

Traumatic Reticuloperitonitis (TRP) in an Adult Female Cow: A Case Report SAQTVH, Chattogram



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List of abbreviations

Abbreviation	Elaboration
TRP	Traumatic Reticuloperitonitis
Kg	Kilogram
LV	Left Ventricle
RV	Right Ventricle
USG	Ultrasonography

Abstract

A three years Friesian crossbred cow was presented at SAQTVH, Chattogram Veterinary and Animal Sciences University with a history of anorexia, dullness, depression, swollen brisket region for the last 7days. Clinical, haemato-biochemical and ultrasound examination was operated to diagnose this pathological condition. Clinical examination revealed severe dehydration, distended jugular vein, edematous swelling in brisket and sub-mandibular region rectal temperature was found high with muffled heart sound. Whereas sero-biochemical test revealed decreased protein, phosphorus levels and increase of calcium and sGOT values than the normal findings of a cow. Ultrasonography is considered as an excellent diagnostic tool also exposed the occurring morphological changes of reticular and abdominal wall and also revealed the deposition of fibrin in the right and left ventricle of heart. Cow was treated with antibiotics (oxytetracycline), anti-inflammatory drug along with supportive therapy for 5days.

Keywords: Traumatic, Edema, Ultrasonography, Biochemical.

Chapter 1: Introduction

Traumatic reticuloperitonitis commonly known as hardware disease remains one of the most important digestive disorders of cattle in addition to abomasal displacement (Mousavi *et al.*, 2007). Bovines are more likely to ingest foreign bodies than small ruminants due to their lack of discriminatory dietary habits between metallic materials in feed especially those reared around urban and peri-urban areas and do not completely masticate the food before swallowing (Parad *et al.*, 2017; Aiello *et al.*, 2016; Mccurin *et al.*, 2006). Ingestion of a foreign body may also be associated with phosphorus deficiency. Traumatic reticuloperitonitis (TRP) is resulted from accidental swallowing and penetration of a metallic foreign body through the reticular wall, causing acute peri reticular inflammation, adhesions and abscesses (Abdelaal *et al.*, 2009; Floeck *et al.*, 2001). Sometimes, the foreign bodies may penetrate neighboring tissues of the reticulum like spleen and liver (Radostits *et al.*, 2007; Orpin *et al.*, 2008). The honey comb like structure of the reticulum provides many sites for fixation of the foreign body, contraction of the reticulum may push a sharp foreign body through the wall. Development of severe sequel to the penetration of the reticular wall depends on the characteristics of the foreign body as well as the direction and the extents of the penetration (Gokce, 2007). This ailment leads to magnificent economic losses of dairy industry by decreasing milk and meat production and death of premium genetic resource of the farm (Sharma *et al.*, 2015). Economic losses and high morbidity, difficulty in early prediction and difficulty in evaluation of its sequel by physical examination drives researchers to go deep in the diagnosis and treatment of this syndrome (Makhdoomi *et al.*, 2018; Smith, 2009).

Generally acute TRP is manifested by anorexia, decreased milk production, fever, ruminal atony and tympany, abdominal pain, arched back, abdominal guarding and tense abdomen (Dirksen *et al.*, 1990; Francoz *et al.*, 2015; Constable *et al.*, 2017). Chronic diseases contrarily are often less apparent. There may be additional signs in cattle with sequelae such as traumatic pericarditis (Braun, 2009), liver abscesses (Braun, 1995) or cranial functional stenosis (Maddy, 1954; Constable *et al.*, 2017). The most important biochemical findings are increased concentrations of total protein and fibrinogen. Pinching of the withers, gradual application of pressure followed by sudden release of pressure on the area between the xiphoid and the umbilicus using a pole and percussion of the abdominal wall with a rubber hammer over the region of the reticulum are the most useful foreign body tests for TRP (Dirksen *et al.*, 1990). Others include the zone

test developed by Kalchschmidt, leading the animal up and down a steep incline and ferroscope to detect the presence of metal (Dirksen *et al.*, 1990). The signs of TRP are dependent on the site of reticular perforation and lesions caused by the foreign body in the surrounding areas (Habel, 1975; Abdelaal *et al.*, 2009). The condition is generally progressive and the clinical signs change as the disease progresses from the initial acute phase through a sub-acute to a chronic phase (Radostits *et al.*, 2007).

