Esophageal foreign body in a 2-day-old calf

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Abstract — A 2-day-old male Charolais crossbred calf presented with a section of an esophageal feeding tube partially obstructing his esophagus. External palpation of the neck confirmed the location of the obstruction to be within the cervical esophagus. A rumenotomy was performed and the foreign body was successfully removed.

Résumé — Corps étranger œsophagien chez un veau âgé de 2 jours. Un veau mâle de race Charolais croisée âgé de 2 jours est présenté avec une section de sonde gastrique œsophagienne obstruant partiellement son œsophage. Une palpation externe du cou confirme l’emplacement de l’obstruction comme étant à l’intérieur de l’œsophage cervical. Une ruménotomie a été réalisée et le corps étranger a été enlevé avec succès.

On June 15 2009, Victoria Veterinary Services (Lindsay, Ontario) was called to the care of a 2-day-old male Charolais crossbred calf. Approximately 2 h prior to the call the client had been feeding the calf with an esophageal tube feeder when the plastic feeding tube broke. The distal half of the feeding tube could be palpated in the calf’s esophagus at the time of presentation.

Case description

On presentation, the calf was bright, alert, and responsive with a 3/5 body condition score. During the physical examination the calf had a temperature of 38.4°C, a heart rate of 120 beats per min, but his respiratory rate could not be assessed due to vocalization. Historically, the calf had not been nursing satisfactorily, which prompted supplemental feedings using an esophageal feeding tube. On palpation of the calf’s neck, the segment of tube could be identified occupying the caudal 2/3 of the cervical esophagus. Attempted passage of a stomach tube further confirmed the location of the esophageal obstruction.

Due to the risk of esophageal trauma, it was decided that retrograde extraction of the foreign body was contra-indicated. Endoscopy was not available, and therefore an exploratory laparotomy was elected as the course of treatment. The calf was premedicated with diazepam (Diazepam injection; Sandoz Canada, Boucherville, Quebec), 0.2 mg/kg body weight (BW); butorphanol (Torbugesic; Fort Dodge Animal Health, Fort Dodge, Iowa, USA), 0.1 mg/kg BW; and ketoprofen (Anafen; Merial Canada, Baie d’Urfé, Quebec), 1.1 mg/kg BW. Once the calf was sedated, it was possible to gently massage the feeding tube several centimeters aborally along the esophagus. Surgical preparation of the abdomen was carried out with the calf in dorsal recumbency. An inverted L block was administered using lidocaine (Lidocaine neat; Fort Dodge Animal Health) to provide local anesthesia to the surgical incision site.

A laparotomy was performed through a left paramedian incision extending approximately 15 cm in length through the mid-abdomen. This approach was selected based on the animal’s age, rumen size, and because he could be easily positioned in dorsal recumbency following sedation. The abdominal viscera were only briefly explored as the rounded end of the esophageal feeding tube could readily be identified within the rumen. A 2-cm rumenotomy incision was made and the segment of tube feeder was extracted. The rumen was closed using a Cushing pattern, followed by an overlying Lembert pattern using 2-0 Monocryl (Ethicon, Somerville, New Jersey, USA). Abdominal closure was completed in 3 layers: peritoneum and internal rectus sheath, rectus abdominis, and external rectus sheath; each with a simple continuous pattern using 0 PDS (Ethicon). The skin was closed with a Ford interlocking pattern using Vetafil (S. Jackson, Washington, DC, USA). Upon recovery, 450 mL of Lactated Ringer’s Solution (Lactated Ringer’s injection; Baxter, Mississauga, Ontario) was administered intravenously for hemodynamic support. In addition, trimethoprim/sulfadoxine (Trivetrin; Schering-Plough Animal Health, Pointe Claire, Quebec), 16 mg/kg BW was administered intramuscularly.

Discussion

Esophageal obstruction, or choke, is a common occurrence in cattle, and is attributable to their feeding habits (1). Obstructions are often caused by ingestion of foreign objects.
or feedstuff, administration of medicated boluses, trichobezoars, or esophageal granulomas (1–4). In young calves, esophageal disorders may also be due to congenital megaesophagus or esophagotracheal fistula (5,6). Animals with complete esophageal obstructions are anxious on initial presentation (1,3,4). They may stand with an extended neck, swinging it from side-to-side while attempting to swallow (1). Many experience pyralorhea and may be in respiratory distress (1,3,4). In calves, regurgitation of milk may be observed following nursing (1,3).

