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Case Report

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Surgical Management and Outcome of Atresia Coli in a Holstein Calf

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ABSTRACT

Atresia coli is a congenital defect in neonatal calves characterized by the absence or obstruction of a segment of the colon, resulting in intestinal blockage. In such cases, treatment options are limited to surgical intervention or euthanasia. Treatment decisions should primarily consider the animal's general condition, postoperative care, potential complications, and associated costs. In this case report, a colonic fistula (colostomy) was created in a Holstein calf, which was hospitalized and monitored for six months. No significant complications were recorded during the observation period. The calf adapted well to the farm environment; however, its development was slower compared to its peers, and it appeared visibly weak at six months of age. This case highlights the importance of early diagnosis, appropriate surgical techniques, and meticulous postoperative care in achieving favorable outcomes.

1. INTRODUCTION

Atresia coli is a congenital condition characterized by the complete absence of lumen formation in any segment of the colon. The most commonly affected intestinal region is the spiral segment of the ascending colon (Steiner, 2004; Anderson, 2008; Meylan, 2008). While the condition is suspected to have a hereditary basis, environmental factors may also play a contributing role. Clinically, calves initially appear healthy; however, over time, progressive bilateral abdominal distension, abdominal pain, intermittent straining, increasing depression, and weakness become evident. The sucking reflex is typically present in the early stages but diminishes as the disease progresses, eventually leading to anorexia. The most notable symptom is the absence of defecation despite the presence of a normally developed anus and rectum (Fierheller, 2002; Steiner, 2004; Mulon, 2005; Anderson, 2008; Meylan, 2008).

In most cases, diagnosis can be established through anamnesis and physical examination findings (Steiner, 2004; Meylan, 2008). However, imaging techniques such as radiography and ultrasonography are utilized for differential diagnosis, while definitive diagnosis is achieved through diagnostic laparotomy (Fierheller, 2002; Steiner, 2004; Anderson, 2008; Meylan, 2008). The management of atresia coli cases relies on early diagnosis, supportive care, and surgical intervention, all of which are critical for a favorable prognosis (Azizi et al., 2010). In cases where surgical treatment is not accepted by the owners, immediate euthanasia is recommended, as progression of the condition often leads to fatal complications such as autointoxication, circulatory failure, or peritonitis due to intestinal perforation (Meylan, 2008).

2. CASE PRESENTATION

A six-day-old male Holstein calf was presented to the Surgery Clinic of Selcuk University Faculty of Veterinary Medicine with a history of an absence of defecation and abdominal distension. Clinical examination revealed a normal respiratory rate (30/min) and heart rate (120/min), but the body temperature was below normal (37.0°C). Additionally, marked abdominal distension, more pronounced on the right side, a diminished sucking reflex, and moderate dehydration were observed.

Finger exploration through the rectum did not reveal the presence of meconium. The rectal examination using a flexible catheter revealed that the catheter had advanced approximately 20 cm. Irrigation with warm physiological saline resulted in the return of a mucus-like fluid (Fig. 1). A distended cecum and colon were palpable in the right paralumbar fossa. Based on the clinical history and examination findings, atresia coli was suspected. Lateral abdominal radiographs confirmed the diagnosis by demonstrating gas-distended intestinal segments. Following owner consent, immediate surgical intervention was planned.

In the preoperative period, the primary focus was on restoring body temperature and correcting dehydration. Intravenous rehydration was initiated using 0.9% NaCl (Polifarma, Türkiye). After corrective fluid therapy, 1.5 mL of subcutaneous meloxicam (Bavet Meloxicam, Bavet, Türkiye) and 3.2 mL of intramuscular benzylpenicillin + dihydrostreptomycin (Reptopen, 50 mL, Ceva, Türkiye) were administered. The right abdominal wall was widely clipped, ensuring the paralumbar fossa remained the central focus. Sedation was induced with an intramuscular injection of 0.4 mL of xylazine (XYLAZIN BIO 2%, Bioveta, Czech Republic), followed by local infiltration anesthesia with 15 mL of lidocaine (Adokain, Sanovel, Türkiye) applied to the right paralumbar fossa.

Fig. 1. Appearance of mucous-like content coming from the rectum after irrigation.

The calf was positioned in lateral recumbency on the surgical table, and the surgical site was prepared aseptically and draped in a sterile manner. A routine laparotomy was performed through the right paralumbar fossa. After entering the abdominal cavity,

the organs were examined for pathological changes and/or anomalies. The atretic intestinal segment (blind end) was identified, with atresia occurring in the spiral colon (Fig. 2).

Despite intestinal distension, no perforation or intra-abdominal adhesions were detected. The segment of the descending colon connected to the rectum was found to be markedly thin, short, and lacking a normal physiological appearance. The accumulated gas in the distended cecum and spiral colon was relieved via cecal puncture. The atretic blind intestinal segment was then bluntly dissected and mobilized approximately 15 cm from the surrounding tissues.

