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Clinically and Ultrasonographic Examination Findings in a Cow with Right Sided Abomasal Displacement and Traumatic Reticuloperitonitis

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ABSTRACT

In this study, the results of clinical, ultrasonographic, and laparotomy examinations of a five-year-old dairy cow with right abomasal displacement and traumatic reticuloperitonitis are presented. A five-year-old Holstein cow who had recently given birth was brought to the veterinary teaching hospital with a history of depression, anorexia, constipation, arched backs, and bloat. A possible diagnosis of TRP and RDA was made based on the history and the findings of the clinical and ultrasonographic finding, and the cow was sent for surgery. An ultrasonographic examination revealed hyperechogenic fibrin deposits and anechogenic fluid pockets between the reticulum and the anterior dorsal blind sac of the rumen. It was discovered that the displaced abomasum is hypoechogenic, has fluid ingesta ventrally, and has a gas cap more dorsally. The reticulum's submerged and free foreign bodies were removed, and an abomasopexy procedure was performed. The day after the operation, the cow was able to eat and she gradually got better over the next few days. It was concluded that ultrasonography along with a clinical examination, is a useful adjunct tool for assessing the concurrent observed abomasal displacement and traumatic reticuloperitonitis.

Keywords: Clinically Examination, Cow, Right Abomasal Displacement, Traumatic Reticuloperitonitis, Ultrasonographic Examination.

Sağ Abomazum Deplasmanı ve Travmatik Retiküloperitonitisli Bir İnekte Klinik ve Ultrasonografik Muayene Bulguları

ÖZ

Bu çalışmada, sağ abomazum deplasmanlı ve travmatik retiküloperitonitisli beş yaşlı süt sığırında klinik, ultrasonografik ve laparotomi muayene sonuçları sunulmaktadır. Yakın zamanda doğum yapmış beş yaşındaki Holstein inek, depresyon, iştahsızlık, kabızlık, sırta kamburluk ve şişkinlik anamnezi ile veteriner eğitim hastanesine getirildi. Anamnez, klinik ve ultrasonografik muayene sonuçlarına dayanarak, TRP ve RDA'nın geçici teşhisi yapıldı ve inek ameliyata alındı. Klinik muayeneyi takiben, ultrasonografik incelemede, retikulum ile rumenin ön dorsal kör kesesi arasında hiperekojenik fibrin birikintileri ve anekojenik sıvı keseleri tespit edildi. Deplase olmuş abomazumun hipoekojenik olduğu, ventralde sıvı ve daha dorsalde gaz kesesine sahip olduğu belirlendi. Retikulumun batmış ve serbest yabancı cisimleri çıkarıldı ve abomazopexi operasyonu yapıldı. Operasyondan sonraki gün ineğin iştahının açıldığı ve sonraki günlerde durumunun giderek normalleştiği bilgisi alındı. Ultrasonografinin klinik muayene ile birlikte eşzamanlı gözlenen sağ abomazum deplasmanı ve travmatik retiküloperitonitisi değerlendirmede yararlı bir yardımcı araç olduğu sonucuna varıldı.

Anahtar Kelimeler: Klinik Muayene, İnek, Sağ Abomazum Deplasmanı, Travmatik Retiküloperitonitis, Ultrason Muayenesi.

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INTRODUCTION

Abomasal displacement (AD) is an important disease of the digestive tract in cattle and is seen especially in high yielding milk breeds (Constable et al., 2017a; Nasr et al., 2014; Wittek, 2017a). The etiology of AD is thought to be caused by a number of variables. Anorexia (most frequently defined as a lack of appetite for grains with a decreased or normal appetite for roughage) and decreased milk production (typically noticeable but not as severe as with traumatic reticuloperitonitis (TRP) or other causes of peritonitis) are characteristics of AD that are common (Wittek, 2017a). Clinical symptoms of right displaced abomasi (RDA) include inappetence, depression, dramatic drops in milk production, absence of rumination, few atypical feces, right abdominal distension, pinging over the right flank, and fluid-splashing sounds on ballottement of the right flank (Constable et al., 2017a; Nasr et al., 2014). Also, temperature, heart rate, and respiratory rate are usually normal (Wittek, 2017a). Diagnosis of RDA is usually made according to clinical evaluation (ie, percussion and auscultation of a ping), and confirmed by results of laboratory testing as indicated (Braun and Feller, 2008; Constable et al., 2017a; Wittek, 2017a). Pings connected to a rumen gas cap are often more dorsal, less resonant, and extend more caudally through the right paralumbar fossa. The rotating auscultation of the displaced abomasum also produces splashing noises. Although the ultrasonographic examination may assist in confirming a diagnosis of RDA, it is unable to accurately distinguish RDA from abomasal volvulus. (Wittek, 2017a).

