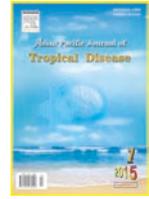




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Report of congenital colonobladder fistula with atresia ani in a lamb and treatment by surgery

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ABSTRACT

Colonobladder fistula and anal atresia, including congenital malformations in animals, occur due to genetics, environmental factors and vascular insufficiency. A male lamb was brought to a private veterinary clinic in Amol city, Mazandaran province, Iran. The lamb had clinical symptoms such as lethargy, dehydration, closed anus and watery feces in the genital organ. After taking radiograph and clinical examinations, it was found that the lamb was suffering from both colonobladder fistula and anal atresia; and emergency surgery was done. First, aseptic conditions and analgesia at the lumbosacral region of the trunk were put into practice and after cutting the abdominal muscles, accumulated feces in intestine were removed via an intestinal incision. The intestine was separated from the bladder via an incision and the bladder was sutured. Then, after creating an artificial hole in the base of the tail as the animal's new anus, the intestine was sutured to the original anus. At the end of surgery, serum therapy with sugar-salt dextrose 5% NaCl 0.9% solution and antibiotic therapy with penicillin and streptomycin were performed. This report is the first report of an unusual lamb with anal atresia and colonobladder fistula in the north of Iran. This surgery was achievable and is an obligatory surgery in affected animal rather than alternative euthanasia.

1. Introduction

Congenital defects, abnormalities of structure or function present at birth, may be caused by genetic or environmental factors, or a combination of both. In many cases, the causes are unknown. The most common bovine environmental teratogens include toxic plants consumed by the dam and maternal-fetal viral infections during gestation[1]. Deformities of external genital organs are of special premonition because of their repercussion on the future generations. These defects are observed in different parts of the body, especially the last part of the digestive tract like atresia ani[2]. Four major types of intestinal atresia have been described. Type I atresia is a mucosal blockage within the intestinal lumen. In animals with type II atresia, the proximal segment terminates in a blind end and two ends of the distal segment are joined by a fibrous cord devoid of lumen. Type IIIa atresia is similar to type II except that the proximal and the distal

blind ends are completely separated and there is a mesenteric defect corresponding to the missing segment of intestine. Animals with type IIIb atresia have a coiled distal segment of intestine. Type IV atresia involves multiple sites of atresia[3]. During early fetal stages, a thin anal membrane will separate the ectodermal anal canal from the endodermal intestine. Normally, this membrane would rupture, and the two parts unify before birth. Failure of this membrane to rupture during fetal development will cause atresia ani. Failure of intestinal canalization, failure in proctodeum invagination, failure in development of the dorsal part of the cloacal plate, or disruption of the anal blood supply can also cause atresia ani[4]. This congenital anomaly has been reported in all domestic animals. It is one of the quite frequently found defects of intestine among sheep because of recessive gene[2]. Atresia ani is the most common intestinal defect in sheep and is believed to be caused by an autosomal recessive gene. In a series of 64 cases of Atresia ani in sheep, 42 (62%) were associated with defects of other body systems, especially the urogenital and musculoskeletal systems[3,4]. Affected animals may survive for up to 10 days and can be identified by their depression, anorexia, colic, marked gradual abdominal distension and lack of feces[2]. Atresia ani should be treated by surgical operation to solve

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the problem, improve body weight gain, and reduce economic loss caused by this defect[1]. Colonobladder fistula is a congenital defect and rare condition that colon and bladder are connected by a duct and colon contents are inserted to bladder. This abnormality is like anal atresia and has more genetic background so that it is transferable to the later generations. Symptoms of this disease include lethargy, loss of body water, closed anus and watery feces in the genital organ. Surgery is the only treatment of these disorders and use of preventive methods are very effective in these types of disorders. Anal atresia with colonobladder fistula in small ruminant is not routinely attempted in veterinary practice and this report presents a rare case of atresia ani with colonobladder fistula in a male lamb, which was treated successfully by surgical intervention.

2. Case report

2.1. Methods and materials

A domestic male lamb was brought to a private veterinary clinic in Amol city, Mazandaran province, Iran. The animal had clinical symptoms such as abdominal pain, closed anus and watery feces in the genital organ and a gurgling sound was heard in the ventral abdominal region. The heart rate was 135 beats/min, the respiratory rate was 50 breaths/min. Radiograph showed that colon and bladder were connected by ducts and that all intestinal contents entered to bladder but the urethra had not been blocked after the catheterization. Due to anal atresia, colon was completely specified and its size was greater than normal size (Figure 1).

