

Medical and surgical treatment of bloat in feedlot cattle

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Abstract

Feedlot cattle can be affected by either free-gas or frothy bloat. The etiology of these 2 disease processes is distinctly different, but both can result in death by asphyxiation if not identified and managed appropriately. Initially, medical management of bloat is recommended. However, if the condition persists over multiple days or occurrences, surgical management of the condition may be warranted.

Key words: feedlot, bloat, bloat surgery

Introduction

Bloat, or ruminal tympany, can be a fatal disease in feedlot cattle if not identified quickly and managed appropriately. Both forms of bloat (free-gas and frothy) result from an inhibition of eructation.¹ Under normal conditions, eructation occurs as ruminal gas pressure increases and ruminal motility results in a movement of free gas to the esophageal opening, where receptors in the rumen wall sense the gas and initiate a complex series of muscular relaxations and contractions. As the esophagus relaxes, the animal takes a deep breath, drawing the gas up the esophagus. Much of the gas then moves from the esophagus and into the lungs, where it is exhaled during the next breath. This process is very efficient at expelling large volumes of gas and normally occurs about once every minute.

Free-gas and frothy bloat occur by distinctly different mechanisms.² Free-gas bloat is most commonly attributed to an impairment of rumen motility and/or eructation. This impairment may result from cases of severe chronic pneumonia or hardware disease that inhibit the animal's ability to eructate. Rapid onset acidosis or hypocalcemia may also decrease, or inhibit, rumen motility. Free-gas bloat may also result from thoracic/abdominal inflammation, which distorts the esophagus and/or alters the sensory function of the ruminal wall. Lastly, free-gas bloat can result from a physical obstruction of the esophagus by incompletely processed or chewed feeds such as potatoes, sugar beets or turnips. Frothy bloat is the result of a different mechanism in which the excessive production of bacterial mucopolysaccharides (slime) increase the surface tension of fluid in the rumen, and the gas becomes trapped in an emulsion of very small bubbles, which can not be eructated. In both cases of free-gas and frothy bloat, as gas continues to accumulate, the increasingly larger rumen puts pressure on the diaphragm and lungs, which impairs cardiopulmonary capacity, and will ultimately lead to death if not treated.

Bloat management

The objective of treatment is to expel the gas and relieve the pressure on the diaphragm and lungs. For bloat cases displaying severe respiratory distress, emergency trocarization may be warranted. However, conservative medical management is successful in resolving most cases. Following mechanical restraint,

a stomach tube is passed. For cases of free-gas bloat, the gas is expelled through the tube, and relief is nearly immediate. In both cases of free-gas and frothy bloat, and antifoaming product (mineral oil or poloxalene) should be administered via the stomach tube. Cases should be monitored for 2-3 days, and therapy repeated if bloat recurs. However, in cases of recurrent free-gas bloat, a rumen fistulation surgery may be required.

A rumen fistulation surgery³ commences with clipping an approximately 10 x 10-inch square, centered within the left paralumbar fossa. The placement of the fistula should be 2 to 4 inches caudal to the last rib, and 2 to 4 inches ventral to the transverse processes. For surgical preparation, adequate contact time is an essential component. One rough scrub with iodine is done to remove all organic matter and clean the site, which is followed by a second scrub. Next, local anesthesia is achieved utilizing lidocaine with 2% epinephrine, applied in an inverse "L" pattern cranially and dorsally to the surgical site. A third scrub is performed, but the suds are not rinsed away. While allowing for adequate contact time, the surgery pack can be prepared. Finally, the iodine can be rinsed from the surgical site with isopropyl alcohol.

In the center of the clipped area, a circular hole is cut through the skin approximately 2 inches in diameter. Blunt dissection is then utilized to separate the external abdominal obliques, the internal abdominal obliques, and then the transversus abdominis along their muscle plains through the center of the skin incision. Blunt dissection is preferred over incising the muscle layers, as there is less hemorrhage and leaving the muscles intact will serve as a quasi-sphincter to reduce rumen content seepage when the calf is not bloated. The final layer is the peritoneum, which is incised with care taken to not puncture the rumen. The rumen is now grasped with a Backhaus towel clamp, and a second clamp is placed over the top of the first to provide redundancy in case of ruminal wall tearing. Utilizing the towel clamps as a handle, the rumen wall can now be pulled through the body wall incision to facilitate the placement of stay sutures. Stay sutures, with a non-absorbable suture, can be placed in a horizontal mattress pattern at 12-, 3-, 6-, and 9-o'clock, approximately ½-inch from the skin edge. Once stay sutures are complete, the rumen can be incised in a circular pattern around the tissue being held by the towel clamps. Lastly, the rumen is everted, and the cut edge of the rumen wall can be attached to the edge of the skin utilizing either a simple continuous or simple interrupted pattern.

In most cases, little case follow up is required. It is recommended that animals be retained in a hospital pen for daily observation for a few days following surgery, but can be returned to their home pens 3 to 5 days following surgery. The fistula typically begins to close 30 to 60 days following surgery, and the animal will retain a small stellate scar in the skin and an adhesion between the rumen and the body wall. Most animals will finish the feedling period and be harvested with no additional concerns.

Discussion

In summary, both free-gas and frothy bloat in cattle can be fatal disease processes if not identified and managed appropriately. Conservative medical management resolves most cases of bloat when identified early in the disease process. Animals in which bloat recurs multiple times following medical management are candidates for a ruminal fistulation surgery, which is a relatively simple procedure and will take less than 30 minutes for the skilled practitioner.

References

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