

## ABOMASAL DISEASES IN CALVES

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*Abomasal diseases and especially abomasal displacements are the most commonly detected abdominal disorders and represent the most common reason for abominal surgery in dairy cattle.*

*Practitioners are used in diagnosis and treatment of the conditions and expect the disease in cows soon after parturition. Abomasal diseases are also described in calves. But they are not as common in this age group and not as expected. The presentation reviews the current knowledge on the pathophysiology, clinical picture, laboratory findings and treatment of abomasal diseases (abomasal tympany, abomasal displacement, abomasal volvulus and abomasal ulcers) in calves by means of 35 patients of the Clinic for Ruminants in Vienna.*

### **Abomasal displacement**

The clinical presentation of abomasal diseases seen in calves varies. The abomasum can displace without volvulus to the left or right of its normal position by swinging, folding, or stretching the lesser omentum and attached structures. In addition, dilation, without apparent displacement is also described in calves.

Abomasal volvulus is also seen in calves and seems to progress quickly if untreated.

Abomasal displacement in calves before weaning usually occurs as right displacement, whereas after weaning abomasum may displace to either side, most often to the left.

**Left abomasal displacements (LDA)** are recognized occasionally in beef as well as in dairy calves, most commonly between 6 weeks and 4 months of age, during changing the diet from milk to hay and concentrate. High amounts of starch in milk replacer, rations with high energy content and abomasal ulcers have also been reported as factors in the pathogenesis of left abomasal displacement.

Clinical signs of left displacement are less well described in calves but they are more variable than in adults. They include nonspecific signs such as reduced appetite, poor weight gain, recurrent tympany, and variable faecal consistency.

The distended abomasum typically fills the left flank in affected calves and can cause distinct asymmetry when viewed from behind or above. The ping detectable by simultaneous auscultation and percussion may be less high-pitched than in adult cattle. Sometimes the area of percussion is lower than one would expect. All these symptoms make it difficult to differentiate between ruminal distention with tympany and abomasal displacement. This may be the reason why the diagnosis is often delayed in calves.

Calves may also have concurrent diseases typical of their age group including pneumonia and diarrhea. Therefore, calves do not consistently demonstrate the hypochloremic metabolic alkalosis shown by adult ruminants with LDA.

In calves already feed dry matter (hay, concentrate) and showing rumen sounds, the multiple auscultation can help to differentiate. Auscultation in the rumen region reveals complete silence within the costal arch, in contrast to the normal rumen sounds which can still be heard in the hollow of the left flank.

Careful auscultation over several minutes will reveal a characteristic metallic, bright sound at intervals sounding as if a pipette full of fluid is emptied into a milk can half full of water.

In difficult cases rumen fluid analysis and ultrasonographic examinations can be very useful.

High amounts of clotted milk in the rumen fluid indicate to ruminal drinking causing tympany. Some aspects of medical therapy are valuable adjuncts to surgical correction of gastrointestinal disturbance in calves. The potential for rapid dehydration dictates that systemic therapy begin before laboratory results can be obtained, even in calves with mild dehydration. Isotonic saline with supplemental dextrose is generally a safe choice until laboratory analysis is available. Oral supplementation should not be used as the primary method for rehydration.

Rolling procedure is possible to relocate the abomasum, but relapses occur often. Therefore surgical treatment is preferred on our clinic in Austria. The standing procedures are not generally recommended in small calves because of their tendency to lie down midprocedure and the difficulty for the surgeon. However, larger calves may tolerate standing surgery. An omentopexy can be performed from a right flank approach in a calf in left lateral recumbency or standing; but the omentum is more fragile in calves than in cows.

A left paralumbar fossa abomasopexy is another surgical option. This can also be done in the standing or recumbent animal. If the clinician is unsure whether the left sided viscus is rumen or abomasum this is an attractive surgical option.

