Congenital Esophagotracheal Fistula as the Cause of Bloat in a Calf

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Summary
A four day old Holstein calf was presented with a history of recurrent free gas bloat. An exploratory laparotomy was performed and no abnormalities were discovered in the gastrointestinal tract. An esophagotracheal fistula was suspected and confirmed by endoscopy. Surgical correction was performed by ligating the tubular connection between the trachea and esophagus and suturing closed the defects in these structures.

History and Clinical Signs
A four day old Holstein calf was referred to the Ontario Veterinary College with a history of intermittent abdominal distention first evident at six hours of life. The distention, caused by an accumulation of free gas, was easily expelled via a stomach tube. Decompression was repeated on several occasions over the following three days without difficulty. Concurrent with the above problem, it was reported that the calf had not sucked well since birth.

On presentation, (Day 1), the calf had marked, bilateral abdominal distention which was easily relieved with the passage of a stomach tube. General physical examination revealed a large umbilical swelling which was painful on palpation but had no associated heat. The animal was moderately dehydrated and hypoproteinemic with a plasma protein of 52 g/L.

Within 30 minutes of decompression the calf was again distended with gas and required deflation.

Diagnosis and Treatment
The calf was rehydrated intravenously with 3 L of balanced sterilized electrolyte solution. A diagnostic exploratory laparotomy was then undertaken to investigate both the gastrointestinal problem and the umbilical lesion.

Following face mask induction with halothane, anesthesia was maintained via endotracheal intubation. A ventral midline incision circumscribing the umbilical swelling revealed a patent and infected urachus. The umbilical vein and both arteries were isolated and ligated. The urachus was transected at the level of the bladder and the bladder sutured with 00 vicryl.

Further exploration of the abdominal cavity revealed a gas filled abomasum to be the apparent cause of the abdominal distention. Following decompression of the abomasum with a 20 gauge 3.3 mm long needle, further investigation did not reveal any other abnormality. Because the abomasum began to refill with gas as positive pressure ventilation was carried out by the anesthetist, an esophagotracheal fistula was suspected. By endoscopy a fistula was found approximately 20 cm caudal to the larynx. (Figure 1). The abdominal incision was closed, and a 11 mm diameter nasogastric tube was placed down the left nostril with the end sutured to the side of the animal's head.

Recovery from anesthesia was uneventful and the calf was treated with trimethoprim-sulfa at a dose of 16 mg/kg intravenously twice a day. The calf's total protein had decreased from 52 g/L to 37 g/L subsequent to rehydration and surgery. This deficit was corrected by the intravenous administration of 1.5 L of fresh bovine plasma.

On day 2, after intravenous administration of 1.5 L of whole blood, surgery was performed for correction of the esophagotracheal fistula. The calf was anesthetized with halothane and placed in dorsal recumbency. A ventral midline incision was made from the level of the larynx to the thoracic inlet. The sternohyoid and sternothyroid muscles were separated to expose the ventral aspect of the

1 Electrolytes, Austin Laboratories (Canada) Ltd., Guelph, Ontario.
2 Ethicon coated vicryl, Ethicon Sutures Ltd., Peterborough, Ontario.
3 Trivetrin, Burroughs Wellcome Inc., Kirkland, Quebec.
On day 6 tracheal and lung sounds were normal and as there was no drainage from the surgery site the Penrose drain was removed. The calf developed an unexplained fever at this time which did not respond to chloramphenicol at a dose of 20 mg/kg intravenously twice daily but which did respond to gentamicin at a dose of 5 mg/kg intramuscularly twice daily.

The calf was normal at the time of discharge (day 16) and was reported to be doing well at home, two months after the initial diagnosis.

Discussion

In the veterinary literature esophagotracheal fistulas have been reported in the feline (3), the bovine (1,2), the canine (3,4) and the equine (5) species.

In man, acquired fistulas occur more commonly than congenital fistulas and are often associated with one of the following: malignant, infectious or traumatic esophageal problems, infectious or malignant lung disease or periesophageal lymphadenopathy (6). The clinical picture in man is best described by a triad of signs and symp-

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5Gentocin, Schering Canada Inc., Pointe Claire, Quebec.
toms which includes (a) paroxysms of coughing precipitated by feeding, (b) gaseous distention of the gastrointestinal tract and (c) pneumonia (7).

Clinically this calf had no evidence of pneumonia prior to surgery and there was no history of paroxysms of coughing associated with feeding. However, this animal had severe and recurrent abdominal distention which resulted from the passage of air, via the fistula, from the trachea into the esophagus.

The report by van der Gaag et al (2) is on a nine month old calf that had also been affected with bloat at birth. The calf had had difficulty in drinking as a young animal but had not shown any clinical signs during the grazing period. It was not until the animal had been housed at an age of nine months that recurring bloat resulted from inflation of the rumen via the fistula.

Although the cervical approach at surgery is relatively straight-forward, difficulties may arise in identifying the fistula if it is very small. Postoperatively, paralysis of the recurrent laryngeal nerve may occur because of its close approximation to the trachea and its susceptibility to trauma during surgery.

Although esophagotracheal fistulas are a rare occurrence they must be considered as a possible cause of acute abdominal distention in the young bovine.

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References


BOOK REVIEW


This book is the proceedings of a course organized by the National Institute for Research in Dairying for the British Cattle Veterinary Association in September 1980, and is published jointly by the National Institute for Research in Dairying and the Hannah Research Institute Ayr. The aim of this continuing education course was to summarize the principle management factors that influence mastitis and the development of practical recommendations to improve mastitis control. The book is a series of technical bulletins written for the dairy practitioner, those engaged in dairy farming and dairy processing, members of dairy farm advisory services and students.

The book is presented in five sections: 1) Introduction — The principles underlying a sound mastitis control system based on teat disinfection and dry cow therapy is presented. 2) Hygiene and Etiology — A control program must be effective against the various types of mastitis and to set up the program an understanding of the etiology and hygiene factors related to each type is essential. This material is very well covered in this section. 3) Antibiotic Therapy — The appropriate use of antibiotic therapy to eliminate infections in mastitis control and the therapy for peracute and acute mastitis is discussed. 4) Machine Milking and Cattle Housing — This section covers the methods of milking and housing which are very important factors related to the level of herd infection. The ways that milking machine design, use and cleaning can reduce this level are presented. 5) The Practitioner and Veterinary Services — The last section stresses the need for practitioners to expand their role from treating acute mastitis cases and supplying antibiotics to include supplying advice on management methods and the use of advisory services in the development of effective total control programs.

The book meets its objectives very well and material is well written and easily understood. Each paper finishes with clear, concise summary followed by references. There is very good use of tables and figures and the pictures on teat lesions are excellent.

The book, as expected, is directed to a United Kingdom audience but most of the information has world-wide application.

The section on machine milking and housing will be greatly appreciated by dairy practitioners as this information is not readily available elsewhere.

The only criticism I have of this book is the binding, which after minimal use is breaking down. I believe increasing the cost of the book, which is modest, and improving the binding is indicated.

This book is an outstanding example of applying basic knowledge of mastitis control to practical milk production and is a must for those interested in mastitis control and herd management. K.R. Armstrong.