Traumatic reticuloperitonitis of relatively common disease in adult cattle is localized inflammation in the wall of the reticulum, usually due to perforation by a sharp object (eg, nail or wire) ingested by the animal (Ward and Ducharme, 1994; Wittek, 2022b). Anorexia, ruminal stasis, bloat, poorly digested feces, decreased milk yield, grunting, and manifestations of pain are among the most prevalent clinical manifestations in cattle with TRP (Baydar and Dabak, 2014; Constable et al., 2017b; Ward and Ducharme, 1994; Wittek, 2022b). Diagnosis of TRP is usually based on routine clinical examination, reticular foreign body and laboratory testing, ultrasonographic evaluation to identify localized peritonitis adjacent to the reticulum, and radiography to visualize metallic foreign bodies in the reticulum (Constable et al., 2017b; Ward and Ducharme, 1994; Wittek, 2022b). In this case report, we aimed to report clinically and ultrasonographic examination findings as well as its treatment in a cow concurrently observed RDA and TRP.

CASE REPORT

A five-year-old Holstein cow who had recently given birth was brought to the veterinary teaching

hospital at Firat University with a history of anorexia, depression, bloat, constipation, and arched backs. Upon clinical examination, the patient's rectal temperature, heart rate, and respiration rate were all 38.4°C, 56 beats per minute, and 12 breaths per minute, respectively. Moreover, in the clinical examination, anorexia, apathy, bruxism, grunting, tympani, and constipation were also detected. On the right, there was tympanic resonance that reached from the middle of the paralumbar fossa to the tenth rib. On auscultation and ballottement of the right abdomen wall, splashing fluid sounds were detected. A 3.5-MHz transducer probe was used to do an ultrasonographic examination of the paralumbar fossa, reticular area, and the seventh to 12th intercostal areas (Loqic Book XP, GE). Between the reticulum and the anterior dorsal blind sac of the rumen, there were found to be hyperechogenic fibrin deposits surrounded by anechogenic fluid pockets. (Figure 1).

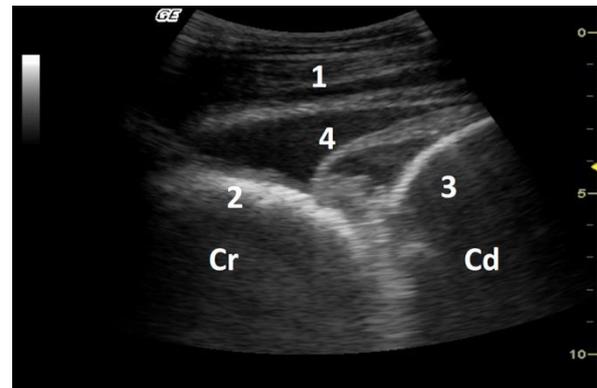


Figure 1. Ultrasonogram of severe echogenic lesions of the peritoneum interspersed with fluid imaged from the left sternal region. 1 Abdominal wall, 2 Reticulum, 3 Anterior dorsal.

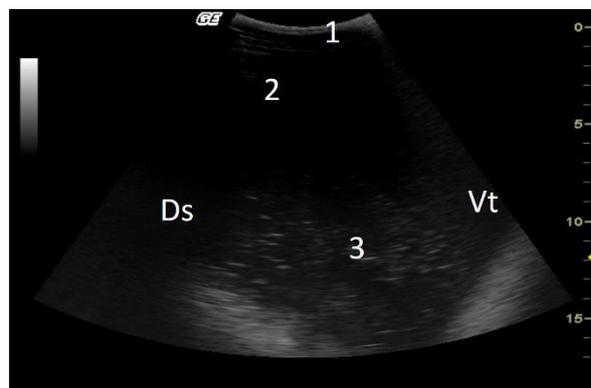


Figure 2. Displaced abomasum was determined by the ultrasonographic examination of the tenth to 12th intercostal area and the paralumbar fossa. 1 Abdominal wall, 2 Dorsal gas cap with reverberation artefacts, 3 Hypoechoic ingesta, Ds Dorsal, Vt Ventral.

The ultrasonographic examination of the paralumbar fossa and the tenth to 12th intercostal area revealed displaced abomasum (Figure. 2). Abomasum and rumen distinction is made by examining the PH of the fluid taken by puncture (liptak test) from the place where the ping sound is taken in abomasum displacements. The pH of the abomasal fluid was roughly 2, according to a percutaneous ultrasound-guided abomasocentesis that was done.



Figure 3. Evacuation of the contents of the abomasum in right sided abomasum displacement operation before abomasopexy(a). Image taken after removal of submerged and free foreign bodies from the reticulum and closure of the rumen with sutures (b).