A right paramedian abomasopexy can be performed in calves positioned in dorsal recumbency with appropriate reduction in incision length and suture material size. Particular attention to the animal's respiratory status is important by performing this method because pneumonia is a common finding in calves. The ability to directly stabilize the abomasum is a distinct advantage of this approach. The lack of access to intestinal structures distal to the abomasum is potentially a greater concern in calves with signs of generalized intestinal distention.

The lateral position places less stress on the respiratory system, and paracostal incision provides better access to evaluate other intestinal structures. Furthermore, if the abomasum needs to be emptied, it can be accomplished better from this lateral approach.

### **Abomasal volvulus**

Calves with either a right displacement of the abomasum (RDA) or an abomasal volvulus (RVA) typically present to the herdsman with signs very similar to those described for LDAs (i.e., partial or complete anorexia, abdominal distension, and decreased fecal output with altered consistency (fluid or pasty)). However, in the case of an RVA, the progression of signs may be very rapid, and some affected calves will first present with signs of severe depression, anorexia, and dehydration.

The presence of a tympanic area centered over the 10<sup>th</sup> and 13<sup>th</sup> right ribs and on a line from elbow to tuber coxae is the primary diagnostic sign of an RDA or RVA.

This ping must be differentiated from other sources of right-sided pings, which include caecal dilation/torsion, gas accumulation in the duodenum, spiral colon, ascending colon or small intestine caused by torsion of the mesenteric root, or right flank abscess.

An abomasal ping generally can be differentiated from pings associated with other structures by combining information about ping location, size, and pitch. The caecum, colon, and small intestines are limited in their mobility by their mesenteric attachments to the dorsal body wall, whereas the abomasum and ascending duodenum are limited by more cranial attachments at the duodenal sigmoid flexure and the reticular connection to the diaphragm. Caecal, colonic and small intestinal pings will generally be centered on a point in the paralumbar fossa, more caudal than that for the abomasum or duodenum. The caecum is the only structure that has the potential to dilate to the maximum size possible for the abomasum and is the primary differential for single pitched pings greater than 10 cm in diameter.

In addition, to differentiate the ping's center by location, the outline of the caecum can usually be seen through a right paralumbar fossa with the calf in lateral recumbency.

Small intestinal pings are typically a collection of small diameter pings of varying pitch.

Spiral colon pings also tend to involve multiple areas that vary in pitch. Ultrasound evaluation may be very useful to differentiate the right sided viscus.

The presence of tachycardia (> 130) and colic have been reported to be more consistent with RVA in calves.

A right paracostal approach can be used to perform an omentopexy (preferred procedure) in calves positioned in left lateral recumbency.

A rolling procedure with percutaneous decompression (as described for LAD) has been reported to be effective in calves with right sided pings. However, this is very risky should the calf have a volvulus or involvement of another right-sided viscus.

The veterinarian should be prepared to move to an open approach within 2 to 3 hours if clinical signs do not improve or are getting worse.

A modified right flank or right paracostal omentopexy can be used to correct abomasal displacement or volvulus in calves in left lateral recumbency.

## **Abomasal ulceration**

Abomasal ulcers and erosions are an economic concern for all types of calf raising systems. Four categories of abomasal ulcers are described:

Type 1: Nonperforation ulcer: The ulcer does not perforate the abomasal wall and intraluminal haemorrhage is minimal.

Type 2: Nonperforating ulcer with severe blood loss: The ulcer does not perforate the abomasal wall, but erodes a major vessel in the submucosa, resulting in severe intraluminal haemorrhage.

Type 3: Perforating ulcer with local peritonitis: The ulcer perforates the abomasal wall and abomasal contents leak into the peritoneal cavity or omental bursa. Peritonitis is localized by fibrin deposition and the abomasum becomes adhered to the peritoneum, omentum or surrounding viscera.

Type 4: Perforating ulcer with diffuse peritonitis: The ulcer perforates the abomasal wall and abomasal contents quickly leak into and spread throughout the peritoneal cavity, resulting in diffuse peritonitis.