Diagnosis of TRP can be done based on history and clinical findings, although additional methods such as total and differential blood leukocyte counts, serum biochemical profiles, abdominocentesis, plain or contrast radiography, ultrasonography and exploratory laparotomy can be employed. In affected cattle, differential diagnosis can be difficult, especially in the initial evaluation (Abdelaal *et al.*, 2009).

The safest, useful, reliable and confirmatory way of diagnosing traumatic reticuloperitonitis (TRP) and pericarditis is Ultrasonography as its superiority to radiography in evaluation of reticular contour, fibrinous deposits, abnormal gas/fluid accumulation and intra-abdominal masses (Senna *et al.*, 2003). It provided exact information concerning the various sequelae of TRP in cattle and buffaloes. Moreover, ultrasonography made it possible to determine the location and extent of the lesions accurately, and the site best suited for abdominocentesis and thoracocentesis (Saleh *et al.*, 2008; Abdelaal *et al.*, 2009).

Therefore, the present study was conducted with the aim to describe the clinical sign of traumatic reticuloperitonitis in cattle and ultrasonographic findings of it as a diagnostic tool.

Chapter 2: Materials and methods

Case history

A three years old Holstein Friesian crossbred cow was presented at SAQTVH, Chattogram Veterinary and Animal Sciences University with the history of anorexia, dullness, depression, arched back, swollen brisket region in past 7 days.

Clinical examination

Evaluation of the data concerning history, age, sex, breed, duration of illness, food intake, rumination, defecation, reproductive status, milk yield, signs of pain, coughing, regurgitation, presence or absence of tympany and body weight were collected. Rectal body temperature, heart rate, respiration rate, rumen motility and rectal examination were noted and performed (Jackson *et al.*, 2007).

Serum Biochemical Analysis:

Blood sample was collected from the tail vein for hematological examination. Table 1 below show the results. Total protein (gm/dl), sGOT (u/L), ALP (u/L), Calcium (mg/dl), Phosphorus (mg/dl), Magnesium (mg/dl) were estimated by standard method. Peripheral blood was collected for screening of hemoprotozon and fecal sample was collected for screening of endo-parasitic infestation.

Ultrasonographic examination

Exago–Veterinary portable Ultrasound scanner, Canada were used for examination of the different compartments of the compound stomach of the cattle. The animals were prepared for examination both sides of the ventral part of the lateral abdominal and thoracic wall. Coupling gel was spread on the area of the examination. Scanning was started from the ventral abdominal wall toward the intercostal spaces on both sides. The transducer was moved dorsoventrally on each intercostal space for accurate examination.

Case management

A tentative diagnosis of traumatic reticulo-pericarditis was made following the history, clinical examination, biochemical results and ultrasonographic findings. Due to the severity of presentation and the reported history prognosis was expected to be grave and the owner was advised.

Based on the clinical examination and other diagnostic examination the cow was treated with ketoprofen (Kynol Vet® SK+F Ltd Bangladesh) @3.3mg/kg body weight, oxytetracycline (Renamycin LA® Reneta Ltd Bangladesh) @10mg/kg body weight, amino acid preparation (Aminovit plus Vet® Popular Ltd Bangladesh) @10ml/ kg body weight for 5 days. In spite of the present therapy the cow was sold after 7days of post therapy and as a result postmortem examination can't be done.



Figure 1: Distended jugular veins in cow with traumatic reticulopericarditis.



Figure 2: Oedema of the submandibular region and brisket in cow.

