravasate, then pass to the urethral bulb and into the internal pudendal vein. This then drains into the internal iliac vein before uniting with the common iliac. Some

contrast is also seen in the sacral veins, communicating with the contralateral internal iliac vein.

Traumatic urethral injuries have a high burden of cost and resource on a hospital. These injuries are usually associated with other pelvic trauma; but isolated urethral injuries still occupy theatre space, and require close follow up with uroflowmetry, cystoscopy and elective repair. No guidelines on follow up exist, but 6–12 monthly review with uroflowmetry ± endoscopic reevaluation up to 5 years (provided no complications arise) has been utilized.^{4,5} Lifetime incidence of stricture formation requiring further intervention after primary endoscopic realignment has been reported as up to 100% in some case series, with a mean incidence across all series of 82%. These complications require even more healthcare resource.⁴

Consent

The patient consented to publication of this article.

Declaration of competing interest

None to declare.

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