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Successful surgical correction of Atresia ani and urethral diverticulum in a male pseudohermaphrodite crossbred calf

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Abstract

A day old calf was presented with the history of dysuria, stranguria and absence of anal opening since its birth along with the presence of underdeveloped male genitalia and female rudimentary teats. Based on the history, clinical examination and ultrasonogram, the case was diagnosed as congenital atresia ani and urethral diverticulum in a male pseudohermaphrodite crossbred calf. Anoplasty and perineal urethrostomy were performed separately under caudal epidural analgesia using lignocaine hydrochloride (2%). The animal made an uneventful recovery after surgical management.

Keywords: Atresia ani, urethral diverticulum, pseudo-hermaphrodite, calf

Introduction

In mammalian species, sexual development of an individual animal depends on the sexual completion of a series of steps such as chromosomal sex, gonadal sex and phenotypic sex which are under the influenced of genetic and hormonal control mechanisms. Any disorders during the process of completion of these series of steps may result in hermaphroditism which produces infertility and sterility in such animals (Jadhao *et al.*, 1992) ^[11]. Incidence of male hermaphrodite is higher as compared to female hermaphrodite (Youngquist and Threlfall, 2007; Smith, 2009) ^[18, 16]; and occurs most commonly amongst caprines and porcine (Arthur, 1959) ^[2] than horses and dogs and very rarely observed in cattle (Bose *et al.*, 1981; Chauhan *et al.*, 2012) ^[3, 5]. In ruminants, congenital anomalies involving hypospadias, urethral diverticulum, ectopic urethra, imperforate urethra and deformities of external urethra have been described (Hunt and Allen, 1989; Weaver *et al.*, 1992; Genccelep and Alkan, 2000; Radostits *et al.*, 2007) ^[10, 17, 9, 14], which usually co-exist with other malformations (Singh *et al.*, 1989) ^[15]. Congenital anomalies of anus and rectum involving atresia ani or imperforate anus are also common in young animals (Dreyfuss and Tulleners, 1989) ^[6]. Atresia ani is classified from type I to type IV based on the anatomical position and extend of developmental anomaly of rectum (Ettinger and Feldman, 2005) ^[7]. Timely surgical intervention and correction of these anomalies are mandatory as it may become fatal due to disruption of normal physiological process (Loynachan *et al.*, 2006) ^[13]. The present study describes the diagnosis and surgical correction of Atresia ani and urethral diverticulum in a male pseudohermaphrodite calf.

Case History and Observation

A one day old pseudohermaphrodite crossbred calf was presented with history of dysuria, stranguria and absence of anal opening since its birth. On clinical evaluation, a soft mid-perineal swelling was observed and the hair around the preputial opening was wetted with urine (Fig: 1A, B). A small scrotum with multiple teat spots were seen in the ventral inguinal region (Fig: 1C, D). On abdominal pressure, a bulged structure was seen in the region of the anal opening otherwise the calf was normal from face and skeletal system. Ultrasonography revealed intact urinary bladder and also presence of anechoic fluid in the perineal swelling which confirmed urethral diverticulum by the presence of urine through aseptic centesis (Fig: 2A, B).

Treatment and Discussion

Considering the complexity of the case, surgery was done in two phases. Atresia ani was first corrected on the same day of presentation and urethral diverticulum was repaired 15 days

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following the first surgery. For the surgery of atresia ani, caudal epidural analgesia using lignocaine HCl (2 ml) was given in standing position and then the calf was positioned in sterna recumbency. A cruciate skin incision was given over the bulged area of the anus. After blunt dissection, the rectal cul-de sac was identified and exteriorized to the level of the skin and through the incision the muconium was evacuated. The rectal mucosa was everted and sutured to the skin with braided silk (no.2). Approximately, 30 ml of warm water was infused through the rectum in forward motion for complete evacuation of the impacted muconium. Post-operatively, antibiotic inj. Ceftriaxone @ 5 mg/kg was given intramuscularly, once daily for 5 days and analgesic inj. Meloxicam @ 0.2 mg/kg, once daily, intramuscularly. The wound healed without complications on 10th day (Fig.3).

For correction of urethral diverticulum, similar protocol of restraint and anesthesia was maintained under standard protocol with aseptic preparation of the site (Fig.4A). A scalpel midline incision was made over the swelling extending towards the distal border of the diverticulum. Following blunt dissection, the enlarged diverticulum was exposed for perineal urethrostomy (Fig.4B). For perineal urethrotomy, the urethral wall was incised and the mucosa of the dilated urethra was fixed to the skin with interlocking suture pattern using mersilk (2-0) to create a permanent stoma for evacuation of urine (Fig.5A). The cavity was then flushed vigorously with physiological normal saline solution to remove the debris. Post-operatively, the animal was given broad spectrum antibiotic and analgesics for 5 and 3 days respectively, along with regular antiseptic dressing of the

surgical site. On 14th day post-surgery, the urethrostomy wound healed along with formation of granulation tissue showing normal urination and evacuation through the stoma (Fig.5B). The sutures were subsequently removed and advised for further dressing of the site with antiseptic solutions (Fig.5C).