Since anastomosis was not feasible, a colostomy was performed. The atretic intestinal segment was exteriorized and clamped using intestinal forceps, after which its blind end was resected. Extreme caution was taken to prevent contamination while the intestinal contents were evacuated, and the free intestinal segment was thoroughly flushed with physiological saline. The intestinal section was then sutured to the peritoneum and transverse abdominal muscles in a circular manner with 6-8 interrupted seromuscular sutures using polyglycolic acid no. 2-0 (Alcasorb, Katsan, Türkiye). The same procedure was repeated a little more superficially to attach it to the external abdominal oblique muscle. Finally, the intestinal end was sutured using with interrupted sutures to include the skin. The operation line outside the fistula was closed in accordance with the routine (Fig. 3).

3. POSTOPERATIVE CARE AND OUTCOME

Postoperatively, the calf was subjected to close monitoring in the hospitalisation unit for a period of one month, during which time it received the standard postoperative care. Wound dressings were applied for a period of 10 days, and antibiotic therapy was continued. Defecation was observed the day after surgery, thus allowing for the gradual introduction of oral feeding. During the process of wound care, the fistula site was irrigated with warm water, and the suture line was treated with terramycin antibiotic spray (Terramycin, Zoetis, Germany). Sutures were removed on day 10, and no postoperative complications were encountered during this period.

After weaning, the calf was released to other calves of the same age on the university farm. The only problem encountered in the calf, which was under the supervision of a caretaker and checked by us at regular intervals, was the adhesion that occurred in the fistula hole when it was approximately 2 months old. Since this was noticed early, it was easily opened with a simple intervention.

The surgical intervention was well-tolerated by the calf, allowing it to resume its normal activities. The fistula orifice remained inconspicuous due to hair coverage, and defecation occurred without complications. However, the most notable concern was the calf's significantly delayed growth compared to its peers. By six months of age, it had reached a live weight of only 128 kilograms (Fig. 4).

4. DISCUSSION

Atresia coli is the most commonly encountered intestinal anomaly in calves after anorectal malformations. Its etiology remains unclear. The fact that affected calves typically present with similar histories and clinical symptoms often facilitates accurate diagnosis. Although this anomaly has been reported in various breeds, Holstein calves appear to be the most frequently affected. In cases of atresia coli, which are fatal if left untreated, early and accurate diagnosis, effective surgical intervention, and meticulous postoperative care play a crucial role in case management (Fierheller, 2002; Steiner, 2004; Mulon, 2005; Meylan, 2008).

Early and correct diagnosis is very important as it will enable early intervention. In this context, contrast radiography (Seong et al., 2011; Abouelnasr et al., 2012; Saibaba et al., 2016), colonoscopy (Onyay et al., 2020), and some biomarkers (Yildiz et al., 2018) have been reported to have diagnostic importance. In calves that have been diagnosed early and therefore have not yet developed complications from atresia, the only treatment option is surgical intervention. In cases of atresia coli, anatomosis, cecostomy, and colostomy are applied operatively. The intestinal segment where atresia is formed and the type of atresia play a decisive role in determining which of these techniques will be applied (Koc et al., 2001; Fierheller, 2002; Steiner, 2004; Mulon, 2005; Meylan, 2008). In the presented case, the descending colon was not suitable for anastomosis and the type of atresia (Type III) made colostomy appropriate. The laparotomy was performed through the right abdominal wall and the literature data (Fierheller, 2002; Azizi et al., 2010) were taken into account in the positioning of the colon fistula.

In calves that have undergone operative treatment, different survival rates and therefore different opinions regarding prognosis have been reported. Koc et al. (2001) stated that the survival rate in calves diagnosed with atresia coli is dependent on the time elapsed after birth, the general condition of the animal, the supportive treatment given and the suitability of the intestinal segment with atresia for anastomosis. Kilic and Sarierler (2004) similarly related the survival rate to early diagnosis, the affected bowel segment and the success of operative intervention. Atalan et al. (2003), Durmus (2009), Göksel (2015), and Yurdakul (2019) reported that the survival rate was low in calves with atresia coli. Alkan et al. (2002) stated that the colostomy technique can be used for short-term survival in calves with poor condition. Similarly, Azizi et al. (2010) reported that

Fig. 2. Appearance of blindly terminated atretic intestine.

the survival rate was 73% after colostomy surgery on 14 calves and that it could be used for short-term survival.

Fig. 3. Postoperative view of the operating line and colostomy fistula.

In the presented case, the calf demonstrated an ability to adapt to its normal life and to the hierarchical order within the herd, reaching the age of six months without complications related to the surgical intervention. However, when literature data is evaluated, it is seen that the focus is on complications encountered in the postoperative period. The most prevalent complications include peritonitis, anastomosis defects, diarrhea, incisional infections, chronic cecal dilatation, spiral colon obstructions and obstructions due to intestinal adhesions (Steiner, 2004; Mulon, 2005; Anderson, 2008; Meylan, 2008). In this context, the significance of operative technique and postoperative management becomes particularly salient. In the presented case, during the colostomy procedure, the intestinal segment was sutured to different muscle groups in the form of two different circular lines. In this way, possible fistula complications are prevented and a resistance is created that prevents the continuous flow of feces depending on the tone of the muscles. Therefore, unless the intestines reached a certain level of fullness, there was no feces discharge, and contamination that would occur due to the continuous flow of feces was prevented to some extent.

