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Atresia Ani Et Vulva and Rectovaginal Fistula: A Clinical Presentation in a Calf

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ABSTRACT

Anomalies are not uncommon in various domestic animal species, particularly among ruminants. However, when examining anomalies collectively, those pertaining to the urogenital system in calves and lambs are relatively infrequent occurrences. Instances of atresia ani, atresia recti, intestinal atresia, and rectovaginal fistula are more prevalent in calves. While these anomalies may manifest individually or in combination, cases involving atresia vulva are notably rare in such occurrences. The subject of this case report was a 5-day-old female Jersey cross calf, weighing 11 kg. The calf was presented to the Surgery clinic at Siirt University Faculty of Veterinary Medicine Animal Hospital, with the primary concerns being the absence of vulvar lips and issues related to anal patency. Following clinical, radiologic, and ultrasonographic evaluations, a diagnosis of atresia ani et vulva, accompanied by a rectovaginal fistula, was established. The decision was made to proceed with operative intervention. During the operative intervention, the anus hole was opened appropriately using the classical atresia sudden operative intervention method and the vulva was opened using the vaginoplasty method. During the operation, feces and urine output were checked, and the wound lips and rectovaginal fistula were sutured in accordance with the technique. Follow-up visits indicated normal defecation and urination, with the wound lips healing without complications.

INTRODUCTION

Various anomalies can manifest in domestic animal species, particularly ruminants. While the precise pathogenesis of many of these anomalies remains unclear, genetic and environmental factors, individually or in combination, are suggested contributors. Environmental factors such as the consumption of teratogenic poisonous plants in proximity to dams and maternal exposure to viral diseases during the fetal period are identified as key causative elements. The distribution of these anomalies among body systems has been documented according to various sources, approximately 24% in the musculoskeletal system, 13% in the digestive and respiratory systems, 22% in the central nervous system, 4% in the abdominal wall and urogenital system, 3% in the cardiovascular system, 4% in the cardiovascular system. 20% are other anomalies (Bademkıran et al., 2009; Kılıç and Sarıerler 2004; Kılıç et al., 2005).

Within these systems, anomalies associated with the urogenital system in calves have been documented, encompassing conditions such as atresia ani, atresia recti, intestinal atresia, rectovaginal fistula, and atresia vulva (Oral et al., 2013). These anomalies may manifest individually or concurrently in calves. Atresia ani and intestinal atresia are commonly observed conditions in calves. While rectovaginal fistula may occasionally accompany these anomalies, the association with atresia vulva is infrequent and considered a rare anomaly.

In the context of atresia cases, intestinal atresia denotes the absence or termination of a segment of the intestine as a blind pouch, atresia recti involves the rectum terminating blindly under the skin in the anal region, and atresia ani is characterized by the closure of the anus. Intestinal atresia is categorized into four main types: Type I involves the closure of the intestinal lumen with a membranous curtain, Type II is characterized by the termination of the last part of the colon as a structure without peristalsis, with or without a lumen, Type III is defined as the termination of the colon with a blind end in the abdominal cavity, and Type IV presents as the blind sorghum-like termination of the colon, resembling Type III. Additionally, the simultaneous occurrence of multiple intestinal atresia is

termed multiple intestinal atresia, and the coexistence of intestinal atresia with a closed anus is termed atresia ani et recti (Bademkıran et al., 2009).

Calves with atresia ani typically exhibit a normal appearance after birth, suckling like healthy counterparts for initial days, and may appear unaffected. However, restlessness emerges within a few days when owners, upon inspection, discover the absence of an anus opening. Key clinical signs in affected calves include bilateral abdominal distension, restlessness, depression, inability to strain and defecate, and swelling in the anal area. The conclusive diagnosis is established through clinical examinations and radiography revealing the extension of the intestinal segment to the absent anus opening (Rahal et al., 2007).

Rectovaginal fistula is characterized by the development of a fistula between the dorsal wall of the vagina and the ventral wall of the rectum, leading to complications such as vaginal irritation, cystitis, reduced conception rates, and megacolon in animals as feces pass into the vaginal cavity and urine into the rectum (Mainau and Mantece, 2011). Conversely, vulvar atresia is defined by the absence of the normal opening of the vagina, with fused outer labia covering the typical canal. The simultaneous occurrence of these anomalies in calves is uncommon, and in cases of atresia, operative intervention is reported as a feasible treatment option when the condition affects an organ or system and is not overly complex (Özaydın, 1996).

This case report discusses a rare anomaly in a calf, specifically focusing on atresia ani et vulva with an associated rectovaginal fistula.