Fatality associated with complete esophageal obstruction in adult ruminants results from the inability of fermentative gases to escape the rumenoreticulum (1). In some instances, signs attributable to ruminal tympany, respiratory distress, and metabolic acidosis, can be severe enough that they mask the primary underlying esophageal disturbance (1).

Ruminants experiencing an incomplete esophageal obstruction show signs of repeated ruminal tympany, which resolves temporarily upon passage of a stomach tube (1). They may also exhibit dysphagia and anorexia (1). In such cases, it must be determined whether the dysphagia is due to pharyngeal lesions or congenital esophageal lesions (1,2). While less likely in young calves, other disorders which resemble esophageal obstruction in mature ruminants include rabies, botulism, tetanus, and milkweed (Asclepias spp.) or sneezeweed (Helenium autumnale) toxicity (1).

Esophageal obstructions commonly occur at the cranial aspect of the cervical esophagus, at the thoracic inlet or at the base of the heart (7). External palpation may be used to confirm those located in the cervical esophagus (2,7). Additional diagnostics may help to determine the location of an obstruction; these include: manual oral examination, passing a stomach tube, esophageal endoscopy, as well as radiography of the cervical and thoracic esophagus (1–4). Double contrast radiography, with barium (sterile sodium iodine contrast if esophageal perforation is suspected) and air, helps to better identify the location and nature of the foreign body as well as mucosal folds and esophageal distensibility (2,8). Concurrent work-up may include a complete blood (cell) count, serum biochemistry panel, and electrolytes as well as venous blood gas in order to infer the degree of dehydration, acid-base disturbance and inflammatory response (1).

Various medical treatments have been described for the management of esophageal foreign bodies in ruminants. The objective is either to advance the object aborally so that it passes into the rumen, or to manipulate the foreign body so that it can be extracted orally. However, ruminal tympany — or abomasal tympany in young calves — must be addressed prior to attempting removal of the foreign body. This is often achieved through ruminal trocharization in animals experiencing complete esophageal obstruction, or by passing a stomach tube in those experiencing a partial obstruction (1,2). Administration of a regional local anesthetic works by diminishing esophageal muscle spasm and thus facilitates external esophageal massage and removal of the foreign body (4,9). Instruments such as a Thygesen’s Probang extractor may help dislodge feedstuffs from the esophagus; however, there is increased risk of lacerating the esophageal mucosa (7,9). Alternately, an inflated endotracheal tube passed into the esophagus may be used to administer hydropulsion and lavage in an attempt to relieve the obstruction (9). If the equipment is available, endoscopic removal of an esophageal foreign body may also be employed (2).

Surgical treatment of an esophageal obstruction is warranted if the animal is economically valuable and if medical treatment fails. In adult ruminants, a rumenotomy is the recommended approach to a foreign body located at the cardia (distal thoracic esophagus) (2,8,9). An esophagotomy is indicated if the object is embedded within the cervical esophagus (3,9). However, the risk of post-operative complications associated with an esophagotomy — incisional dehiscence and fistula formation — must be considered if pursuing this course of treatment (10).

In this case, a rumenotomy was selected as the course of treatment because endoscopy was not available. Surgery was pursued immediately in order to minimize further complications associated with esophageal obstruction, such as anorexia, cellulitis, and abomasal tympany. Following sedation it was possible to massage the section of feeding tube aborally and thus facilitate its removal through a rumenotomy. Performing a left paramedian laparotomy, with the calf in dorsal recumbency, was appropriate for the patient’s signalment as well as for maximizing surgical visibility. In addition, the risk of recumbency during a standing surgical procedure was avoided (11).

The prognosis is good for animals suffering from esophageal obstruction if they are treated within 2 to 12 h from the onset of clinical signs (1,7). Prognosis worsens for those animals that are not identified within 24 to 48 h from the time of obstruction. This is attributable to secondary ruminal tympany as well as to inflammation and necrosis of the esophageal mucosa. Subsequent complications may include stricture formation, cellulitis, esophageal diverticulum, and anorexia with failure to gain weight (1,2,7). Whether treated medically or surgically, appropriate aftercare for affected ruminants includes broad-spectrum antibiotics, anti-inflammatory medication, intravenous fluid therapy, and softened feed (1).

Esophageal obstruction is a common occurrence in ruminants (9). In this case, a rumenotomy proved to be an effective treatment that was appropriate for the nature and location of the foreign body as well as for the patient’s signalment. Two days following surgery the client reported that the calf was ambulatory and nursing. At the time of writing the client could not be contacted; therefore, long-term outcome for this patient remains unknown.

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References