

SURGICAL MANAGEMENT OF TRAUMATIC PENILE NECROSIS AND URETHRAL RUPTURE BY PENILE AMPUTATION AND POST-SCROTAL URETHROSTOMY IN BOVINES

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SUMMARY

An eight-year-old draft cum breeding bull and a six year old bullock were brought to clinics with a history of anuria followed by swelling in ventral abdominal and dribbling from the prepuce. Both cases were off feed and water for last 3-4 days. Bull had previous history of mounting a cow 15 days back followed by haematuria, whereas bullock had the history of castration by Burdizzo Castrator 7 months ago and abscess formation in front of the scrotum 2 months after castration. Per-rectal examination revealed partially distended urinary bladder in both cases. The cases were tentatively diagnosed as urethral rupture. Post-scrotal incision in the bull and pre and post scrotal incisions in the bullock revealed adhesions and necrosis of penis in scrotal region. As no calculi or concretions were retrieved, the rupture was attributed to the penile trauma due to faulty intromission and faulty castration. Post-scrotal penile amputation and urethrostomy resulted in saving both the animals. Haemorrhage at the time of urination for few days following urethrostomy and wound dehiscence/open wound healing were minor post-operative complications in both cases.

Keywords: Penile amputation, Penile necrosis, Post-scrotal urethrostomy, Ruminants, Urethral rupture

Urethrostomy, also called urethral fistulation, with penile amputation is the treatment of choice for urethral rupture and/or necrosis where repair of urethra is not possible (Walker and Hull, 1984) or where recurrence of urethral obstruction due to urolithiasis is very high (Haven *et al.*, 1993). Urethrostomy helps in elimination of the most commonly affected segment of urethral tract, and thus prevents recurrence. In feedlot animals, this technique is used as a salvage procedure to utilize the meat; however, this procedure can also be used as a permanent treatment in working and other animals (Larson, 1996). The present report describes surgical management of penile necrosis and urethral rupture, by penile amputation and post-scrotal urethrostomy, in a bull and a bullock. The cause of urethral rupture, however, was not commonly reported urolithiasis but due to penile trauma from faulty intromission and faulty castration. The report highlights the importance of considering an uncommon previous penile trauma in the differential diagnosis of urethral rupture in male cattle.

Case 1: An eight-year-old draft cum breeding bull was brought to clinic with the history of mounting a cow 15 days ago followed by haematuria. One week after mounting, the animal developed anuria and started developing ventral swelling over the penile region and prepuce 3 days after anuria. At presentation, urine was dribbling from the prepuce, animal had ventral abdominal swelling over the penile region, was off feed and water from past 3-4 days (Fig. 1). The bull was treated by a local veterinarian with anti-inflammatory/analgesic and antibiotics for few days without any improvement in the condition. The swelling over the penile region and prepuce

was edematous. The bull was dull, depressed, and dehydrated having sunken eyes. Per rectal examination revealed partially distended urinary bladder.

Case 2: A six-year-old bullock was brought to clinic with the history of anuria since a week, swelling on ventral abdominal and penile region and off feed and water for last 3-4 days. The swelling was more extensive as compared to case 1, but dribbling of urine from prepuce was less (Fig. 2). The bullock had the previous history of castration 7 months back by Burdizzo castrator followed by progressive swelling in front of scrotum and dysuria 2 months following castration. Swelling was diagnosed as an abscess by a local vet and treated accordingly by draining the abscess resulting in improvement. Clinical findings in the case were similar to case 1, except that ventral abdominal swelling was more, extending from scrotum to the umbilicus but preputial opening was not swollen. Animal was dull, depressed and dehydrated with sunken eye balls. Per rectal examination of the bullock revealed partially distended urinary bladder.

On the basis of history and clinical examination, both the cases were diagnosed as urethral rupture due to obstructive urolithiasis or as a consequence of penile trauma. Urolithiasis was ruled out during surgery because of lack of any calculi or concretions near the ruptured urethra and the surrounding tissues. Urine sediment after surgery also did not reveal crystals of clinical significance.