MATERIALS AND METHODS

The subject of this case report was a 5-day-old female Jersey crossbred calf weighing 11 kg, presented to Siirt University Faculty of Veterinary Medicine Animal Hospital Surgery clinic with the chief complaint of a closed anus and vulva. Initial routine clinical examinations, including assessments of mucous membranes, heart rate, respiratory rate, capillary refill time (CRT), peripheral pulse rate and quality, and thoracic auscultation, did not indicate any abnormalities. Nevertheless, specific examination findings disclosed an orange-sized swelling in the perianal region with a fluctuant consistency. Both the anus and vulva lips were observed to be underdeveloped, accompanied by bilateral abdominal distension. The calf exhibited persistent straining and assumed a defecation position without the ability to defecate and urinate (Figure 1). Radiologic and ultrasonographic examinations unveiled the progression of a fluid, presumed to be meconium, to the terminal part of the rectum. The external swelling in the perianal region was found to contain a liquid-like content. Consequently, the patient was diagnosed with atresia ani et vulva, prompting the decision for operative intervention.

Figure 1. Preoprative perianal swelling

For the operative procedure under general anesthesia, the patient received a sedative dose of xylazine HCL (Xylazinbio 2%, Intermed, Ankara) at 0.2 mg/kg for sedation and an induction dose of ketamine HCL (Ketasol 10%, Interhas, Ankara) at 10 mg/kg, administered intramuscularly. Following the shaving of the operative area, the patient was positioned on the operation table in the sternoabdominal posture and prepared for the operative intervention following the principles of aseptic surgery. Initially, a puncture was executed from the ventral part of the bulge using a scalpel. The opened hole was enlarged by approximately 1 to 2 cm with Metzenbaum scissors, allowing for the complete evacuation of meconium. Following the thorough evacuation of meconium, the area was irrigated with a 0.9% saline solution. Subsequently, an elliptical incision, approximately matching the size of the anus entrance, was made in the region where the anus should be located, resembling the procedure in cases of atresia ani, to establish the anus opening. The incision line, comprising the skin and rectal mucosa, was sutured with simple separate sutures utilizing polyglycolic acid (USP: 2/0, Alcasorb®, Katsan) thread material. Delicate manipulation of the area exposed an opening between the dorsal wall of the vagina and the ventral wall of the rectum, leading to the additional diagnosis of a rectovaginal fistula in the patient. Subsequently, the fistula canal between the rectum and vaginal walls was repaired using an X suture technique applied to the vaginal wall. For vaginoplasty, the incision was extended dorsally in an oval shape from the line of the initial puncture. A suitable piece of skin was excised, facilitating the creation of the vulva opening (Figure 2). The wound incision was sutured using polyglycolic acid (USP: 2/0, Alcasorb®, Katsan) suture material employing a simple interrupted suture technique. Before concluding the operative intervention to mitigate potential complications, a two-way rubber feeding catheter, suitable for the anatomy to avoid irritation, was introduced into the vagina. This facilitated the complete discharge of meconium mixed with urine from the vagina. The vaginal cavity was thoroughly irrigated with a 0.9% saline solution to ensure the absence of fecal particles. Subsequently, the presence of the orificium urethra externa opening in the ventral wall of the vagina was assessed, confirming its appropriate location. To verify the patient's ability to urinate normally, gradual pressure was applied to the caudal abdomen from the ventral side by a non-sterile assistant, resulting in the observation of the patient passing urine comfortably.

Figure 2. Perioperative appearance of the anus and vulva

Postoperatively, the patient received a single subcutaneous dose of 0,3mg/kg meloxicam (Meloxicam, Bavet, Istanbul) and intramuscular administration of

22.000 IU /kg penicillin G potassium for seven days (Vetimycin, Vetas, Istanbul). As part of the postoperative care, it was advised to apply 10% povidone iodine solution to the suture line twice daily. On the 5th and 15th postoperative days, the patient demonstrated normal stool and urination, and the wound area continued to heal without complications (Figure 3). On the 45th postoperative day, the owner was informed via phone that the patient was successfully passing normal feces and urine. Upon reviewing photographs of the surgical site sent by the owner, it was confirmed that the incision line had completely healed (Figure 4).