Another important issue is that the postoperative process is managed directly by a member of the operation team. In the presented case, since the entire process was under our control, medical treatment was continued without interruption and no management weakness was allowed that would lead to complications. In the reported cases (Koc et al., 2001; Azizi et al., 2010), it was observed that postoperative follow-up and initiative were left to the patients' owners.

Fig. 4. Appearance of the calf at six months of age.

Although the process was well managed in our case, another important point that should be emphasized is that our calf could only reach 128 kg live weight at the age of 6 months. This observed developmental delay has also been reported by other researchers (Koc et al., 2001; Alkan et al., 2002; Kilic and Sarierler, 2004; Göksel, 2015).

5. CONCLUSION

In conclusion, when considering all aspects of cases of atresia coli encountered in calves, it is clear that the process is quite complex. In these types of anomalies, which require extensive studies from an economic perspective, it should be remembered that operative intervention is only aimed at keeping the calf alive. Naturally, euthanasia appears as another option. However, if treatment is decided upon, operative technique and postoperative care have been shown to be very important.

References

Abouelnasr, K., Ishii, M., Inokuma, H., Kobayashi, Y., Lee, K., & Yamada, K. (2012). Atresia coli in a Japanese black calf diagnosed by a barium sulphate enema contrast radiograph in the standing position: a case report. Veterinární medicína, 57(7), 376.

Alkan, F., Koc, Y., & Ceylan, C. (2002). The surgical repair of calves with atresia coli. Indian Veterinary Journal, 79, 841-843.

Anderson, D. E. (2008). Surgical diseases of the small intestine. Veterinary Clinics of North America: Food Animal Practice, 24(2), 383-401.

Atalan, G., Ozaydın, I., Kilic, E., Cihan, M., & Kamiloglu, A. (2003). Cases of intestinal atresia and their surgical treatment in calves: 54 cases (1992-2000). Kafkas University Journal of Veterinary Faculty, 9(2), 113-118.

Azizi, S., Mohammadi, R., & Mohammadpour, I. (2010). Surgical repair and management of congenital intestinal atresia in 68 calves. Veterinary Surgery, 39(1), 115-120.

Durmus, A. S. (2009). Congenital intestinal atresia in calves. Indian Veterinary Journal, 86(7), 737.

Fierheller, E. (2002). Abdominal disease in calves: a diagnostic challenge. Large Animal Veterinary Rounds, 2(3), 1-6.

Göksel, B. A. (2015). Clinical and surgical approaches in intestinal atresia cases in calves. Master's thesis, Afyon Kocatepe University, Institute of Health Sciences.

Kilic, N., & Sarierler, M. (2004). Congenital intestinal atresia in calves: 61 cases. Revue de Médecine Vétérinaire, 155(7), 381-384.

Koc, Y., Alkan, F., Ceylan, C., & Birdane, F. (2001). Evaluation of clinical and surgical approaches in 22 calves with colonic atresia. Journal of Veterinary Sciences, 17(1), 27-34.

Meylan, M. (2008). Surgery of the bovine large intestine. Veterinary Clinics of North America: Food Animal Practice, 24(3), 479-496.

Mulon, P. Y., & Desrochers, A. (2005). Surgical abdomen of the calf. Veterinary Clinics: Food Animal Practice, 21(1), 101-132.

Onyay, T., Inal, K. S., Ozbakir, B. D., Nisbet, H. O., Yardimci, C., Saglam, K., & Ozak, A. (2020). Colonoscopic diagnosis of atresia coli in calves: 19 cases (2016-2018). Kafkas University Journal of Veterinary Faculty, 26(2), 27.

Saibaba, M., Veena, P., Rao, C. M., & Phaneendra, M. S. S. V. (2016). Atresia coli in a HF calf diagnosed by a barium sulphate enema contrast radiograph: A case report. International Journal of Scientific and Technical Advancements, 2(1), 79-80.

Seong, Y. S., & Jang, K. H. (2011). Radiographic diagnosis of atresia coli in a Korean native calf. Journal of veterinary clinics, 28(3), 336-338.

Steiner, A. (2004). Surgery of the colon. In Fathman, E. M., & Merchant, T. (Eds.), Farm Animal Surgery, 10th ed., pp. 472-477. Missouri, USA: Elsevier.

Yildiz, R., Ok, M., Ider, M., Aydogdu, U., Naseri, A., Parlak, K., & Gulersoy, E. (2018). Evaluation of intestinal damage biomarkers in calves with atresia coli. Journal of Veterinary Research, 62(3), 379.

Yurdakul, I. (2019). Clinical and treatment evaluation of congenital intestinal atresia cases in calves. Van Veterinary Journal, 2019, 30(1), 31-36.