Disorders of Rumen Distension and Dysmotility

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KEYWORDS

• Vagal indigestion • Rumen motility • Abdominal distension

KEY POINTS

- Rumen distension and hypomotility are common clinical signs that are found together.
- The location of abdominal distension and consistency of rumen contents provide key information for determining the cause of abdominal distension.
- Serum chloride and bicarbonate concentrations and rumen chloride concentration allow for differentiation of type 2 and type 3 vagal indigestion.
- Rumenotomy or right flank exploratory surgery can be both diagnostic and therapeutic.

INTRODUCTION

Rumen distension and dysmotility are not uncommon presentations in both cattle and small ruminants. These clinical signs often are linked, as dysmotility can lead to rumen distension and distension can lead to dysmotility. Identifying the underlying cause of the distension and dysmotility and determining if it is truly of gastrointestinal origin is critical to appropriate treatment. Generally, a thorough physical examination combined with some routine diagnostics can accurately identify the reason for rumen dysfunction, and guide appropriate treatment and prognosis.

NORMAL RUMEN CONTOUR AND MOTILITY

Examination of rumen shape, fill, and motility should be a part of the physical examination on all ruminants. Assessment of abdominal shape and rumen fill provides crucial information on feed intake and potential causes of distension. Decreased rumen motility can be a sensitive indicator of disease, although not specific, as many inflammatory processes and increased sympathetic tone will decrease normal rumen motility.[1]

Abdominal and Rumen Contour

Assessment of abdominal shape is preferably done early in a physical examination while observing a cow from a distance. While standing directly behind the cow,

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determine if the cow's abdomen appears gaunt, normal, or distended.[2] Abdominal shape is not entirely dictated by rumen shape, but rumen size is the most common reason for abnormal distension.[3] Abnormalities identified at this time can be useful in guiding a more thorough examination of the forestomach during the remainder of the physical examination. Nonetheless, practitioners must remember that other conditions, including intestinal distension, peritoneal effusion, pathologic accumulation of uterine fluid, and rupture of the prepubic tendon can affect abdominal shape and must be considered.

In a normal cow or small ruminant, the abdomen should be slightly wider than the stifles bilaterally. Typically, it will be somewhat symmetric, although slight differences from right to left are not uncommon. The most prominent distension on the left in a normal cow is typically around the level of the stifle in the mid abdomen due to fiber accumulation in the rumen. On the right, the normal shape is a slight enlargement below the stifle due to the small intestine.

The rumen should be palpated in the left paralumbar fossa and rectally. The normal rumen stratification can be identified on physical examination. There should be a gas cap in the caudodorsal rumen, a fiber mat throughout most of the rumen, and fluid ventrally. The gas cap, found dorsally, is softer and will immediately return to its previous shape when compressed. The doughy fiber mat is the most easily distinguished layer on palpation, as one can press into the rumen wall and leave an indention when it is palpated rectally. On palpation through the flank, the fiber mat simply feels firm. The fluid layer is found in the ventral left flank. This area is softer than the fiber mat, but ballottement of this area is difficult due to the weight of the rumen contents.

Normal Rumen Motility

Rumen motility should similarly be evaluated as a part of the physical examination of all ruminants. Simultaneous auscultation and palpation in the left paralumbar fossa will allow the examiner to assess the frequency and strength of rumen contractions while also hearing any abnormal sounds associated with the contraction. The normal rate is 1 to 3 contractions per 2 minutes. Each contraction should be strong enough to lift the examiner's hand on the paralumbar fossa. The sound should grow louder and then softer as the fiber mat turns inside the rumen and brushes along the rumen wall. There should not be any splashes or bubbling sounds associated with the contraction.[2] This assessment of rumen motility measures the contraction rate of the dorsal rumen sac, and does not differentiate primary versus secondary contraction, as the dorsal sac will contract with both patterns. In most cases, simply determining the overall rumen contraction rate is adequate.

Primary contractions are mixing contractions in which the fiber mat is turned in the rumen to ensure that feed material is mixed with the microbial flora contained in the rumen fluid. These contractions occur approximately 1 to 2 times per 2 minutes. Primary contractions are initiated at the reticulum with a biphasic contraction of the reticulum. These contractions can be ausculted at the seventh to eighth intercostal space, just caudal to the elbow on the left side or visualized by ultrasound caudal to the xiphoid and left of midline. The first reticular contraction is smaller, whereas the second contraction completely collapses the reticular lumen. From there, the contraction moves caudally and dorsally as the dorsal sac contracts. This is followed by contraction of the ventral sac and finally by contraction of the cranial sac to complete the cycle.[1,4] This pattern effectively mixes the fiber suspended in the mat with the liquid in the ventral aspect of the rumen, allowing the bacteria to attach to the undigested fiber. This furthers digestion and increases fermentation. Primary contractions also cause fluid outflow through the omasal canal as the reticular contractions create

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