

Traumatic Reticulo-Peritonitis in an Adult Friesian Holstein Cow: A Case Report

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ABSTRACT

An adult Friesian Holstein cow raised in a zero-grazing system was presented with a history of being off feed, respiratory distress and no defecation since 04/09/2018. She had been treated without any significant improvement. There was improvement with subsequence treatment. A week later, the cow became off feed and abscess developed on the right ventrolateral aspect of the thoracic region filled with purulent pus. General examination revealed good body condition, dullness and depression, grunting and grinding of teeth. Physical examination revealed normal respiratory and heart rate, temperature of 38.4°C, ruminal atony and no eructation. Hematological analysis revealed septicemia evident by neutrophilia. The animal was managed with 20% Oxytetracycline 15mg/kg given intramuscularly and multivitamins given via intramuscular route. Surgical management of the abscess was managed by lancing and draining the pus and a long wire was incidentally recovered, then lavaged with hydrogen peroxide, normal salt and povidone iodine, and antibiotics for three 3 days. The cow fully recovered. This communication reports a case of traumatic reticulo-peritonitis (TRP) caused by a long wire (10.1cm long). The wire penetrating through the reticulo-ruminal wall, abdominal cavity and the thoracic wall, and sequela to an abscess and localized peritonitis. Therefore, dairy cattle with signs of constipation, ruminal stasis, ruminal impaction, abscess and more than seven months pregnant, one should consider traumatic reticulo-peritonitis as differential diagnosis.

Key words: Abscess, Cattle, Management and Traumatic Reticulo-Peritonitis (TRP).

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INTRODUCTION

Foreign body syndrome is a common condition seen globally in large ruminants especially dairy cattle and rare among the small ruminants (Parad et al. 2017). It often leads to loss of premium genetic resources in farms. The etiology of TRP is ingestion of metallic materials via feed materials especially hay among the zero-grazed and free grazing cattle near construction sites (Cramer et al. 2005). It's common among dairy animal reared in zero-grazing, urban and peri-urban areas (Parad et al. 2017). The prevalence of TRP in adult dairy cattle has been attributed to longevity of keeping females in the farm more than male animals, management practices and lack of discriminatory dietary habits of cattle (Radostits et al. 2007; Hajjigharamani and Mohsen 2010).

With lack of adequate space and urbanization, animals are kept in a zero-grazing unit where feeds are provided daily in feed trough where nail and wire may fall in to the feed in the process (Parad et al. 2017). However, lack of mineral supplementation results in deficiencies thus, the cattle tend to consume materials containing metal resulting in traumatic reticulo-pericarditis (TPR) or traumatic reticulo-peritonitis diseases (Diver and Peek 2008).

The modern diagnostic methods and treatment approach of foreign body syndrome cases in the current era has advanced. There is high success rate of managing early reported cases (Braun et al. 2018). Most of these cases are reported to veterinary experts for treatment once the case has advanced and less can be done to manage the cases since there are extensive pathological change (Parad et al. 2017). A case of TPR accompanied with abscess on the ventrolateral aspect of the right thoracic is discussed.

MATERIALS AND METHODS

Case History of the Animal

An adult Friesian Holstein cow case number AD/030/2018 from Gitaru, Kiambu County was presented to the Large Animal Clinic, University of Nairobi, on 8th September, 2018. She had been treated with liquid paraffin orally, magnesium sulfate oral drenching and multi-vitamin injection without any significant improvement. There was slight improvement with subsequence treatment with oral administration of liquid paraffin and multivitamin. A week later, the cow became off feed, with ruminal stasis and abscess developed on the right ventrolateral aspect of the thoracic region filled with purulent pus.

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Clinical Examination

General examination revealed fair nutritional status of about 3 in a scale of 5, anorexia, dullness and depression, minimal grunting and grinding of teeth, nodular like lesion on neck and ventrolateral aspect of the right thoracic region. Physical examination revealed normal respiratory and heart rate, temperature of 38.4°C, ruminal stasis and no eructation, lanced abscess contained purulent pus mixed with bloody content and a wire was recovered. The recovered wire was rusted and measured about 10.1 cm long (Fig. 1 and 2).