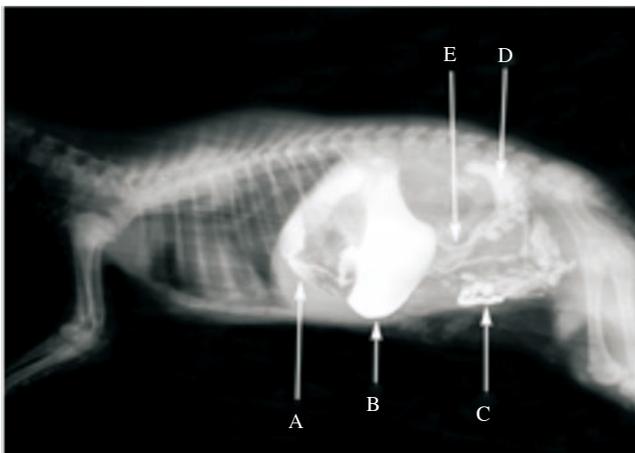


Figure 1. A: Cecum B: Colon C: Bladder D&E: Fistuls

Before surgery, aseptic conditions were created. For colonobladder surgery, local analgesia was performed by injecting lidocaine 2% (Nasr Pharmaceutical Co., Iran) solution at the proposed site of incision in lumbosacral region. After cutting the abdominal muscles (external oblique abdominal muscle, internal oblique abdominal muscle, rectus abdominal muscle, transverse abdominal muscle), colon was removed (Figure 2) and an incision 3 cm in length was made in the anti-mesenteric region of intestine so that feces could be removed by milking method. After that, intestine was washed via normal saline solution and the region of the incision was sutured by Pds 4/0 with cushing-lambert pattern. The bladder was separated from intestinal junction via an incision and fistuls were cut and then sutured. Then bladder was washed via normal saline solution and the region of the incision was sutured by Pds 4/0 with cushing pattern.



Figure 2. Colonobladder fistul.

Then for atresia ani surgery, perineal region below the base of the tail was prepared for aseptic surgery. Local analgesia was performed by injecting lidocaine 2% (Nasr Pharmaceutical Co., Iran) solution at the proposed site of incision. A circular incision was made upon the bulge of the anus and the circular piece of incised skin was removed. Skin and rectal mucosa were sutured by using nylon 2/0 with simple interrupted pattern (Figure 3).



Figure 3. Correction of atresia ani. Atresia ani reconstruction through anoplasty was performed following colostomy closure in a lamb.

Post-operatively, the surgical wound was cleaned and dressed regularly with liquid povidone iodine and meanwhile, ointment acrilin (Sina Pharmaceutical Co., Iran) was applied daily till recovery. The sutures were removed on the 10th post-operative day. Then, abdominal cavity was washed with normal saline solution and external and internal abdominal muscles were sutured by using dexon 2/0 with simple continuous pattern while the skin was sutured by using nylon 2/0 with simple interrupted pattern. The skin sutures were also removed on the 10th post-operative day. At the end of surgery, serum therapy with sugar-salt dextrose 5% NaCl 0.9% solution was performed and a course of antibiotics consisting of penicillin (Nasr Pharmaceutical Co., Iran) and streptomycin (Jaber Ebne Hayyan, Iran) was administered *i/m* for a period of five days. Lactulose was used to deal with constipation and feeding the animal with soft food was conducted.

2.2. Study area

Mazandaran province (36°33'56" N, 53°03'32" E) is located in

the northern part of Iran and on the southern coast of the Caspian Sea. Amol city is located in the eastern part of Mazandaran province. This province has a particular geographical condition with moderate and subtropical climate, 70%-100% relative humidity, 10-35 °C average temperature and 800-1200 mm annual rainfall. This province is geographically divided into the coastal plains and the mountainous areas of Alborz mountains range (Figure 4)[5].



Figure 4. Map of Iran, the highlighting position of Amol City in Mazandaran province.

3. Discussion

When some unknown occult factors come into action during the fetal development, the corresponding organs or tissues are found defective making the individual freakish in nature. Some deformities are amenable to surgical intervention and some are incorrigible in nature. Agenesis of vagina, urethra, anus and rectum are found rarely and are ascribed to flaws lying in chromatin material[4,6]. In this study, colonobladder fistula is a rare defect in lamb. Atresia ani has been reported to be a heritable condition in pigs and calves[3]. Based on this, all treated animals were not considered suitable for breeding and they were slaughtered at six months old. A genetic basis has been documented in some cases of atresia ani, but the specific cause in sporadic cases in domestic species and humans is not always known[2]. But in this anomaly, because there was no detailed information on the pregnancy or the fetal development of the lamb, the cause could not be determined. Atresia ani is a fatal affection to the male unless the surgical intervention occurs to provide a new anal stoma. In some females, fecal pressure results in rectum break, but a rectovaginal fistula is formed through vagina; and defecation can be dispelled via vulva, therefore affected female does not require a further care or surgical correction, and may not be identified[7]. In the present study, colonobladder and atresia ani occurred in a male lamb and surgery was the only treatment of these disorders in males. Four major types (I, II, IIIa, IIIb and IV) of intestinal atresia involving different intestinal segments have been described[3].

Animal presented in this study suffered from atresia ani and colonobladder fistula. Rectal surgery is best studied in small animals. However, techniques can be generalized to large animals with a few modifications and another author reported that the surgical treatment should be performed before the enlargement of the colon and urinary tract infections[8,9]. In this case, due to the lack of breeder's timely treatment for the animal, the size of colon was large. Incontinence in feces excretion is a common problem after surgery that may be short term, intermittent, permanent or be a congenital impairment in the external sphincter muscle of anus[3]. Another author reported that after surgery, to recover the proper function of the intestine, drugs can be used such as cisapride for increase of colon movements and lactulose to deal with constipation[7]. Also, in this case, lactulose was used to deal with constipation and feeding the animal with soft food was conducted. It could be concluded that surgery is the only treatment for atresia ani and colonobladder fistula in lambs. It is recommended in ruminants as it can save the life of animals, improve body weight gain and reduce herd economical loss. The operation proved to be painless and economical. In addition, the future breeding of surgically treated animals should be discouraged. For prevention, following the breeding principles and not using any poison and mutagenic drugs during pregnancy can also be effective in preventing these disorders. To prevent the transmission of such traits to the next generation of animals, these abnormalities can be deleted from the flock after the discover of the effective genes causing these disorders.

Conflict of interest statement

We declare that we have no conflict of interest.

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