Animals may have ulcers that simultaneously meet the criteria for more than one of these categories. In veal calves abomasal ulcers are typically found around the pylorus. Abomasal ulcers are hard to diagnose antemortem because there are almost no typical symptoms. Affected calves can be found dead, and these are usually calves of higher quality than those in the rest of the herd. A thorough physical examination is essential because of the many differential diagnoses for abdominal pain and distention in calves. Signs include lethargy, abdominal distension with tympany, colic, bruxism, fluid distension of the abomasum, diarrhea, and death.

The haematocrit is usually low with type 2 ulcers. A faecal occult blood test may be positive with types 1 and 2. Exploratory laparotomy is the most definite way to diagnose ulcers antemortem. Most ulcers are found on the greater curvature of the fundic region or in the pyloric region. Erosions are usually located on the edges and sides of the abomasal folds.

In general, treatment is reserved for animals with bleeding ulcers or deep nonperforated ulcers. Treatment of abomasal ulcers has historically included blood transfusions, antibiotic administration, changes to the diet, and oral administration of antacid agents. Increasing the luminal pH with antacids aims to provide a more favourable healing environment for ulcers. Treatment with systemic agents such as clenbuterol and H<sub>2</sub> receptor antagonists such as cimetidine have been tested as prophylactic and therapeutic agents in calves with little beneficial effect. Surgical repair of ulcers can be performed on selected cases. Calves need to be in an operable condition and have isolated ulcers. Surgery needs to be performed early in the disease process. Calves should be positioned in left lateral recumbency for a 20 cm right paramedian or right paracostal approach. Typically, ulcers are diagnosed during a laparotomy and can be either resected or the serosa can be inverted with a mattress suture. The goal of the surgery is surgical exploration with identification of the ulcer. The ulcer may be resected and the abomasal wall has to be closed afterwards, or it may be possible to simply oversew the affected portion of the abomasal wall. Aggressive abdominal lavage and systemic fluid and antibiotic therapy are an appropriate ancillary therapy.

The right paracostal approach proved adequate access to the entire abomasum in most calves of this age and is generally preferred. The abomasum should be exteriorized and stay sutures placed cranial and caudal to the ulcer site. The surgeon should resect the ulcer site, if necessary, and the contents of the abomasum, including any hairballs, should be drained away from the incision.

The abomasal surface should be vigorously lavaged and the resection site closed with a double inverting pattern using an absorbable suture material. If the ulcer is small and focal it may be possible to simply invert it into the lumen of the abomasum and oversew it with a double inverting pattern. If a localized abscess is adjacent to the abomasum or within the omental bursa, or if a diffuse peritonitis is diagnosed, calves should be euthanized.

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## **ЗАХВОРЮВАННЯ СИЧУГА У ТЕЛЯТ**

**Резюме**

Захворювання сичуга, особливо його зміщення — найбільш поширена патологія черевної порожнини і найчастіша причина хірургічного втручання у ВРХ.

Ветеринарні лікарі переважно діагностують і лікують це захворювання у корів відразу після отелу. Захворювання сичуга зустрічається також у телят, хоча вони і не поширені у цій віковій групі. У статті подані сучасні дані про патофізіологію, клінічну картину, лабораторну діагностику та лікування захворювань сичуга (здуття, зміщення, заворот кишок і виразка) у телят на підставі 35 випадків у Віденській клініці жуйних тварин.

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## БОЛЕЗНИ СЫЧУГА У ТЕЛЯТ

### А н н о т а ц и я

Болезни сычуга, особенно его смещение — наиболее распространенная патология брюшной полости и часто причина хирургического вмешательства в КРС.

Ветеринарные врачи в основном диагностируют и лечат это заболевание у коров сразу после отела. Болезнь сычуга встречается также у телят, хотя для этой возрастной группы они не настолько характерны. В статье представлены данные о патофизиологии, клинической картине, лабораторной диагностике и лечении болезней сычуга (вздутие, смещение, заворот кишок и язва) у телят на основании 35 случаев в Венской клинике жвачных животных.

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