Results and Discussions

Cattle and buffaloes do not use their lips to discriminate between very fibrous feed and metallic objects in feedstuffs (Fubini *et al.*, 2008). The method of food prehension in this species is by tongue with the included foreign bodies. So, sharp metallic foreign bodies were implicated as a cause in most of the digestive disorders in cattle and buffaloes. When these foreign bodies ingested by these animals enclosed with their food and penetrate the reticular wall as a result of the ruminal contractions and lead to many serious complications (Misk *et al.*, 2001).

The signs of traumatic reticuloperitonitis are dependent upon the site of reticular perforation and lesions caused by the foreign body in the surrounding areas. Numerous scientific papers have been described the clinical signs of traumatic reticuloperitonitis in cattle. Anorexia, decrease in milk production, fever, tachypnea, reluctance to move and stance with an arched back and abducted elbows are the most common signs (Fubini *et al.*, 2007). Abdominal pain, fever, toxemia and a reduction in the amount of faeces (Radostits *et al.*, 2000).

Clinical examination of cow expressed pain while back grip test and palpation for tenderness which is in line with a previous study conducted by (Sudhakara, 2014). Edematous swelling was found in the brisket region and submandibular area of cow (Figure 2) severe dehydration, distended jugular vein also found of the cow (Figure 1). The rectal temperature was found 105°F Muffled heart sound found, also respiration sound was muffled measured by stethoscope, because of being obstructed in way (Ward *et al.*, 1994; Dirksen *et al.*, 1990).

Peripheral blood examination and stained smear did not reveal any hemoprotozoan. Fecal examination or coproscopy did not reveal any parasitic egg under the microscope.

The sero-biochemical parameters had reduction in Protein (3.60 mg/dl), Phosphorus (1.81 mg/dl), Magnesium (1.22 mg/dl) level. Elevated level of Calcium (19.23 mg/dl) was noticed. Revealed normal level of ALP and SGOT (73.33u/l).

Table 01: Sero-biochemical parameters of cattle

Parameter	Results	Normal Ranges
Protein	3.60 mg/dl	6.74–7.46 mg/dl
Calcium	19.23 mg/dl	2.81-10.91 mg/dl
Phosphorus	1.81 mg/dl	5.2 mg/dl
Magnesium	1.22 mg/dl	1.8-2.4 mg/dl
SGOT	73.33u/l	11-40 u/l

Abdominal ultrasonography is an excellent diagnostic and prognostic tool in deciding whether the animal should undergo surgical or medical treatment or be slaughtered (Braun, 2005). It is an ideal diagnostic tool for investigating gastrointestinal disorders in cattle. In animals with traumatic reticuloperitonitis, inflammatory fibrinous changes and abscesses can be imaged (Braun, 2009). So, USG provided exact information concerning the various sequel of TRP in animals. Moreover, ultrasonography made it possible to determine the location and extent of the lesions accurately, and the site best suited for abdominal and thoracocentesis. Ultrasonographic examination of the patient revealed areas of (Figure 3) mixed echogenicity of fibrin deposits between the reticulum and abdominal wall which is supported by (Abdelaal *et al.*, 2009; Ghanem, 2010; Raof *et al.*, 2012). There was a large amount of hypoechogenic to echogenic pericardial fluid and echogenic deposits and strands of fibrin between the pericardium and the epicardium. In cows Ultrasonographic findings of TP were represented by mixed echogenicity in the pericardial sac (Figure 4). This might be due to presence of turbid pericardial fluid, which in more progressive cases of the pericarditis, appeared as extensive hyperechoic strands in the pericardial sac. These findings are similar to those reported by (Braun, 2009; Abdelaal *et al.*, 2009).

Normally, the pericardial layer did not see in healthy animals, but in the affected animal, it was typically seen as a thick echoic membrane surrounding the heart.

