Abomasal impaction due to sand accumulation in two cows

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SUMMARY

Introduction - Abomasal impaction is rarely encountered in cattle and is characterized by the drying of the abomasal content and the enlargement of the abomasum as a result of the abnormal accumulation of solid matter in the organ.

Aim - This manuscript aims at reporting the occurrence of the rarely encountered abomasal impaction in Turkey.

Materials and methods - Two five-year-old dairy cows presenting with symptoms of inappetence, lethargy and constipation constituted the material of the study. Based on the clinical symptoms and necropsy findings, the animals were diagnosed with abomasal impaction.

Result and discussion - The body temperature, heart rate and respiratory frequency of the animals, which were slightly dehydrated, were within the normal ranges. Abdominal auscultation revealed reduced rumen contractions and bowel sounds were not heard. On palpation of the right abdominal wall, a large and hard mass was detected, while percussion was associated with a moaning sound. Post-mortem examination revealed the presence of a blood-tinged, dry abomasal content of hard consistency, composed of roughage and foreign substances, including soil, sand and gravel.

Conclusion - In animals given feed and water containing mud or sand, sand may accumulate in the abomasum and lead to fatal impaction cases, resulting in significant economic losses. Animals displaying signs of chronic weight loss, ruminal tympany and constipation are recommended to be evaluated for abomasal impaction.

KEY WORDS
Cow, sand, abomasum, impaction.

INTRODUCTION

Abomasal impaction is characterized by the drying of the abomasal content and the enlargement of the abomasum as a result of the abnormal accumulation of solid matter in the organ¹⁻⁳. The aetiology of this disorder, observed particularly in cattle with reduced water intake during the winter season and fed on rations rich in low-quality roughage⁴⁻⁶, is associated with traumatic reticuloperitonitis ⁷⁻⁸, vagal indigestion¹, adhesions of the abomasum with the rumen or the ventral part of the abdominal wall, and the consumption of non-food material (sand, gravel)⁹⁻¹⁰. The long-term consumption of sand or soil-laden feed and water or the consumption of sand or soil by animals with trace element and mineral deficiency both lead to the accumulation of sand in the abomasum⁴⁻⁶,¹⁰. These animals present with signs of inappetence, body weight loss, decreased milk yield, reduced rumen contractions, tympany, discharge of sandy faeces or constipation, lethargy, recumbency, and death within several weeks⁶⁻¹¹⁻¹³. The accumulation of a large quantity of sand-laden feed material in the abomasum causes the atony, impaction and dilatation of the organ¹¹⁻¹³. It is reported that abomasal impaction is rarely encountered in cattle¹. Although very few literature reports are available on sand accumulation in the abomasum, to the authors’ knowledge no literature report exists on such a case in Turkey. This manuscript aims at reporting the occurrence of the rarely encountered abomasal impaction in Turkey.

CASE DESCRIPTION

Two five-year-old cows, raised at a dairy farm with 200 cattle and located in the Bismil district of Diyarbakir province in Turkey, constituted the material of the study. Upon the occurrence of eight mortalities at the farm, the owner of the holding consulted the veterinary clinics of our faculty. On-site inspections at the farm revealed that the holding was constructed at the waterfront of the Tigris (Dicle) river and that the animals were provided with sand-laden bore water as drinking water.

During the examination of the herd, no sign of infectious disease was observed in the animals. The anamnesis pointed out to complaints of inappetence, lethargy, tympany and constipation in two cows. The clinical examination of these animals demonstrated slight dehydration and body temperatures, heart rates and respiratory frequencies within normal ranges (Table 1). On abdominal auscultation, it was determined that the rumen contractions were reduced and bowel...
sounds were not heard. Ballotment of the right abdominal wall revealed the presence of large and hard mass as well as abdominal distension. Regional percussion revealed a moaning sound but no ping sound was detected. Following clinical examination, it was recommended to perform exploratory laparotomy on the affected animals, but at the request of the owner, a necropsy was performed on one of the cows. Upon the excision of the abdominal cavity, it was observed that the entire forestomachs, in particular the omasum and abomasum, were extensively enlarged. The abomasal wall was thin and friable and the serosal blood vessels were congested. The presence of a bloody, dry and hard content partly composed of roughage and foreign substances, including soil, sand and gravel was observed in the lumen (Figure 1). The junction of the abomasal pylorus and duodenum was empty. The abomasal mucosa was observed to be oedematous and highly congested, and a region, 10x13 cm in size and located in the curvature major, presented with a dark grey-black mucosa that had adhered to the abomasal content. Severe necroses and haemorrhages extending beneath the serosa were present in this area. The content was also hardened in the forestomach compartments other than the abomasum. The mucosa of these compartments were of a varying intensity of dark grey-black colour and could be easily sloughed together with the content to which it was adhered. Disseminated areas of haemorrhage and ulceration existed in some regions of the forestomachs, in particular the rumen. The intestinal serosa and mucosa were hyperaemic and the intestinal lumen contained a small quantity of watery and sandy content.

