

## Foreign Body Syndrome in Large Ruminants

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Cattle and buffaloes are indiscriminate feeders because they cannot distinguish metallic materials from feed and don't completely masticate the food before swallowing. As a result, they consume sharp metallic items like nails or wires, which, due to the reticulum's honeycomb structure, settle in it and puncture it (Fig. 1). This causes a condition known as "Foreign body syndrome" (FBS) and is also known as "Hardware Disease", "sharp foreign body syndrome" (SFBS) or "traumatic reticulo-peritonitis" (TRP). Due to inadequate waste management and lack of recycling of industrial waste, foreign body syndrome has been seen in cattle, particularly in developing nations.

Malnutrition and imbalanced eating habits can also result in the consumption of materials other than the regular feed, such as garbage, resulting in this condition. This syndrome has a significant economic impact since it causes severe reduction in milk production and may result in animal mortality. The dairy sector has suffered a significant loss because of this condition, which has been responsible for more than 15% of all-natural mortalities in dairy and beef animals. It has a high incidence in India, ranging from 23% to 87%.



**Fig. 1 The honey-comb structure present inside of the reticulum**

The economic losses and the number of animals afflicted are so high that researchers are investigating deeper into the diagnosis and therapy of this condition. The clinical manifestations of this syndrome vary greatly and as a result, diagnosing and managing FBS is considerably difficult.

### Cause of TRP

Traumatic reticulo-peritonitis is a localized inflammation of the reticulum's wall that is typically brought on by the animal ingesting a sharp object (such as a nail or wire) that perforates it. Being indiscriminate feeders, cattle may consume wire, nails or needles if they are present in the feed. These sharp metal objects get trapped and penetrate the reticulum if they are longer than 2.5 cm. Traumatic reticulo-peritonitis (TRP) is then brought on by the leakage of gut contents and bacteria into the abdominal cavity resulting in peritonitis. Coughing, mounting and abdominal compression during advanced pregnancy increase the chances of penetration. This condition is significantly less prevalent in other ruminants like goats and sheep, who are discriminating feeders.

### Clinical Findings

Clinical symptoms that are most frequently observed include decreased feed intake, low rumen motility, a slight temperature, decreased milk output, poorly digested faeces, and pain signals. The left paralumbar fossa (Fig. 2) may be distended, suggesting rumen tympany or an impacted rumen due to issues with eructation. Even under conditions of minimal feed intake, the impaction seen in the FBS cases is related to diminished ruminal motility brought on by reticulum adhesions, contraction disturbances, a decrease in outflow and an increase in rumen and reticulum content. As the transit time lengthens, the consistency and composition of the faeces become abnormal.

During initial stage of penetration of the reticulum, there is sudden development of rumino-reticular atony, mild ruminal tympany and a significant drop in milk output. Rectal temperature is mildly to severely increased. Increased heart rate and respiratory rate with shallow and rapid breaths can be

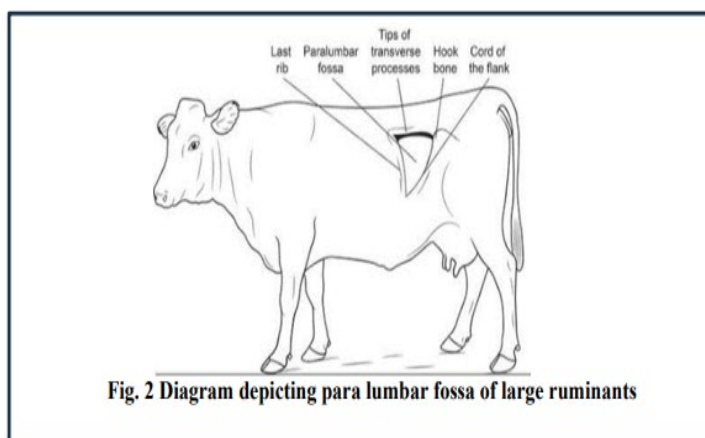


Fig. 2 Diagram depicting para lumbar fossa of large ruminants



seen. Clinical signs seen include an arched back, erect hairs at the withers, anxious expression, reluctance to move and sit, holding the neck low, an uneasy, careful gait and sometimes refusal to go down-hill and staggering gait, all of which are caused by discomfort due to irritation of a foreign material in the reticulum. In addition to groaning, forced sudden movements such as urinating, defecating, lying down and getting up can also be seen. Signs of cranial abdominal discomfort become less noticeable as the acute inflammation fades and the rectal temperature typically recovers to normal.

Chronic cases are characterized by illness or poor performance lasting weeks or months, occasionally interrupted by intervals of apparent improvement or by recurrent episodes of illness characterized by decreased feed intake, poor rumination, decreased rumen motility, mild recurring ruminal tympany, constipation or diarrhoea, poorly digested faeces, weight loss and low milk production.

### **Complications of TRP**

TRP can result in reticular abscesses, splenic and hepatic abscesses, the development of reticular fistulas and vagal indigestion. Diaphragmatic hernia, thoracic illness (pleurisy, pneumonia) and pericarditis (traumatic reticulo-pericarditis) may result from the piercing metal migrating into the diaphragm. Acute reticulo-pericarditis related heart failure can cause certain animals to die very quickly.

**Traumatic reticulo-pericarditis:** When sharp foreign objects are ingested, and they pass through the reticulum, they sometimes penetrate the diaphragm and then the pericardium to cause traumatic reticulo-pericarditis. Tachycardia, jugular vein distention, muffled heart sounds, submandibular, brisket and ventral oedema are the most typical clinical symptoms. As these clinical signs appear in several other illnesses, it is challenging to make an early diagnosis.

### **Treatment**

Oral administration of a magnet may immobilize the penetrating metal and may cause it to migrate or falls back into the lumen of the reticulum. It is recommended to deliver a 3 to 7-day course of systemic antibiotic therapy (oxytetracycline, ceftiofur or procaine penicillin). A laparotomy and rumenotomy may be necessary to remove the metallic penetrant if symptoms continue and should be done under the supervision of a trained veterinarian. For pain relief and to get animals standing and feeding, non-steroidal anti-inflammatory medicines (flunixin meglumine, ketoprofen, meloxicam or tolfenamic acid) may be required.



**Traumatic reticulo-pericarditis:** This condition has a poor prognosis and often non-responsive to treatment, thus it requires careful management if significant losses are to be avoided.

#### Prevention

- Feedstuffs should not be contaminated with nails, needles or short pieces of wire.
- Oral administration of magnets may help in preventing TRP as the magnet eventually lodges in the reticulum and then prevent metal from penetrating the reticulum. There is strong evidence that providing magnets to all cattle at an early age (less than one year) reduces the occurrence of traumatic reticulo-peritonitis.
- Large magnets may be used on production lines by producers of processed feed to get rid of metallic impurities.
- Use of baling wire should be avoided for different purposes.
- Keeping cattle away from sites of new construction and completely removing old building fences and scrap material from the large ruminant grazing areas.

#### Conclusions

The purpose of this article is to increase the awareness about the causes and preventive measures that should be taken to decrease the incidence of foreign body syndrome in cattle and buffaloes because of its significance in both animal production and health. This condition is easily avoidable by implementing appropriate preventive measures. When it comes to traumatic reticulo-pericarditis, prevention is always preferable to treatment, especially given the poor prognosis.

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