A tentative diagnosis of TRP and RDA was made based on the history and the findings of the clinical and ultrasonographic examination, and the cow was sent to surgery. Under local infiltration anesthesia, a right and left flank laparotomy was performed on the cow while she was standing. During the exploration of the abdominal cavity, a distended abomasum was observed between the intestines and the abdominal wall in the right side (*Fig. 3a*). In palpation and exploration of the abomasum, left torsion of 180 degree was detected. The proximal part of the pylorus and duodenum entered the right cranial region of the abdomen, and it was noticed that it was twisted on the longitudinal axis of the abomasum. After evacuating gas and correcting the torsion, abomasopexy was applied. Rumenotomy was performed with routine surgical procedure. Submerged and free foreign bodies in the reticulum were removed (*Fig. 3b*). Abdominal wall was closed with the usual surgical manner. Postoperatively, penicillin-streptomycin combinations were administered for five consecutive days and fluid therapy. Abomasopexy and incision line sutures were taken 10 days after the operation. Following the operation, she started to feel appetite, and she continued to get better within the next few days.

DISCUSSION

Clinical symptoms of right abomasal displacement include right distension, ping over the right flank, and fluid-splashing sounds on the right side of the ballottement. Other symptoms include anorexia, sadness, lack of rumination, scanty abnormal feces, and lack of rumination (Nasr et al., 2014; Wittek, 2017a). The common clinical symptoms in cattle with TRP include anorexia, dehydration, reduced milk production, weight loss, ruminal stasis, bloat, arched backs, grunting, and manifestations of pain (Baydar and Dabak; Constable et al., 2017b; 2014Ward and Ducharme, 1994; Wittek, 2022b). We discovered clinical symptoms that were in line with the literature mentioned above related to cows with RDA and TRP in this study. Rectal temperature, respiration rate, and heart rate were all within normal limits in the present study. It's presumably because the clinical symptoms of TRP in cattle vary based on the condition's severity, duration, and organ involvement (Kırbas et al., 2020; Ward and Ducharme, 1994).

Ultrasonographic examination of abomasum is performed in cows at the right and left side between the 10th and the 12th intercostal spaces (Braun and Feller, 2008; Nasr et al., 2014). In healthy cows, the abomasal contents had a uniform hypoechoic appearance with echogenic stippling. While in animals with RDA, the contents were not homogenous as the ventrally located ingesta were hypochoic to echogenic with more distinct abomasal folds and the dorsal gas cap was characterized by reverberation artifact as mentioned by Braun and Feller (Braun, 2003; Braun and Feller, 2008; Braun, 2009). In the ultrasonographic examination of the abomasum, we found that the abomasum was displaced in an enlarged form. Because of the fluid ingesta ventrally and the gas cap dorsally, the abomasum's content couldn't seem uniform, and because it was hypoechoic, artifacts associated with the gas cap's reverberation could be detected more dorsally (Braun and Feller, 2008; Braun, 2009; Wittek, 2022a). In the present case report our ultrasound findings to RDA were consistent with the above information.

For the diagnosis of TRP, ultrasonography is a significant imaging tool and was originated as a diagnostic support a few decades (Braun and Götz, 1994; Braun, 2003; Constable et al., 2017b). Cattle with TRP frequently exhibit fibrinous deposits on ultrasound, which may or may not be accompanied by fluid pockets and present as echogenic structures with hypochoic inclusions affecting the reticular contour and close to organs (Braun, 2003; Braun, 2009; Constable et al., 2017b; Kurosawa et al., 1991). These lesions represent peritoneal inflammation alterations. An echogenic capsule of varied thickness with a primary anechogenic to hypoechoic cavity is the defining feature of reticular abscesses (Braun, 2003; Braun, 2009). In

accordance with the literatures, we ultrasonographically revealed that between the reticulum and the anterior dorsal blind sac of the rumen, there were found to be hyperechogenic fibrin deposits with anechogenic fluid pockets intermingled. Atony or hypotony of the abomasum appears to be the main cause of AD (Braun and Feller, 2008; Wittek, 2022a). Other factors that contribute to decreased abomasal motility include genetic predisposition, concurrent diseases like mastitis and metritis, metabolic disorders, simultaneous diseases like mastitis and metritis, alterations of intra-abdominal organs, especially in late pregnancy (Delgado-Lecaroz, 2000). In literature reviews, we could not find any other study in which RPT and RDA were seen at the same time. As mentioned above, we think that metabolic disorders, concurrent diseases, changes of intra-abdominal organs, and genetic predispositions that cause atony or hypotonia of the abomasum may be the etiological cause of RDA in this study. In addition, the enlarged fetus's pressure toward the forelimbs and abomasum in late pregnancy may trigger TRP and subsequently cause atony or hypotony due to pain or vagal indigestion in the forelimbs and abomasum (Constable et al., 2017b). Therefore, we believe that the cause of RDA and TRP detected concurrent in this case was atonia or hypotonia developing after TRP.

CONCLUSION

The results of this study have shown that ultrasonography, along with a clinical examination, is a useful adjunct tool for assessing the concurrently observed RDA and TRP.

Conflict of Interest

The authors declared that there is no conflict of interest in this study

Authors Contributions

Plan, design: EB, ASD; **Material and Methods:** EB, ASD; **Data analysis and interpretation:** EB; **Writing and corrections:** EB, ASD.

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