Following the clinical examination and necropsy of one of the animals, the animal owner was informed that the other cow needed to be treated. However, the animal owner did not agree with the animal being treated and had the cow slaughtered.

**DISCUSSION AND CONCLUSION**

Sand impaction has been reported to occur in several animal species, including the horse, elephant and ostrich, as well as in humans. Literature reports indicate that abomasal impaction may develop in animals fed on low quality roughage containing low levels of digestible protein and energy. In cattle, abomasal impaction is caused by undigested roughage and non-food foreign substances, such as sand and gravel. Nevertheless, few bovine cases of abomasal sand impaction have been reported in the literature.

It is suggested that sand impaction may occur in the abomasum of animals, which either consume sand-laden feed and water for extended time periods or have pica. In the case presented in this study, a noteworthy finding was that the drinking water provided to the animals contained an abundant amount of sand.

Reports indicate that while animals suffering from abomasal impaction present with clinical symptoms such as inappetence and lethargy, their body temperature, heart rate and respiratory frequency remain within physiological ranges. In the present study, the animals having presented with inappetence and lethargy upon clinical examination, while their body temperature, heart rate and respiratory frequency remained within physiological ranges, was in agreement with previous literature reports.

It is known that, in animals with abomasal impaction, abdominal distension develops and rumen contractions either do not occur at all or occur at reduced numbers. In this case study, in agreement with literature reports, abdominal distension and reduction of the rumen contractions were detected.

It has been reported that the impacted abomasum is generally located in the lower right part of the abdominal wall and the deep ballotment together with the strong percussion of the region may demonstrate the presence of a hard mass and pain. The findings obtained with the palpation and the percussion of the right abdominal wall of the animals included in this case study complied with those reported in literature. Furthermore, the absence of the ping sound on abdominal percussion in this case was in agreement with the findings previously reported by researchers suggesting sand impaction of the abomasum to be characterized by an atypical ping sound.

Abomasal impaction causes the sub-acute obstruction of the upper gastrointestinal tract. Depending on the severity of the case, animals suffering from abomasal impaction display clinical symptoms varying from constipation and pain to abomasal rupture, which may eventually result in death. Sand impaction may be associated with either diarrhoea or reduced or terminated defecation. Light, moderate or severe pain may develop, depending on the severity of mucosal damage. The observation of constipation and the absence of bowel sounds in the animals included in this case study are in agreement with previous literature reports.

It is reported that, as a result of obstructed fluid flow from the abomasum to the duodenum, in cases of abomasal impaction, absorption is prevented and dehydration of varying
degrees develops\textsuperscript{6,13}. The animals included in this case study having presented with slight dehydration was in agreement with literature reports indicating the possible development of dehydration in cases of abomasal impaction\textsuperscript{1-3,12}. In cases of abomasal impaction, the content of the abomasum has a harder consistency, which leads to the atony and dilatation of the organ. This results in the delayed emptying and enlargement of the abomasum\textsuperscript{2}. In such cases, abomasal impaction and enlargement is associated with the enlargement and impaction of the omasum. The rumen is filled with either a hardened dry content or fluid and is distended. The small intestines are either completely empty or contain a very small volume of fluid\textsuperscript{1-3,12}. In a similar research on animals suffering from sand impaction, Erickson and Hendrick\textsuperscript{9} reported the presence of feed material mixed with a large amount of sand in an enlarged abomasum. Erickson and Hendrick\textsuperscript{9} also indicated sand to have accumulated in the distal jejunum and to have caused obstruction. He reported that in the obstructed part of the small intestine, the serosa was severely congested, and that the upper part of the obstructed region was markedly dilated and filled with a reddish-brown coloured fluid and presented with serosal congestion. In the present study, primarily the abomasum or duodenum of two cows. JAVMA 209: 1294-1296.


