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Atresia Coli in a HF Calf Diagnosed By a Barium Sulphate Enema Contrast Radiograph: A Case Report

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***Abstract*—**A fourteen day-old HF calf was presented with a history of abdominal distension and absence of defecation. Dilated loops of the small intestine and hypoplasia of the colon and rectum was observed upon a contrast radiographic examination. At necropsy atresia coli with undeveloped rectum and patent anal opening was found. We conclude that a contrast radiograph is useful for diagnosing atresia coli in such cases.

***Keywords*—** Atresia coli; contrasts radiography; enema; calf.

I. INTRODUCTION

The gastrointestinal tract develops during embryonic life from a ventrally located tube made of endoderm and surrounded by splanchnic mesoderm.This tube is differentiated into the pharynx, foregut and hindgut by the end of embryonic life (Constable et al. 1997). Atresia coli is a lethal congenital abnormality in calves and other animals (Syed and Shanks, 1992). This condition is caused by an incomplete digestive tract, due to part of the colon being missing (Brenner and Orgad 2003). Definitive diagnosis of intestinal atresia, especially those in more proximal locations like colon or small intestine atresia, requires further diagnostic steps such as radiography, ultrasonography and exploratory celiotomy. Radiography has been used as the sole diagnostic method for cases of atresia coli in calves (Azizi et al. 2010). Our report describes the contrast radiographic finding of a congenital abnormality in the colon and rectum of a HF calf.

II. CASE HISTORY AND OBSERVATIONS

A fourteen day-old HF calf was presented to the Dept. of Surgery & Radiology, College of Veterinary Science, Tirupati with a history of absence of defecation and abdominal distension. Clinical examination revealed normal physiological parameters with presence of anal opening. The owner had given the calf a cathartic a few days previous to its entry into the clinic, but reported negative results. The calf's visible mucous membranes were "muddy," which was evidence of a possible toxemia, but otherwise it appeared to be in fair condition. The calf was given an enema when first admitted to the clinic, the tube being introduced about 30 inches into the rectum and colon. One-half gallon of warm water was allowed to gravitate into the colon. This was retained for some time by the calf so pressure was applied to the abdomen and the water forced out, washing out a white mucous plug about 18 inches long, but no fecal material.. Based on the history and clinical examination, atresia coli was suspected. We are decided to take a contrast radiograph. For the contrast radiograph, barium sulphate was injected through rectal enema. After injection of only 50 ml, barium backflow through the anus was observed. The contrast radiograph revealed the presence of stenosis at the junction between the colon and the rectum and barium sulphate which was passed through a narrow canal but was then blocked (Figure 1). The next day the calf was unable to stand. No hope was held for its recovery, so the clinicians decided to submit the calf for post-mortem examination. The calf was euthanised and the necropsy revealed the presence of a small undeveloped rectum. The colon appeared as a narrow tube-like structure, its blind sac terminated 65 cm from the ileocaecal fold, and small barium particles were observed at this blind end. No other anomalies were found in other organs.

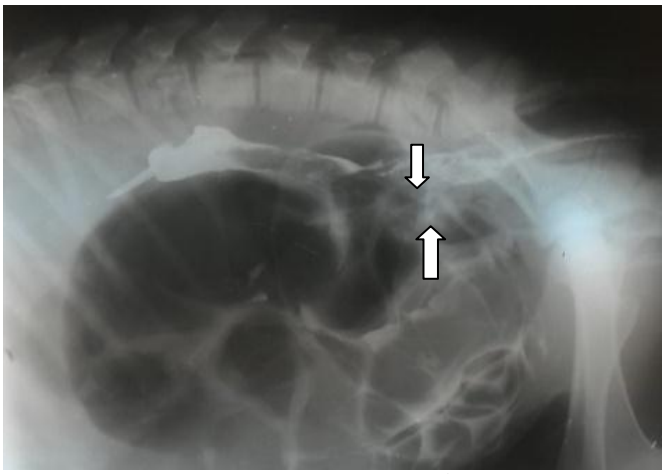

Fig. 1. Contrast radiograph revealing presence of stenosis at the colon.

III. DISCUSSION

The history and clinical signs of abdominal distension, decreased appetite, progressive depression and failure of passing meconium are an indication of gastrointestinal obstruction (Abouelnasr et al., 2012). However, observation of these signs in calves less than eight days old, mainly suggests the intestinal atresia. In the present case, the presence of a patent anal opening and the absence of meconium in the rectum suggested a proximal location of the intestinal atresia either in the small intestine or colon which necessitated the use of diagnostic imaging to detect the site of obstruction. However, the exact site of obstruction could be determined by

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contrast radiography that revealed stenosis of the rectum and blocking of barium sulphate at the blind end of the colon.

Colonic atresia in calves is usually associated with atresia ani and other coexisting anomalies such as lack of tail, kidney agenesis, umbilical hernia, cryptorchidism and spinal dysraphia (Syed and Shanks loc cit). The presence of colonic atresia and narrowing of the rectum on post-mortem examination with patent anal opening and without any other anomalies, as reported here, are considered uncommon findings for intestinal atresia. Vascular insufficiency of the developing spiral colon due to a faster growth rate and greater size of the colon was mentioned as a proposed cause of atresia coli in calves (Constable et al., loc cit). In addition, pregnancy diagnosis by palpating the amniotic sac during the period of principal organogenesis between 36 and 42 days of gestation is another possible cause, due to interruption of the mesenteric blood supply during manipulation (Brenner and Orgad loc cit). Genetic factors are another common cause of intestinal atresia associated with multiple congenital malformations (Smolec et al., 2010). The hypothesis of ischaemia and early pregnancy diagnosis is the most likely theory for explaining the pathogenesis of intestinal atresia in our case as it was not associated with other congenital anomalies.

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