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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/23739
DOI URL: http://dx.doi.org/10.21474/IJAR01/23739

RESEARCH ARTICLE

SURGICAL CORRECTION OF CONGENITAL ATRESIA ANI IN A BOVINE NEONATAL CALF

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Manuscript Info

Manuscript History
Received: 16 April 2026
Final Accepted: 18 May 2026
Published: June 2026

Key words:-
Atresia ani, buffalo calf, congenital anomaly, surgery

Abstract

A three-day-old femalebovine calf was presented to the Veterinary Clinical Complex with a history of inability to pass faeces since birth, progressive abdominal distension, straining, and restlessness. Clinical examination revealed complete absence of an anal opening with a soft fluctuant swelling beneath the perineal skin, suggestive of congenital atresia ani. Surgical correction was performed under caudal epidural anaesthesia using a cruciate skin incision over the expected anal region. The blind rectal pouch was identified, mobilized, and sutured to the skin using simple interrupted sutures before creating the anal opening. Meconium was evacuated immediately after surgery. Postoperative treatment included broad-spectrum antibiotics, analgesics, and daily wound care. The calf was able to defecate normally during follow-up and recovered uneventfully. Early diagnosis and prompt surgical intervention resulted in a favourable outcome.

Introduction:-

Atresia ani is a congenital anorectal malformation characterized by the complete or partial absence of a normal anal opening resulting from abnormal embryological development of the terminal hindgut or failure of perforation of the anal membrane during foetal life (Chauhan *et al*., 2011). The condition prevents the normal passage of meconium and faeces, leading to progressive abdominal distension, tenesmus, anorexia, discomfort, and, if untreated, intestinal perforation, septicaemia, and death (Constable *etal*., 2017). Congenital anomalies may arise due to genetic predisposition, environmental influences, teratogenic agents, nutritional deficiencies, or a combination of these factors acting during embryogenesis (Varol*et al.*, 2018).

Atresia ani has been reported in almost all domestic animal species, including cattle, buffaloes, sheep, goats, horses, pigs, dogs, and cats, although its occurrence is relatively uncommon in buffalo calves. The anomaly is classified into four major types according to the degree of anorectal developmental failure. Type I involves anal stenosis, Type II is characterized by persistence of the anal membrane with a normally developed rectum, Type III involves a blind-ending rectum located cranial to the anus, and Type IV is characterized by discontinuity between the proximal rectum and distal anal canal (Fossum, 2024). In food animals, uncomplicated atresia ani and atresia ani et recti are the most frequently encountered forms and require prompt surgical intervention (Khan *et al*., 2019).The

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embryological basis of atresia ani is attributed to incomplete separation of the cloaca by the uro-rectal septum or failure of rupture of the anal membrane during foetal development. (Monsang*et al.,*2014). Although the exact etiology remains uncertain in most cases, hereditary transmission has been suggested in cattle and buffaloes (Constable *et al.,* 2017; Varol*et al.,* 2018).

In complicated cases, associated congenital defects such as atresia recti, rectovaginal fistula, rectourethral fistula, taillessness, hypospadias, or intestinal atresia may also be present, significantly influencing prognosis and surgical management (Azizi *et al.*, 2010; Khan *et al.,* 2019). Diagnosis is primarily based on clinical history and physical examination; however, ultrasonography, contrast radiography, or exploratory surgery may be necessary when deeper intestinal defects are suspected. Early diagnosis is essential because delayed treatment may result in severe abdominal distension, rectal rupture, peritonitis, septicaemia, and death. Therefore, prompt recognition and surgical correction are critical for successful management (Varol*et al.,* 2018; Constable *et al*., 2017).

Surgical reconstruction remains the treatment of choice for uncomplicated atresia ani. The procedure involves identifying the blind rectal pouch, mobilizing it to the perineal skin, creating a permanent anal opening, and performing a recto-cutaneous anastomosis. Various surgical techniques, including cruciate, circular, and elliptical skin incisions, have been described with satisfactory outcomes when intervention is performed during the neonatal period. But, stenosis like complication has been reported to developed in above techniques (Aslan *et al.*, 2009).Appropriate postoperative antimicrobial therapy, analgesia, and wound care are essential to minimize complications such as wound dehiscence, anal stricture, fecal contamination, and postoperative infection (Azizi *et al*., 2010; Khan *et al.,* 2019; Varol*et al.,* 2018).

Case History and Clinical Examination

A three-day-old femalebovine calf weighing approximately 32 kg was presented with a history of inability to pass faeces since birth. The owner reported continuous straining, progressive abdominal enlargement, reduced suckling, and restlessness. On clinical examination, the calf was alert but dehydrated with mild abdominal distension. No anal opening was present in the perineal region. Gentle palpation revealed a soft swelling beneath the skin caused by accumulation of meconium within the blindly ending rectum. Based on the history and clinical findings, a diagnosis of congenital atresia ani was established. Hematological values were within normal physiological limits with mild neutrophilia, consistent with stress due to fecal retention. No evidence of septicemia or significant systemic infection was observed (Table 1).