Both the cases were sedated with intramuscular injection of xylazine hydrochloride (Xylaxin; Indian Immunological Ltd., Hyderabad, India) @ 0.05 mg/kg b.wt. and restrained in right lateral recumbency with left

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hind limb pulled cranially and tied with the both forelimbs. 2% lignocaine hydrochloride (Lox 2%; Neon Laboratories Ltd., Mumbai, India) was injected subcutaneously at the site of incision i.e., at post-scrotal region in the bull (case 1) and both at pre and post-scrotal region in the bullock (case 2). The surgical sites were prepared for aseptic surgery. Broad spectrum antibiotic enrofloxacin (Quintas, Intas Pharmaceuticals Ltd., Gujarat, India) and NSAID meloxicam (Melonex, Intas Pharmaceuticals Ltd., Gujarat, India) 20 milliliter each were administered intramuscularly pre-operatively and 5 liter normal saline and 5 liter dextrose normal saline were also administered intravenously prior to surgery.

In case 1, about 10-12 inch long post-scrotal midline incision was made. Penis was exteriorized after subcutaneous incision and blunt dissection. Examination of exteriorized penis revealed ruptured urethra at the level of distal bend of sigmoid flexure along with fibrous adhesions around the rupture site. Further exteriorization of penis revealed necrosed urethra and penis distal to rupture site (Fig. 3). No calculi were retrieved from rupture site and there was no evidence of calculi on either side of the ruptured urethra. Dorsal penile blood vessels were ligated proximal to ruptured urethra and proximal bend of sigmoid flexure and penis was transacted distal to the ligature. A straight artery forceps was inserted in urethral lumen from transacted site and urethra was incised ventrally longitudinally up to two cm to make a V-flap. Ryle's feeding tube no. 14 (Romolene®; Romsons Scientific and Surgical Industries Pvt. Ltd., Agra, India) was passed into the urethra up to ischial arch. Each arm of urethral V-flap was sutured to the skin on either side using 2-0 nylon in simple continuous pattern to make a permanent urethral opening i.e. stoma. Remaining skin incision was sutured by nylon no. 1 in horizontal mattress pattern. An elliptical skin strip (6-7 cm long) on left side about 4-5 cm lateral and parallel to urethrostomy site was removed and skin edges were sutured together to relax the stoma for better urine flow (Fig. 4).

In case 2, about 10-inch-long pre-scrotal incision was made and necrosed subcutaneous tissue was separated and excised. Penis was exteriorized from the incision and examined for any urethral rupture. Penis was partly necrosed but there was no sign of urethral rupture in pre-scrotal region (Fig. 6). Catheter from glans penis was passed up to pre-scrotal region with a bit of resistance. A second incision was made in post-scrotal region; there were adhesions between the penis and the tissues at the site of castration i.e., at the distal bend of sigmoid flexure and necrosis of urethra. The penis was transacted from the

healthy area proximal to the proximal bend of sigmoid flexure after ligating dorsal penile blood vessels and distal penis was removed completely from the post-scrotal region. The remaining urethrostomy procedure was done similar to case 1 (Fig. 7). The pre scrotal skin incision was sutured partially leaving about 3 inch opening to facilitate drainage and removal of necrotic tissue. Several small stab incisions were also made over the swelling on ventral abdominal and penile area with B P blade no. 24 (Fig. 6).

Post-operatively, enrofloxacin and meloxicam were continued for 7 and 5 days, respectively, in both the cases. About 2.5 liter normal saline (NS) solution and 2.5 liter dextrose normal saline (DNS) were administered in both cases for 2 days. All wounds were dressed with 5% povidone-iodine daily; and fly repellent ointment (Himax, Indian Herbs Pvt. Ltd., Saharanpur, India) was applied around wounds till the complete healing.

In case 1 (bull), urine flow started 6 hours after surgery and feed and water intake resumed from the next day. Ventral abdominal swelling reduced markedly by the third day. Wound dehiscence occurred on 10th post-operative day (Fig. 5); however, catheter was retained securely at its position with normal urine flow. The wound dehiscence was treated by removal of sutures and routine dressing; complete healing was noticed at 3 weeks, the bull urinating normally from the urethrostomy site and doing routine work. In case 2 (bullock), urine started coming through catheter immediately when animal stood up from recumbency (Fig. 8). Bleeding was noticed at the time of urination for initial 4-5 days. Animal resumed taking feed and water from 3rd day post-surgery. Sutures were removed after 14 days and pre-scrotal open wound healed in four weeks.