RESULTS

Hematological Results

ETDA blood sample was collected from the tail vein for hematological examination as shown in Table 1. The leucocytes were elevated with a slightly high neutrophil count (highlighted in blue) while lymphocytes were within the normal range.

Case Management

A confirmatory diagnosis of TPR was made following the history, clinical examination, hematological results and surgical management of the case (Serem et al. 2019). The cow was treated for ruminal impaction with a litre of liquid paraffin and 2 litres of warm water, 20% tetracycline injection at 20mg/kg and multi-vitamin injection. The animal had chronic ruminal stasis, however, with subsequent recurrence of the condition with an underlining clinical sign such as ruminal atony and an abscess, surgical management was indicated. The abscess was surgically managed by lancing and draining, incidentally a wire was recovered, removal and lavage with 50% hydrogen peroxide, NaCl and 50% povidone iodine. The cow was put on antibiotics for three days and she fully recovered.

DISCUSSION

Traumatic reticulo-peritonitis disease is a sporadic disease of both wild and domestic ruminants associated with ingestion of metallic foreign bodies. The condition has a higher incidence among female cattle because they are kept longer in the farm than male animals. Among the affected females, Friesian Holstein forms the majority since they are the majority of the cattle reared in most regions across the Africa, America, Europe, Asian and Australia continent. The incidence of the disease is high among cattle fed on chopped roughages and silage, and are kept in a zero-grazing unit which it is in agreement with other studies (Radostits et al. 2007).

In the present study, the typical clinical picture of TRP was observed in the last trimester which it is in agreement with past studies (Hajighahramani and Mohsen 2010; Serem et al. 2019). This may be due to the combination of weight and size of the gravid uterus that probably allows the organ to act like a pendulum as a cow gets up and down;

Table 1: Hematology results of an EDTA blood sample of the adult Friesian Holstein cow

Cells	Results (%)	Normal Ranges
Neutrophils	49	15 - 33
Immature cells	02	0.0 - 0.2
Lymphocytes	50	45.0-75.0
Monocytes	02	0.1 - 0.7



Fig. 1: Clinical findings of a case of Traumatic Reticulo-Peritonitis of a cow (a. lanced abscess, b. lanced abscess with a wire, c. purulent pus with blood & d. recovered wire from the peritoneum)

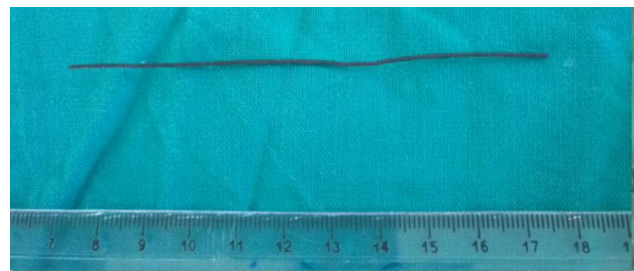


Fig. 2: Recovered wire which has penetrated through the ruminal wall, peritoneum, muscles and fascia on the right thoracic wall resulting on an abscess formation

this can apply physical pressure to the rumen and reticulum, contributing to perforation by an existing sharp metallic object. Other predisposing factors to hardware disease has an association with indiscriminate ingestion behavior of cattle and condition causing pica such as phosphorus deficiency (Divers and Peek 2008). The anatomical location of organs, the diaphragm, pericardium and heart are located cranially to reticulum, liver position dorsally and medially, and spleen dorsally and laterally may be expose to foreign body syndrome (Harwood 2004).

Sources of foreign bodies include; tyre wire since tyres are used to weigh down the silage and only removed when they start wearing out, this contributes to feed contamination (Cramer et al. 2005). Wide variety of metallic fragments at the construction sites, including fencing wires, copper wires, staples, nails, hypodermic needles and high tensile wire from palettes (Hateley 2007;

McNamara and Baker 2007). Mixer wagon blades disintegration act as major source of metallic fragments (Daniel and Smith 2008). In the study done by Serem et al. (2019), the postmortem findings showed numerous wires and nails in the reticulum which the animal might have obtained from decomposing wood from the animal houses and the sawdust (collected from carpentry workshops) that were used as bedding. The coins found in the rumen also may have coincidentally fallen into the animal feeds as the owners chopped the feeds.