Pseudo-hermaphrodite is an intersex condition characterised with gonads of one sex but external genitalia of the opposite sex, which may vary in degree. Based on the presence of gonads, it may be classified as either male or female pseudo-hermaphrodite and the incidence of male pseudo-hermaphrodite is much more common than the female pseudo-hermaphrodite (Youngquist and Threlfall, 2007; Smith, 2009) [18, 16]. Congenital abnormalities are rare and uncommon in ruminants, however, the incidence of such abnormalities is not unusual nowadays and the numbers are increasing. Hereditary factors often play an important role in developing congenital abnormalities which can be tried for successfully correction to save the life of the animal. Urethral dilatations may develop mainly due to congenital and genital factors, bacterial urethritis or surgical interventions (Gasthuys *et al.*, 1993; Karras *et al.*, 1992) [8, 12]. Surgical excision and perineal urethrostomy was successful in this case as reported by several other researchers (Anderson *et al.*, 1993; Gençcelep and Alkan 2000) [1, 9]. Atresia ani develops due to hereditary single autosomal recessive gene (Chaudhary *et al.*, 2010) [4] which require emergency surgical intervention for the easy passage of muconium (Loynachan *et al.*, 2006) [13]. In this case, anoplasty was successfully carried out for correction of Type 2 atresia ani without any complications.

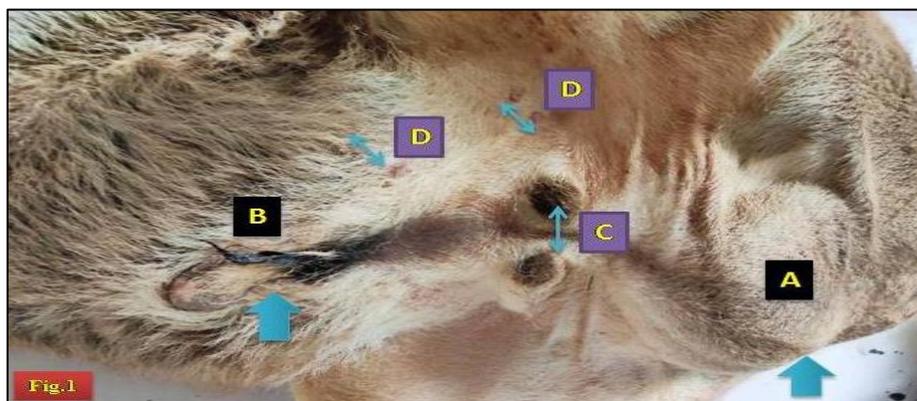


Fig 1: Photograph of the cattle calf showing (A) Mid-perineal swelling; soft liquid consistency (urethral diverticulum) (B) External preputial area wetted with urine (C) Paired scrotum (D) Multiple teats in ventral inguinal area



Fig. 2: Photograph showing (A) Centesis of the fluid from diverticulum (content is urine) (B) Anechoic fluid with presence of some hyperechoic sediments/ pus materials on ultrasonogram.



Fig 3: Complete healing after anoplasty (10th day post-operation)

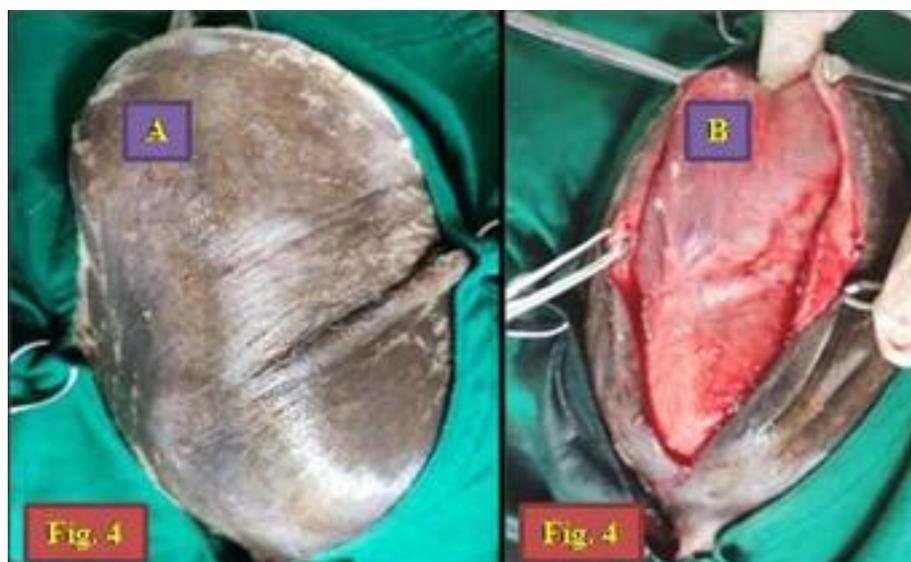


Fig 4: (A) Aseptic preparation of site for perineal urethroscopy (pre-operative) (B) Exposure of the diverticulum after blunt dissection (intra-operative)



Fig. 5: (A) Perineal urethroscopy; fixing the urethral mucosa to the skin (interlocking suture pattern) (B) 14th day post-operative; formation of granulation tissue (C) After 14th day post-operative; complete healing and suture removal

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