Scientific Report

Congenital penile urethral aplasia in a 4-day-old bull calf

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Summary

A 4-day-old Holstein bull calf with considerable oedema of the belly (water belly) was referred to the Veterinary Teaching Hospital of the School of Veterinary Medicine, Shiraz University. The owner did not observe any urination since birth. Rupture of the urethra was suspected. Perineal urethrotomy was performed. Subsequently, catheterization of urethra revealed the obstruction near the external urethral orifice. Urethrotomy showed a three cm long rupture of urethra proximal to the penile orifice. Surgical exploration showed the penile urethral aplasia which confirmed by histopathological findings. Permanent perineal urethrostomy was the surgical treatment of choice. Fluid and antibiotic therapy were administrated postoperatively. Postoperative follow-up showed a healthy calf without any signs of water belly.

Key words: Calf, Urethral aplasia, Water belly, Urethral rupture

Introduction

Urethral occlusion is usually caused by calculi, but it may also be the results of debris originating in the bladder or kidneys. Urethral occlusion may be accompanied by rupture of the urethra or bladder. When the urethra ruptures, urine collects in the sheath and subcutaneous tissues of the ventral body wall and it becomes progressively larger with time (Gasthuys *et al*., 1996). The male urethra connects the bladder to the glans of penis and consists of pelvic and extra pelvic parts (Sisson and Grossman, 1975). Congenital or hereditary urethral anomalies include urethral agenesis, imperforate urethra, urethral duplication, urethral diverticula, urethrorectal fistula, and urethral stenosis (Wolfe, 1986; Weaver *et al*., 1992). Urethral agenesis is rare and is reported only in human (Kuga *et al*., 1998). There was no report about urethral aplasia in domestic animals. Therefore, this report describes an unusual penile urethral aplasia in a 4-day-old bull calf.

Case history

A 4-day-old bull calf weighing 35 kg with considerable oedema of the belly and penile prepuce (water belly) referred to the Veterinary Teaching Hospital of the School of Veterinary Medicine, Shiraz University. The calf did not have any urination since birth. In clinical examination heart rate, respiratory rate and rectal temperature were 109/min, 30/min and 39.9°C, respectively. Mucosal membrane colour, capillary refill time (CRT), appetite and hydration status were normal. Palpation of ventral body wall showed a painful swelling. Penile orifice was not observed, therefore, retrograde urinary catheterization was impossible. Aspiration from oedematous part revealed a serous fluid with urine odour. Rupture of penile urethra was suspected. The calf was

restrained on his back and epidural anaesthesia was induced by injection of 4 ml of lidocaine 2% in the 1st and 2nd inter-coccygeal vertebral spaces. The area was prepared for an aseptic surgery and perineal urethrotomy was performed by incising the escutcheon caudal to the scrotum. The penis and the urethra were located and an incision was made through the urethra. A catheter with appropriate size was gently inserted into the urethra distally toward the external urethral orifice. Advancement of the catheter was impossible distally.

The penis was pulled out from the incision and urethrectomy was performed leaving 5 cm of the urethra out of the incision. All the bleeders were stopped by transligation using 2/0 chromic catgut. The urethral wall was incised about 3 cm proximally and its edges were sutured to the skin on either sides of incision. The rest of the incision was sutured by Silk No. 1 in simple interrupted suture pattern to leave the incised urethra and penis fixed out of the skin. A three cm long rupture of urethra was observed near the tip of the penis (Fig. 1). The ruptured edges were not sharp, purple in colour but thick, round and granulomatous showing that the rupture was an old one. Movement of the catheter through this urethral rupture toward external urethral orifice was impossible proving urethral tip aplasia.

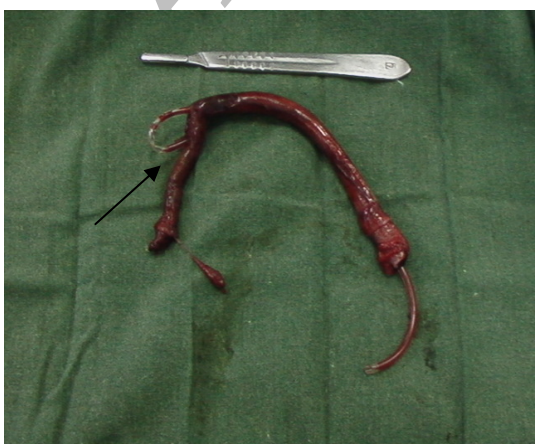

Fig. 1: Urethral rupture due to aplasia of penile urethral tip (black arrow)

The extensive oedematous belly was punctured in several points by stab incision to let the collected urine to leak out gradually.

Histopathological study

Histopathological evaluation showed haemorrhage, early acute inflammatory reaction, granulation tissue and some transitional cells in the ruptured site and confirmed the diagnosis of agenesis in surgical exploration.

Postoperative treatment and care

Intravenous fluid flow was maintained until the calf was ambulatory. Antibiotic therapy was initiated with trimethoprim-sulpha (Trisul, Damloran Ph. Co, Borujerd, Iran), 20 mg/kg every 12 h for 7 days. Three month follow-up showed that the calf was in healthy condition without any problem in urination and signs of water belly.

Discussion

Abnormalities of reproductive system are more common in small ruminants than in large ruminants, and more frequent in goats than in sheep (Rousseaux and Ribble, 1988). In calves congenital abnormalities of the urethra include megalourethra, hypospadia, dilatation, epispadia, congenital urethral imperforation, and deformities of the urethra externa (Hunt and D Allen, 1989; Weaver *et al*., 1992; Geccelep and Alkan, 2000; Radostits *et al*., 2007). Congenital urethral dilatation was reported in a goat (Karras *et al*., 1992) and in a 4-month-old Charolais-cross bred bull calf (Anderson *et al*., 1993). Another congenital megalourethra was reported in a male Charolais calf, but its etiology could not be determined (Weaver *et al*., 1992). Urethral agenesis is sporadic and is found in about 1 in 3000 male man fetuses (Kuga *et al*., 1998). In this report, congenital obstruction at distal part of urethra due to aplasia of the terminal part of urethra in the presence of functional kidney had increased bladder pressure and intra-luminal pressure which resulted in urethral dilatation and rupture of urethra proximal to the obstruction point. Presence of transitional cells in ruptured site is evidence of pressing trauma against the urethral wall. Distal penile urethral agenesis and stenosis could have been the cause of increased urethral and bladder pressure and rupture of the urethra at birth time or shortly after birth.

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