

Atresia ani in bovine calves and its surgical correction

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Abstract

This study was conducted to determine the occurrence of *atresia ani* in bovine calves and to delineate its surgical correction at Veterinary Teaching Hospital, Patuakhali Science and Technology University (PSTU), Bangladesh. A total of 17 congenitally affected calves were examined from September 2014 to February 2015 out of which 12 (4 female calves and 8 male calves) were diagnosed to determine *Atresia ani* with complete absence of anal opening. The occurrence of *Atresia ani* in calves was recorded as 70.59% of all other congenital defects found at Veterinary Teaching Hospital, PSTU. It was observed that the occurrence of *Atresia ani* in males was two times more than females. It was also noticed that cross bred animal (58.33%) was more susceptible to *Atresia ani* than local breed (41.67%). Surgical correction was found to be the only successful and curative approach for *Atresia ani*. After conducting low epidural anesthesia a vertical incision of about 2-2.5 cm was made to facilitate anal opening. In some cases the ill/less developed rectum was palpated, grasped and enclosed to the anal opening. Precautions were taken to reduce tissue injury, bleeding and other further complications. Further detail studies are necessary to find out molecular mechanisms of *Atresia ani* and its socioeconomic significance in livestock sector in Bangladesh.

Key words: Atresia ani, bovine calf, surgical correction.

Introduction

Congenital defects or abnormalities are the conditions existing at birth and often before birth that may be caused by either genetic or environmental factors, or combination of both. In most cases, the causes are unknown. Developmental defects may be lethal, semi-lethal, or compatible with life but causing aesthetic defects or having no effect on the animal (Johnson *et al.*, 1985). The most common environmental teratogens for bovine calves include consumption of toxic plants by the dam and maternal-fetal viral infections during gestation that cause damages to a developing fetus (Bademkiran *et al.*, 2009). Congenital abnormalities of the anus and/or rectum with associated urogenital malformations originate from abnormal embryonic development within the cloacal region. The cloaca is a common opening for the gastrointestinal, urinary and reproductive tracts (Suess *et al.*, 1982). Atresia ani is a common birth defect in cattle and is often accompanied by other congenital defects of the digestive or the urogenital tracts (Ghanem *et al.*, 2005). The term Atresia describes congenital occlusion of the lumen of the digestive tract. Failure of the anal membrane to break down during the development gives rise to the condition with imperforated anus, sometimes known as *atresia ani* (McGeady *et al.*, 2006). Crossbred calves showing great susceptibility to *Atresia ani* may be due to defective bull semen or other conditions. The atresia of the rectum results from an imperfect canalization of the gut and *Atresia ani* is a consequence of the non-perforation of the anal membrane (Carlson *et al.*, 2004). It has been reported as a most frequently encountered surgical affection in calves (Hossain *et al.*, 1986; Das & Hashim, 1996; Samad, 2008). Anal atresia affects males and females with equal frequency (Das and Hashim, 1996). This study was conducted to determine the occurrence of *Atresia ani* in Bovine calves, its distribution depending on breed and sex and surgical correction of this congenital defect.

Materials and methods

The study was conducted at Veterinary Teaching Hospital, PSTU during the period from September 2014 to February 2015 to assess the frequency of *Atresia ani* in bovine calves.

During this period bovine calves with anal Atresia were admitted for surgical correction.

Case history and clinical observations

A three-day old female bovine calf of cross breed was presented at Veterinary Teaching Hospital, PSTU with complain of non-passage faeces since birth. On clinical observation, it was found that the calf did not have anal opening and attempt of defecation. There was a soft subcutaneous swelling below the ischial arch with distension of abdomen. Also the signs of tenesmus and abdominal pain were observed but no voiding out of the faeces. The case was diagnosed as Atresia ani and handed over for surgical intervention/correction.

Instruments and appliances

Surgical handle and blade, scissors, artery forceps, blade, nylon thread, draping cloth, towel clips, tissue forceps, traumatic needle, needle holder, syringe, anaesthetic agent like 2% Lidocaine hydrochloride (Jasocaine®, Jayson Pharmaceuticals, Bangladesh) and antiseptic such as 0.001% potassium permanganate (PPM), Povidone Iodine-10% (Povisep®, Jayson Pharmaceuticals, Bangladesh).

Surgical intervention

The calf was controlled in dorso-ventral position with hind quarter being raised high on a table. The perineal region below the base of the tail was prepared for aseptic surgery (Fig. 2-A). Infiltration of local anesthesia was performed by injecting appropriate dose of 2% Lidocaine hydrochloride at the proposed site of incision (Fig. 2-B). A circular incision was made upon the bulge of the anus and the circular piece of incised skin was removed (Fig. 2-C). Liquid feces or meconium came out immediately. The patency of opening was maintained by application of simple interrupted suture between rectal mucosa and skin using nylon thread (Fig. 2-E).

Post-operative care

- Antibiotic- Gentamycin (Gentacin® 5%, Techno Drugs, Bangladesh) at the dose of 5 mg/kg was administered intramuscularly for 7 days after surgery.
- Anti-inflammatory drug- Ketoprofen (Kop-vet®, Square Pharmaceuticals Ltd., Bangladesh) was given for 5 days.

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- iii. Vaseline or glycerin was introduced into the rectum through anal opening to lubricate the incision area with the help of finger twice daily until healing of the wound.
- iv. Oil of turpentine was used as fly repellents till recovery
- v. Suturing materials were removed after 10 days of surgical operation.