Other risk factors include contraction of reticulum and pressure of calf during late pregnancy and effort of parturition promote penetration of the wall by foreign bodies (Shahin and Mohsen 2010), this is similar to this case as the cow was 7 months pregnant. The prevalence of hardware disease increases with increase in the rate of exposure of cattle to foreign material and the nature of foreign bodies. Stall fed animals with chopped feed, roughage and silage are at high risk of the disease. Furthermore, female animals have increasing incidence of this disease than male animals due to the fact that female are kept for longer periods than male (Radostits et al. 2007).

Clinical signs associated with TPR include fever, dehydration, increased heart and respiratory rate, anorexia, decreased milk production, ruminal stasis, weight loss, abdominal tension, chronic tympani, rigid abdominal pain with grunting and abdominal tension (Divers and Peek 2008; Orpin and Harwood 2008) and these clinical signs are in agreement with the present study. The general demeanor, condition and appetite of cattle is abnormal, signs of pain like bruxism and grunting, fever of 40.2°C, however, normal or sub-normal rectal temperature may be noted (Braun et al. 2007). In the present study, the cow had extensive abscess formation on various parts of the body wall such as neck region, around the superficial gluteal muscles, thoracic and abdominal wall. This may be associated with hematogenous spread of infectious conditions such as colibacillosis, salmonellosis, pasteurellosis, anaerobic infections and septicemia may be observed (Grunder 2002).

The diagnostic approach employed was based on cow-side test and laboratory tests (Cockcroft and Jackson 2004). Cow-side test involved complete and clear history of the cow obtained from the farm, then a systematic examination of the case was employed (Serem et al. 2019).

Hematology results revealed slight neutrophilia an indication of underlying systemic infection due to normal flora from gastrointestinal system into systemic circulation similar findings reported by (Braun 2009). Traumatic pericarditis results showed lymphopenia, basopenia, eosinopenia, monocytosis, neutrophilia, leukocytosis, erythrocytopenia, and low hemoglobin, however, hematological changes are significant in animals with traumatic pericarditis compared to animals with traumatic reticulo-pericarditis (Orpin and Harwood 2008; Ghanem 2010).

TRP management may involve either surgical or conservative treatment (Orpin and Harwood 2012). Conservative therapy involves restriction of movement to prevent penetration of the foreign body and their migration cranially and allow magnet bolus to work, administration of non-steroidal anti-inflammatory drugs (NSAIDS) for

analgesic effects, administration of broad-spectrum antibiotic treatment for at least five days and placement of magnet bolus in the rumen may aid in recovery (Braun et al. 2003 and Orpin and Harwood 2008). Surgical treatment being the gold standard in management of TRP may be done either as an immediate or delayed surgery. Immediate surgery reduces the risk of penetration of foreign objects in the thoracic or abdominal region. In delayed surgery, this may be carried out two days after onset of medical therapy especially in non-responsive cases (Orpin and Harwood 2008).

In the present study, the cow was managed by medical treatment and surgical treatment. Medical management entailed oral administration of a liter of liquid paraffin and 2 liters of warm water, and 450mg/ml penicillin-dehydro-streptomycin injection at 25mg/kg body weight of the animal. Surgical management entailed drainage of the abscess at the ventro-lateral aspect of the thoracic region and removal of wire of about 10.1cm long which was an incidental finding in the line of treatment. The animal fully recovered after removal of the wire and followed by antibiotics and anti-inflammatory medication for three days.

Conclusion

This case report documents a case of TPR caused by a long wire (10.1cm long) penetrating through the reticulo-ruminal wall, abdominal cavity and the thoracic wall, and sequela to an abscess and localized peritonitis. The cow was diagnosed with constipation and ruminal impaction was treated and it responded to medical treatment, however, the condition recurs with an associated abscess on right ventrolateral aspect of the thoracic region. Pus was drained from abscess and a long wire was recovered, thus, this led to confirmed diagnosis of TRP. A 5-day antibiotics was instituted and the cow fully recovered. Therefore, dairy cattle with signs of constipation, ruminal stasis, ruminal impaction and more than seven months pregnant, one should consider traumatic reticulo-peritonitis as differential diagnosis.

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