Reduced or absent biphasic reticular contractions and deposition of inflammatory materials on its serosal surface were the classical ultrasonographic identifies in TRP, according to (Mohamed *et al.*, 2007) described reticular and thoracic abscesses as

circumscribed masses with an echoic/echogenic content. Healthy bovine reticulum appeared half-moon shaped with a smooth contour which plays a crucial role in the ruminant digestive tract because the primary cycle of rumen motility always starts with a reticular contraction (Braun *et al.*, 2011).

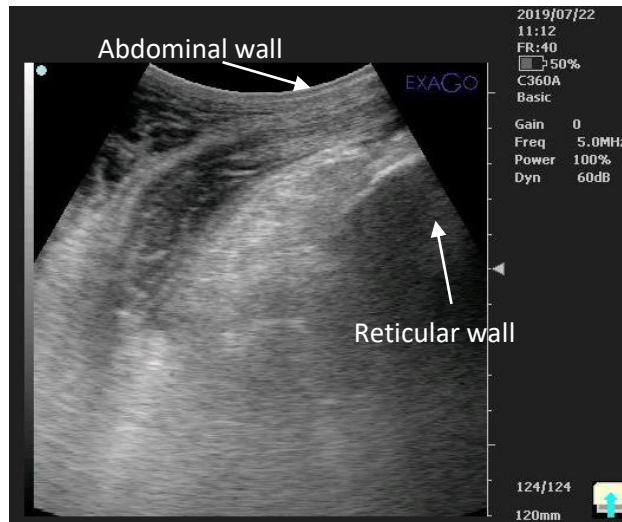


Figure 3: Large area of hyper echogenicity of fibrin deposits and anechogenic area of inflammatory exudates and fluid between reticulum and abdominal wall.

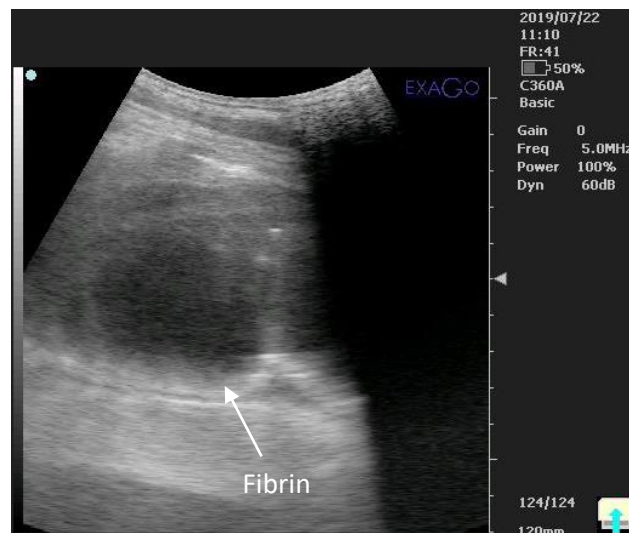


Figure 4: Hypoechoic area of inflammatory exudates strands of fibrin

hypoechoic area of inflammatory exudates strands of fibrin was seen floating in the fluid between the epicardium and pericardium (P) and the surrounded with hyperechoic

appearance of thickened pericardium (P). There were hypertrophied myocardial muscles of the left and right ventricles. LV and RV).

Conclusions

The findings of this paper indicate that Traumatic reticuloperitonitis can be diagnosed on the basis of individual clinical or laboratory criteria followed by ultrasonographic findings. Ultrasonographic examination can also be useful in prognosis of the TRP affected animal.

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Biography

I am Md Imrul Kayes Sujon, son of Md Mosharof Hossain and Sheuly Yesmin. I have completed my Secondary School Certificate examination in 2012 (G.P.A 5.00) followed by Higher Secondary Certificate examination in 2014 (G.P.A 5.00). Now I am an intern veterinarian under the Faculty of Veterinary Medicine in Chattogram Veterinary and Animal Sciences University. In future I would like to work as a veterinary practitioner and do research on clinical ailment of animals in Bangladesh.