Results and Discussion

In the present study a total of 17 animal were examined as congenitally affected among which 12 bovine calves were determined affected with *Atresia ani* during the study period. The overall occurrence of *Atresia ani* in the study area was calculated as 70.58% in bovine calves (Table 1). The results showed that total number of male affected with *Atresia ani* at veterinary teaching hospital, PSTU were 8 (66.67%) whereas female cases were 4 (33.34%). The ratio of the male and female cases distribution to this surgical affection was 2:1. Azizi *et al.* (2010) found no gender predilection for *Atresia ani*. Mahmudul Alam *et al.*, (2008) recorded *Atresia ani* in 15 males (13 bovine calves, 2 kids) and 2 female bovine calves. Remi-adewunmi *et al.*, (2007) noted 18 cases of *Atresia ani* among which 14 cases (77.8%) were males and 4 cases (22.2%) were females. The present study revealed that *Atresia ani* in male calves is higher than that of female calves (Fig. 01) which is supported by the study of Remi-adewunmi *et al.*, (2007) and Mahmudul Alam *et al.*, (2008). Highest occurrence of *Atresia ani* was observed in cross bred (58.33%) and lowest in Local (indigenous) breed (41.67%) and it was in agreement with the findings of Farhoodi *et al.*, (2000) who reported that cross bred calves are more prone to *Atresia ani*. On the other hand, Hossain *et al.*, (2014) reported that the percentage of indigenous/local calves affected with *Atresia ani* was 71.74% and the crossbred were 28.26% which did not match with this study.

Most affected calves initially were able to stand and suckle normally after birth. The time for onset of clinical signs of this case varied from 1 to 3 days. On collection of history it was found that owner did not observe the expulsion of meconium or feces by the calf and it was a finding o determine the case *atresia ani*. The principal clinical signs of condition were straining and bulging ate site of anal region, tenesmus, colic, depression and anorexia with abdominal distention. The absence of the anal opening was found.

Conclusion

From the present study it can be concluded that the occurrence of *Atresia ani* was higher than other congenital malformations and cross bred cattle was more affected. Congenital malformations in bovine calves may become high due to the extensive introduction of non-planned cross breeding program. Therefore, further molecular studies is needed to establish the mode of inheritance and the control measures of *Atresia ani* in bovine calf.

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Author contribution

All author (excluding 2&3) bears the equal contribution in experimental design, methodology selection, conduction of operation, data collection and analysis and write up the manuscript. The authors 2 & 3 have contribution to experimental design and methodology selection and finally approved the manuscripts.

Table 1. Cases of *Atresia ani* in veterinary teaching hospital, PSTU

Defects	Total cases	Breed		Sex		Prevalence (%)
		Cross	Indigenous	Male	Female	
<i>Atresia ani</i>	12	7 (58.33%)	5 (41.67%)	8 (66.67%)	4 (33.34%)	70.58%

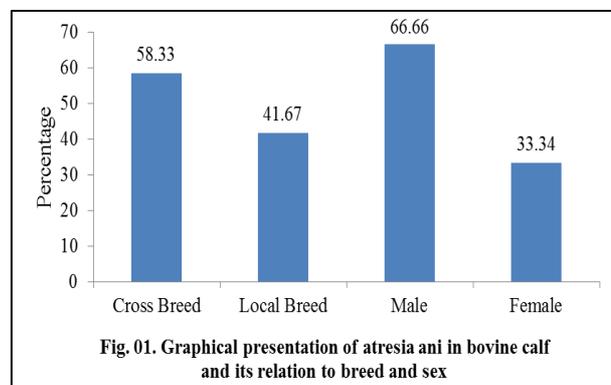


Fig. 01. Graphical presentation of atresia ani in bovine calf and its relation to breed and sex

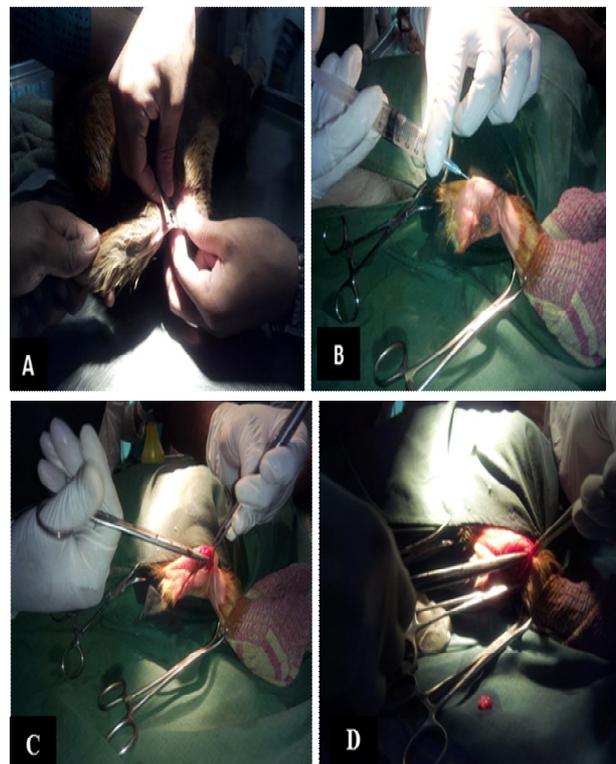




Fig. 02: (A) Preparation of bovine calf and shaving the surgical point. (B) Local infiltration was performed using injection of 2% Lidocaine hydrochloride. (C) Circular incision was made upon the bulge of the anus. (D) Identify the rectum and circular incision was made. (E) Rectal mucosa and skin was sutured by simple interrupted suture.

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