Urethrostomy is a surgical procedure indicated in cases of ruptured urethra and necrosis of penis either due to urethral calculi or any other reason like irreparable injury to penis and penile urethra and recurrent urethral obstruction (Haven *et al.*, 1993; Larson, 1996; Van Metre, 2004). In both the cases, urethrostomy was done because trauma to the penis had resulted severe necrosis of the penis and urethra. In authors' opinion, calculi were not the cause of urinary obstruction or urethral rupture in both cases. In case 2, it was done because of urine leakage secondary to abscess induced adhesions and necrosis of penis and urethra. The bull had the history of mounting a cow followed by haematuria for few days before development of the urethral rupture. Rao *et al.* (2003) have also reported a case of penile injury with urethral rupture during coitus in a bull. Since no calculi or calculus were retrieved at the time of surgery, it was speculated that

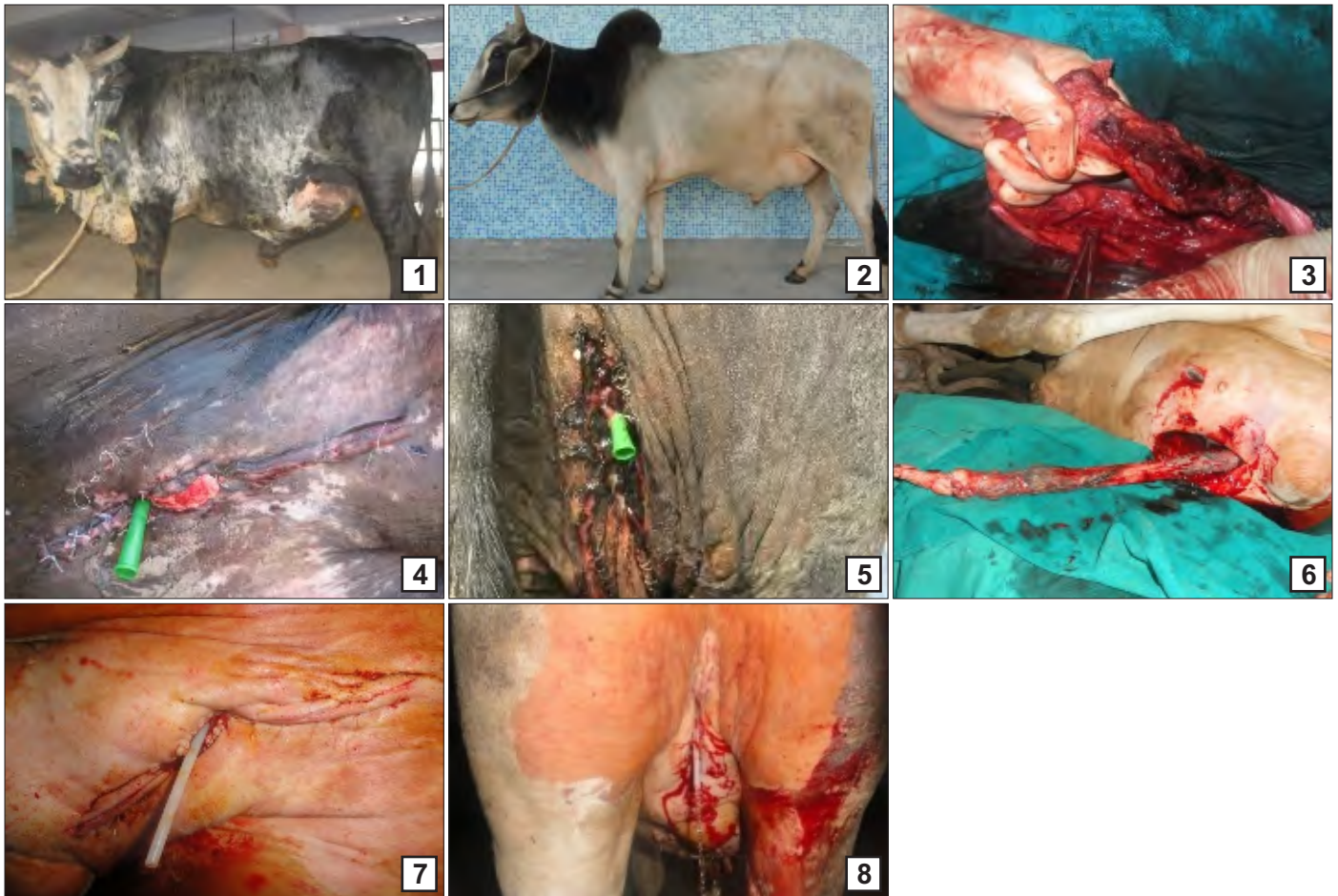


Fig. 1 to 8. (1) Bull: An adult bull with the history of retention of urine showing ventral abdominal swelling over penis and prepuce; (2) Bullock: A six-year-old bullock with the history of anuria for 4-5 days showing extensive ventral abdominal swelling from scrotum to umbilicus; (3) Bull: Exteriorized penis from post-scrotal incision in bull, showing necrosis of penis and urethra distal to sigmoid flexure. No calculi were retrieved; (4) Bull: Post-operative photograph of post-scrotal urethrostomy. Note: Catheterized stoma by Ryle's feeding tube and sutured skin after removal of an elliptical skin strip parallel to left side of stoma; (5) Bull: Urethrostomy site on 10th post-operative day showing wound dehiscence; (6) Bullock: Exteriorization of penis from pre-scrotal incision in bullock. Note partial necrosis of penis indicated by blacked tissue on penis. Several stab incisions for drainage of subcutaneously accumulated urine; (7) Bullock: After completion of post-scrotal urethrostomy and indwelling PVC catheterization of urethra from stoma; (8) Bullock: Urine flow in jet stream from the catheter immediately after standing up from recumbency.

probably the penis was bent due to improper intromission resulting in trauma to the penis and urethra causing haematuria initially and leakage of urine later on. Leakage of urine resulted in swelling in ventral abdominal region as it happens with ruptured urethra due to obstructive urethroliths. Moreover, due to inflammatory response, there was fibrosis at the site of penile injury resulting in adhesions with the tissues around. Subcutaneous accumulation of urine did not allow healing, instead it caused urine scalds and necrosis of urethra and penis (Larson, 1996). Penile amputation was done because it was non-viable and to prevent it to act as a source of infection. The other benefit of penile amputation in such cases is to prevent undue force on anchored urethra and penis in post-scrotal region. Bulls have muscular thighs that may cause narrowing of stoma. To prevent this, an elliptical strip of skin on left side 4-5 cm lateral and parallel to urethrostomy site was removed and edges sutured together for easy flow of urine from the stoma. Van Metre

