

Scientific Report

Traumatic urinary diversion caused by gunshot injury in a stallion

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Summary

A seven-year-old stallion with diversion of urinary pass to the thigh due to a urethral fistula caused by gunshot perineal injury was presented to the Urmia University, Veterinary Teaching Hospital. No signs of urinary obstruction or renal failure were observed. Because of inaccessible location of the injured urethra, through a perineal urethrotomy incision, a urinary catheter was effectively advanced to repel the obstruction into the bladder. Retrograde urethral catheterization was adopted for 5 days to assist mucosal healing. Healing was uneventful and no complications were observed during one month postoperative.

Key words: Fistula, Urethra, Gunshot, Stallion

Introduction

The urethra, a muscular tube lined by mucosa, serves as the normal conduit for urine flow to the exterior of the body after birth. The male urethra connects the bladder to the glans penis and consists of pelvic and extrapelvic segments (Sisson and Grossman, 1975).

Disorders of the equine penis and urethra that require surgery are principally limited to conditions involving urolithiasis, soft tissue obstructions, contusions, and lacerations (Trotter *et al.*, 1981). Traumatic injuries to the penis and urethra are the most common of these conditions. In stallions, kicks and self-inflicted trauma associated with fencing or housing commonly results in penile and urethral injury (Robertson, 1984; Gatewood *et al.*, 1989).

This report describes the clinical features and surgical management of a case of traumatic urethral fistula in a stallion, caused by gunshot injury.

Case history

A seven-year-old stallion weighing 450 kg presented to the Urmia University Veterinary Teaching Hospital with a 10-day history of chronic urinary diversion. Ten days before admission, the horse had been wounded in the perineal region with a gun blast. The client complained of abnormal urine voiding through the tract, which had been created by the penetrated bullet.

On physical examination, two small holes on the perineum and the left thigh were found where the latter acted as the opening of a fistula and as a conduit for urine voiding. There was a pronounced soft tissue inflammatory reaction in the perineal region, possibly due to the presence of extravasated urine. Urine leakage was observed from the thigh wound intermittently. The skin surrounding the wound was soiled and inflamed as a result of the chronic contact with urine (Fig. 1). Vital signs were in normal range.

Fig. 1: Bullet exit hole (black arrow) and skin scalding caused by urine (white arrow) are shown

Blood samples were taken for haematological and biochemical analyses. The animal had a neutrophilia ($8500/\mu\text{l}$) with packed cell volume of 28%. Other haematological parameters and total protein were within normal range. The attempt for fistulography of the injured region was not successful. Ultrasonographic examination was not performed due to some technical

problems.

Treatment was initially conducted to control the regional inflammation by intramuscular injections of flunixin meglumine (1.1 mg/kg, Vetafluxin[®], Aburaihan pharmaceutical Co., Tehran, Iran), sodium ampicillin (20 mg/kg, Jaberebne Haiian Co., Tehran, Iran), and gentamicin sulphate (5 mg/kg, Alborzdarou Co., Gazvin, Iran) for 3 consecutive days. Then under inhalation anaesthesia, by retrograding urethral catheterization, the lesion was located within the pelvic urethra. Subsequently, perineal urethrotomy was performed adjacent to the bullet entry port. Following urethral catheterization, a 10-cm longitudinal median skin incision was made in the perineum. The subcutaneous tissues were divided, and a longitudinal incision was extended deep to divide the bulbospongiosus muscle and corpus spongiosum. The urethra was exposed by retraction of these muscles. A longitudinal incision was made along the caudal surface of the urethra, and the mucosa reflected abaxially. By retrograde advancement of the urinary catheter through the perineal urethrotomy incision, any possible obstruction was driven back into the bladder. After several gentle attempts, the urine flow through the catheter was initiated. Then, the urethrotomy incision was closed in three layers and retrograde urinary catheterization was performed through the external urethral orifice and secured with stay sutures for 5

Fig. 2: Retrograde urinary catheterization was performed through the external urethral orifice. The catheter was secured to skin with stay sutures (black arrow)

days (Fig. 2). Care was taken to ensure exact apposition of the urethral mucosa during the closure. The tract created by the penetrated bullet was curetted and irrigated entirely with diluted 1% Betadine® solution and then left to heal by second intention. The stallion received flunixin meglumine (1.1 mg/kg), sodium ampicillin (20 mg/kg), and gentamicin sulphate (5 mg/kg) for 5 days. The stallion's vital signs, general condition, and the status of urine voiding via the catheter were monitored daily. The catheter was removed on the 7th postoperative day and the patient hospitalized for 3 more days to ensure that the urine voids without difficulty. Since no complications were observed and the penetrating wound tract healed to a certain extent, the stallion was discharged. The stallion was reassessed at weekly intervals for the first month after surgery. On each visit, no further abnormality or difficulty in urination was detected. The tract healed uneventfully.

Discussion

Since the created fistula was in a location that urine could void with slight resistance from the bladder, the stallion had no clinical signs of urinary obstruction or renal failure. The results of the paraclinical examinations (i.e., normal creatinine) confirmed these findings. Nevertheless, the unusual status of the urine passage, and the client's complaints accordingly, was the main reason for surgical intervention in this stallion.

Physical damage to the urethra can take several forms. Penetrating or blunt trauma to the penis can result in urethral lacerations or rupture (Voss and Pickett, 1975). Indirect damage to the urethra may cause focal cicatrization. Iatrogenic urethral injury occurs as a result of incorrect or repeated urethral catheterization or improper endoscopic intervention, causing diffuse urethritis or isolated areas of mucosal trauma (Voss and Pickett, 1975). Urethral

laceration is observed periodically in horses following kicks or fall involving a direct trauma to the perineum or inguinal region (Auer, 1992).

Although retrograde catheterization is a diagnostic approach for assessing the urethral patency and locating the lodged urethral calculi (Walker and Vaughan, 1980), but in the present case it was used as a therapeutic tool. Since the therapeutic measures depend on the form of urethral injury (Walker and Vaughan, 1980), due to unapproachable fistula in this case, a non-invasive surgical approach was elected to the deeply-situated injured pelvic urethra. Although controversial, crushing injuries of the urethra may be treated by placing a sterile urinary catheter for 5 to 7 days (Auer, 1992). On the other hand, the urethral urothelium has a relatively high potential for regeneration (Auer, 1992), which may account for the promising therapeutic results in this horse.

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