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Short Communication

Surgical Rectification of Atresia Ani et Recti and Patent Urachus in a Male Cattle Calf

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Authors' Contribution
IUK and SGB designed the project. IUK and IH collected and processed the samples. IUK, IH and NUK did the experiments and wrote the Manuscript.

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Atresia aniet recti, Patent urachus, Cattle calf, Umbilicus, Ventral midline laparotomy

ABSTRACT

A 2-day old calf was presented at the Outdoor Clinic of Faculty of Veterinary and Animal Sciences, Gomal University. History reported abdominal pain and straining with unsuccessful attempts to defecate. Clinical examination revealed absence of the anal orifice, lack of a bulge sign at the anal site and dribbling of urine from the umbilicus.The case was diagnosed as atresia aniet recti with a patent urachus. After sedation, the blind terminal intestinal pouch was retracted through a caudal ventral midline laparotomy, incised to evacuate themeconium, and replaced in the pelvic canal. The rectum and anal orifice were then reconstructed using the cruciate flap incision technique at the anal site.Finally, the urachal duct was identified at the apex of the urinary bladder, and excised after ligating itclose to the bladder wall. The calf recovered uneventfully after a post-operative antibiotic and antipyretic cover for 7 days.

A 2-day old male cattle calf was presented at the Outdoor Clinic of the Gomal College of Veterinary Sciences, Gomal University (Pakistan) with presenting complaints of abdominal pain, straining, and unsuccessful attempts to defecate since 1 day (Supplementary Fig. 1). History revealed that the calf was normal at birth, active and suckling milk normally. On the second day of birth, the calf became anorectic, depressed, showed abdominal straining, pain and progressive abdominal distention. Physical examination revealed absence of anal opening, and dribbling of urine from umbilicus. With the calf in dorsal recumbency, the abdominal cavity was pressed towards the anus and the bulge checked at the site of the anus for confirmation of atresia ani or atresia aniet recti (Chauhan *et al*., 2011). The case was diagnosed as atresiaaniet recti as no bulging at the anal site was noted upon abdominal compression; furthermore, the dribbling of urine at the umbilicus provisionally confirmed a persistent patent urachus. The calf was operated.

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Results

The calf was sedated with a concomitant use of injecting XylazingHCL @ 0.3mg/kg Intra-Muscular and lignocaine 2% 5 ml High epidural at the lumbosacral space. After sedation, a caudal ventral midline laparotomy was performed and the intestine palpated till its terminal portion, which was found as a blind pouch, located at the dorsal pelvic wall, 10cm away from the site of anal atresia (Supplementary Fig. 1B). The terminal end was detached manually, incised to evacuate the meconium (Supplementary Fig. 1E) and lavaged with lukewarm normal saline. It was then replaced into the pelvic canal. After surgical reconstruction of the anal orifice (Supplementary Fig. 1E), using the cruciate flap technique, a sterile non-crushing forceps were introduced through the artificially-made anal opening, and the terminal end of the intestine was grasped and pulled outvia traction at the anal orifice, where it was sutured with the skin in a circular fashion (Supplementary Fig. 1D). Finally, colopexy was performed to further stabilize the intestinal loop.

For rectification of the patent urachus, the urachal duct was identified at the cranial vertex of the urinary bladder, whereby itwas found to be communicating with the external abdominal wall through the umbilicus. After

sharp dissections of adhesions, the urachus was isolated, ligated very close to the urinary bladder and excised.

The abdominal cavity was lavaged with lukewarm normal saline solution, and the laparotomy incision was closed in three layers as routine. Post-operatively, the calf was monitored through a 7-day course of broad-spectrum antibiotics and antipyretics. After one week, the calf recovered completely and on follow-up, no complication was reported, either.

Discussion

Ano-rectal anomalies can be satisfactorily diagnosed on the basis of clinical findings without necessitating the need of radiographic examination for disease confirmation. Based on the degree of severity, anal atresia can be divided into four types. In Type 1, there is no anal opening; in Type 2, the rectum ends as a blind pocket cranial to the imperforated anus; in Type 3, the terminal portion of the rectum lies at a greater distance from the imperforate anus and is synonymously called as atresia aniet recti, which was the case presentation; Type 4, on the other hand, is characterized by multiple intestinal atresias. Differentiation among these four types can be made using advanced imaging techniques of contrast radiography (Rahal *et al*., 2007).

Patent urachusis a condition in which the urachal duct fails to degenerate after parturition. During prenatal life, the urachus forms the communication between the bladder and the allantoic cavity for urine excretion (Rao *et al*., 2000). Failure of the duct to close at birth leads to this anomaly which is commonly found in calves; it may be associated with imperforate urethra and may additionally predispose the calf to omphalitis and ascending infection of the umbilical remnants (Hunt and Allen, 1989; Ha *et al*., 2018).

Both conditions, however, were successfully treated surgically with good survival rates. Surgical management of atresia anirequires incision at the expected anal orifice and subsequent permanent reconstruction of the anal opening. This is done by giving a cruciate skin incision and removing a circular piece of skin, which is then sutured with the terminal excised rectal loop (Azizi *et al*., 2010). Atresia aniet recti can be treated by incising through the anal area, or, in case of Type 3 atresias, approaching through a caudal ventral midline laparotomy [as was done in this case], identifying the terminal blind intestinal pouch, incising and trimming it so as to create a permanent opening and reconstructing a rectal orifice with an anal orifice by suturing it with the skin at the anal aperture induced surgically. Euthanasia is indicated if the intestinal atresia is more extensive, since the survival rate of calves with atresia aniet recti or atresia coli is reportedly low as compared to Type 1 anal atresia (Durmus, 2008). Patent urachus, likewise, requires surgical management in which the urachal duct is identified, separated and excised after ligating the duct at the apex of the bladder (Laverty and Salisbury, 2002).

Congenital anomalies in ruminants (Simon *et al*., 2011), usually occur in association with various other malformations, such as rectovaginal fistula (Bademkiran *et al*., 2009; Shakoor *et al*., 2012), absence of the penis, urethra and the scrotal raphe in the male (Abd-Almaseeh, 2012), vaginal agenesis in the female, and urinary bladder agenesis (Sutharetal., 2010).

The present case, diagnosed as atresia aniet recti (Type-3), was associated with a patent urachus, which was further confirmed at surgery. The history and clinical signs were similar as documented earlier (Chauhan *et al*., 2011; Suthar *et al*., 2010). Contrary to reports of unfavorable prognosis for Type 3 atresias, this case was successfully treated surgically by reconstructing the anal opening, identifying and isolating the terminal end of the intestine through a caudal ventral midline laparotomy, replacing it into the pelvic canal, and subsequent suturing of the terminal part of the intestine subcutaneously with the aperture on the skin of the artificially-made anus; and the calf completely recovered, when examined at a follow-up of 07 days.

Supplementary material

There is supplementary material associated with this article. Access the material online at: https://dx.doi.org/10.17582/journal.pjz/20180424050426

Statement of conflict of interest

The authors declare that there is no conflict of interest.

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