Table 1: Hematological findings in a 3-day-old bovine calf with atresia ani

Parameters	Result	Reference range
Hemoglobin (Hb, g/dL)	10.8	8.5–15.0
Packed Cell Volume (PCV, %)	33	28–40
Total Erythrocyte Count (TEC, $\times 10^6/\mu L$)	8.2	6.5–10.5
Total Leukocyte Count (TLC, $\times 10^3/\mu L$)	12.6	5.0–15.0
Neutrophils (%)	58	25–60
Lymphocytes (%)	36	35–70
Monocytes (%)	4	2–7
Eosinophils (%)	2	0–8
Basophils (%)	0	0–2
Platelet count ($\times 10^3/\mu L$)	325	150–800
MCV (fL)	40.2	35–50
MCH (pg)	13.2	11–17
MCHC (g/dL)	32.8	30–36

Surgical Management:

The perineal region was clipped and aseptically prepared (Fig. 1).The calf was restrained in sternal recumbency (Fig. 2). Caudal epidural anaesthesia and local analgesia was administered using inj.Lignocaine hydrochloride (2%). A cruciate-shaped skin incision was made at the expected site of the anus below the tail. The skin flaps were carefully reflected to expose the blind rectal pouch located approximately 2 cm beneath the skin. The rectum was

gently mobilized using blunt dissection and exteriorized to the skin surface. It was secured circumferentially to the skin using simple interrupted sutures with absorbable suture material. A small incision was then made into the rectal lumen, allowing evacuation of accumulated meconium. The rectal opening was enlarged adequately to create a functional anal opening and patency was confirmed digitally. A 2 mL syringe barrel was cut and its edges were smoothened and lubricated with liquid paraffin. This barrel was sutured in place using interrupted nylon sutures to maintain anal patency during postoperative healing.

PostoperativeManagement:
Postoperatively, the calf received inj. Ceftriaxone (20 mg/kg IM) for 5 days, Inj. Meloxicam (0.5 mg/kg IM) for 3 days, and daily antiseptic dressing of the surgical site. The owner was advised to keep the wound clean and monitor faecal passage. A fly-repellent spraywas advised in the postoperative healing period. The calf resumed normal defecation immediately postoperative, the appetite improved after 24 hours, and healing progressed without complications. Skin sutures were removed on postoperative day 20.

Discussion:-

Congenital atresia ani results from failure of embryonic development of the anal membrane and terminal rectum. Diagnosis is mainly based on the characteristic clinical presentation, including failure to pass meconium and absence of an anal opening. Surgical creation of a permanent anal opening by recto-cutaneous anastomosis is the preferred treatment. Early intervention minimizes complications such as rectal rupture, severe abdominal distension, septicaemia, and death. The successful outcome in the present case demonstrates that prompt surgical correction combined with appropriate postoperative care provides an excellent prognosis in uncomplicated cases.

Conclusion:-

Congenital atresia ani should be considered in newborncalves presented with inability to defecate since birth. Early diagnosis and timely surgical correction can successfully restore normal defecation and ensure complete recovery with minimal postoperative complications.

Figures:

Fig. 1: Absence of anal opening in the calf

Fig. 2:Positioning the calf in sternal recumbency

Fig. 3:Administration of local analgesia using 2% Lignocaine hydrochloride

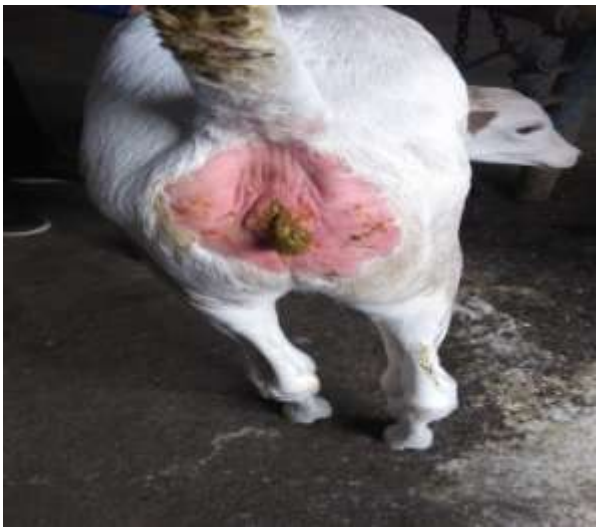

Fig. 4: Passing of feces immediately after the corrective surgery

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