CASE STUDY

Ultrasound and Radiographic Imaging Diagnosis of Diaphragmatic Hernia in a Transition Cow: A Case Report

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CASE HISTORY, CLINICAL OBSERVATIONS, AND DIAGNOSIS

A four and half-year-old recently calved cross breed Jersey cow was presented with the clinical signs of anorexia, recurrent bloat, bruxism and not voided dung for the past one week. Clinical examination revealed congested mucous membrane, sunken eyeball, and severely distended lower abdomen; clinically, bloat was evident. On Auscultation of heart at 4th intercostal space, low-intensity heart sounds were heard. Rectal examination revealed scanty foul-smelling dung with blood tinge. In an attempt to relieve the bloat rumen stomach was intubated, which failed to relieve the gas. The clinical suspicion pointed to the possibility of foreign body syndrome. Hence radiography was done by keeping the animal in standing position; however it revealed no clear contour of heart, reticulum, and diaphragm; another attempt was made, wherein the animal was cast on right lateral recumbency and radiography was done at 90-100 kVp, 50-60 mAs and a focus film distance of 90-100 cm using an 800 mA X-ray machine. As we would not get any diagnostic confirmation findings in radiography, an ultrasonographic assessment was planned. Ultrasonography was done with (Esoate Mylab 1) 2.5 to 5 MHz curvy linear transducer. Ultrasound examination of the heart (Venkatesan et al., 2019) and reticulum (Braun et al., 1993) was done at the left side between 4th to 5th intercostal space of thoracic cavity using the window between 6th to 8th intercostal in the abdominal cavity. Physical examination revealed a dull and depressed animal; distended left flank, moderate dehydration, elevated rectal temperature (40°C), low-intensity heart sounds with a normal heart rate was observed. Hematology was unremarkable; smear study was negative for blood parasites.

TREATMENT AND DISCUSSION

Some studies have documented that diaphragmatic hernia occurs either in the absence or presence of reticular metallic foreign bodies causing traumatic reticulo peritonitis (Saini et al., 2001). In this case, metallic, radio-opaque foreign bodies with sand particles were observed. It indicated that piercing metallic foreign bodies may cause extensive herniation reticulum into the thoracic cavity.

Singh et al., (1980) reported that reticular diaphragmatic hernias occurred due to increased abdominal pressure associated with either late gestation or soon after calving as a consequence to increased visceral volume and weight, or due to straining during parturition. In this case, the animal had calved 15 days back, and the possible increase in its visceral volumes could have caused the reticular diaphragmatic hernia.

Diagnosing diaphragmatic hernia is not an easy task. Besides the physical examination, imaging is required. In diaphragmatic hernia cases, radiography has some inherent disadvantages. Casting a compromised patient who is in advanced pregnancy is not always acceptable by cattle owners given to the risks involved. To a certain extent, this can be overcome by applying non-invasive imaging techniques such as ultrasonography, which can be done with the animal in standing position. In this study, both the
techniques were used to overcome disadvantage, and it was found to be helpful in diagnosing the diaphragmatic hernia. Ultrasonography of heart was done at 4th to 5th intercostal space, and it showed compressed cardiac chambers with reduced intensity of pumping; the reticular wall was seen in the thoracic cavity and appeared as a straight line (Figure 1). During imaging the abdominal cavity at 6th to 8th intercostal space, reticular mucosa appeared as an undulating line with hypomotility (one motility for 5 minutes). These imaging findings supported the clinical diagnosis and confirmed the presence of diaphragmatic hernia. The findings are also in agreement with the findings of Mohindroo et al., (2007). Kumar et al., (2017) reported that ultrasonography was effective in diagnosing diaphragmatic hernia by using the cranial thoracic approach especially if there is in case extensive herniation of reticulum. This approach is better than using the caudal thoracic approach. Similar findings were also observed in the present case. The compressed cardiac silhouette in the study measured of 5 cm in diameter. Ultrasonography of reticulum under M-mode revealed decreased amplitude of biphasic reticular contraction (Fig.2). Ultrasonography of heart and lower abdomen also revealed, no evidence of pericardial effusion, as well as peritoneal effusion.

For further confirmation and to correct it, Left flank exploratory laparo rumenotomy was performed with subsequent diaphragmatic herniorrhaphy was done in this case. After five days of intensive clinical care the animal could not make a recovery and succumbed.

Fig. 1: Ultrasonography of heart at 4th & 5th intercostal space showed compressed cardiac chambers and reticular wall in the thoracic cavity appeared as straight line

Fig. 2: Ultrasonography imaging of heart and reticulum at 4th ICS lest side showing compressed cardiac chambers (B-Mode) and decreased amplitude of biphasic reticular contraction (M-Mode).

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REFERENCES