Figure 3. Postoperative day 15

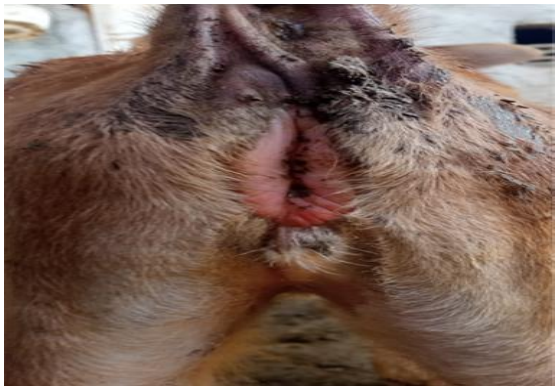

Figure 4. Postoperative day 45

RESULTS AND DISCUSSION

Genetic or non-genetic congenital anomalies can impact a single organ or an entire bodily system (Tyagi and Singh, 1999). While the pathogenesis of non-genetic congenital anomalies remains incompletely understood, these anomalies have been attributed to various factors such as mutations, viral agents, nutritional influences, and traumatic effects on the amniotic sac during early pregnancy. Genetic congenital anomalies are reported to be inherited through autosomal recessive genes, and in instances where this gene transfer is disrupted, the cells responsible for forming organ openings during fetal development may not invaginate, leading to a lack of ruptures necessary for opening formation, ultimately resulting in agenesis or atresia in living organisms (Timurkan and Mert, 1987; Newman et al., 1999; Noh et al., 2003). In the present case, the etiological cause of the anomaly observed remains uncertain, as the anamnesis from the owner and clinical examinations were insufficient to unveil whether the anomaly is of genetic or environmental origin.

In domestic animals, particularly in calves and lambs, anomalies such as atresia ani, atresia recti, rectovaginal fistula, vaginourethral agenesis, or vulvar atresia have been documented (Shetty et al., 1978). While these anomalies typically manifest individually, encountering multiple anomalies in the same animal is uncommon. The most prevalent anomaly in calves is atresia ani, occasionally accompanied by a rectovaginal fistula, but cases involving vulvar atresia are infrequently reported (Tyagi and Singh, 1999). In this particular case, a rare occurrence was noted where three distinct anomalies coexisted in a single calf: atresia ani, atresia vulva, and rectovaginal fistula. It is noteworthy that this is an uncommon scenario, and the fact that the animal continued to live adds further rarity to the case.

It has been noted that operative intervention is the sole treatment option in cases of atresia, with the prognosis influenced by the number of systems affected by the anomaly (Noden and de Lahunta, 1985; Özaydın 1996). In this specific case, the prognosis was initially deemed poor due to the concurrent presence of multiple anomalies. Nevertheless, despite this challenging scenario, the decision to proceed with the operation resulted in a surprisingly favorable prognosis during the animal's recovery process, contrary to initial expectations.

The operative intervention involves the removal of an oval-shaped piece of tissue suitable for the vulvar opening, creating a permanent urogenital opening during the surgical procedure (Yılmaz et al., 2014). Careful consideration of the anatomical structure guided the removal of excess skin, ensuring that an appropriate piece was excised without compromising the vulvar entrance. Subsequently, the position of the orificium uretra externa was evaluated, confirming the successful occurrence of urine outflow through this opening.

In cases of rectovaginal fistula, the passage of feces into the vaginal cavity and urine into the rectum has been reported to lead to pathologies such as vaginal irritation, cystitis, decreased conception rate, and megacolon in animals (Kumar et al., 2020). Notably, vaginal irrigation was not mentioned in some case reports addressing the surgical repair of atresia ani and congenital rectovaginal fistula in calves (Shakoor et al., 2012). In another case report involving surgical treatment of atresia ani complicated with a rectovaginal fistula in a Sahiwal breed calf, vaginal irrigation was also not performed (Kumar et al., 2020). When the case report of Kumar et al is examined, it becomes clear that irrigation is not applied consistently in cases of atresia sudden and rectovaginal fistula to prevent possible complications that may arise from the passage of feces into the vaginal canal. The assumption may be that the feces will flow directly into the external environment. However, in this case, considering the increased risk of complications due to the closed vulva, irrigation of the vaginal canal was deemed necessary during the surgery. Therefore, in cases of sudden atresia with rectovaginal fistula, it is recommended to consider vaginal irrigation due to possible complications.

In conclusion, the presentation of atresia ani et vulva accompanied by a rectovaginal fistula in a calf is a rare occurrence in veterinary medicine. Despite reports in the literature suggesting a poor prognosis with an increasing number of anomalies in the same animal, the desired improvement was achieved following operative intervention in this particular case. We believe that sharing

this case will be valuable for our colleagues practicing large animal medicine.

Acknowledgement

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Conflict of Interest

The authors declare that they have no competing interests.

Authorship contributions

Concept: M.B.A., Design: M.B.A., S.K., Data Collection or Processing: M.B.A., K.S., B.E., Analysis or Interpretation: M.B.A., S.K., A.G., K.S., Literature Search: M.B.A., S.K., A.G., B.E., Writing: M.B.A., S.K., K.S., B.E.

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