(2004) has performed this procedure to prevent narrowing of urethrostomy site in a wether goat. Several stab incisions over the swollen area were made in order to drain the urine accumulated subcutaneously (Monaghan and Boy, 1990; Rao *et al.*, 2003; Van Metre, 2004). This was the reason why swelling subsided very quickly. However, in severely swollen and necrosed tissue, it is very difficult to drain all urine and thus cellulitis and abscess formation are most common complications (Van Metre and Fubini, 2006).

The case 2, bullock had the history of castration followed by abscess formation just in front of scrotum with dysuria which might be due to accidental partial crushing of the distal bend of sigmoid flexure of penis along with spermatic cords, a possible complication that should be avoided during castration with Burdizzo castrator (Venugopalan, 1986; Gupta and Khar, 1993). Tissue damage might have resulted in abscess formation that might have caused pressure over the urethra causing

urethral narrowing and sign of dysuria. Urine flow became normal after treatment of abscess but after 5-6 months, the bullock developed signs of urethral rupture. This might be due to fibrosis and adhesions of the penis and the surrounding tissues due to abscessation that could have led to rupture of urethra and subsequently leakage of urine subcutaneously simulating urethral obstruction. The reason for making an incision in pre-scrotal incision was history of previously treated abscess at the site and suspected necrosis of penis. Although, there was not much difficulty in retrograde catheterization of urethra but it could be passed only up to prescrotal region and viability of penile tissues and urethra was also under question. As this was the second time, the bullock had problem in urine flow since castration, urethrostomy in post-scrotal area with penile amputation was performed to prevent recurrence of urinary obstruction (Haven *et al.*, 1993).

From the present case study, it is concluded that any kind of injury to penis of ruminants may lead urethral rupture several days or months after traumatic episode and may simulate a case of obstructive urolithiasis. In cases of necrosis of penis and urethra, post-scrotal urethrostomy after penile amputation is the surgical treatment of choice to save the life of patient.

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