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Chronic ruminal impaction in goats and its surgical management: A two case studies

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Abstract

A four-year-old female non-descriptive Goat and a two-year-old male white African Boer was presented to the Veterinary clinical complex, College of Veterinary Animal Sciences, Udgir with a history of anorexia and weight loss in eight days. Clinically, all physiological parameters were in normal range, however abdominal palpation revealed hard ruminal consistency indicates the chronic impaction. Lateral radiographic examination of reticulo-thorax of both animals showed presence of non non-penetrating foreign body (NPFB) in the reticulum. On basis of history, physical and radiographic examination, both the goats were operated for laparo-rumenotomy for removal of NPFB under regional and local infiltration anaesthesia. To conclude, both the animals with non penetrating reticular foreign bodies causing chronic ruminal impaction leading to loss of body condition and it was successfully removed via Laparo-rumenotomy without complications and they assumed normal appetite.

Keywords: Goats, anorexia, foreign body, ruminal impaction, rumenotomy

Introduction

Ruminants have an unusual digestive system that is divided into four sections, the rumen, reticulum, omasum, and abomasum. The abomasum alone produces digestive enzymes; hence it is responsible for breaking down food (Phillipson, 1999) ^[1]. Due to the production of volatile fatty acids (VFAs) by the microorganisms found in the rumen (mostly ciliated protozoa and bacteria, but also yeasts), ruminants can digest fibrous plant material. VFAs are absorbed through the ruminal wall or later in the omasum and abomasum (Barcroft *et al.*, 1944) ^[2], and they are derived from complex carbohydrates and other products (such as proteins and B vitamins) (Ducharme, 1990) ^[3].

The ruminal volume of small ruminants is estimated to be 5.3 litres, accounting for around 13% of their body weight (Owens and Goetsch, 1993) ^[4]. Other authors estimate the ruminal content in sheep to be around 4-6 kg (Phillipson, 1999) ^[1], however these figures may vary depending on nutrition and transit through the digestive tract.

Foreign body accumulation in the rumen inhibits the absorption of volatile fatty acids, which lowers the animal's production. As a result, this has a significant economic impact (Igbokwe *et al.*, 2003) ^[5]. The present paper represents the rare cases of chronic ruminal impaction in two goats leading to loss of body condition due to presence of non penetrating reticular foreign bodies which was diagnosed via radiography.

Case History

A Four-year-old female Non-descriptive (Case no.1) and A 2 year old male African Boer Goat (Case no. 2) were presented to the Department of Veterinary Surgery and Radiology, College of Veterinary Animal Sciences, Udgir, Maharashtra at different intervals of time with a same history of anorexia since 6 and 4 days respectively accompanied with ruminal impaction and absence of rumination. Both the animals were treated symptomatically by local veterinarian; however there was no relief from the ruminal impaction. The heart rate, temperature, and respiration rate were all in the normal range. The blood picture showed leucocytosis (14,000 cells/cmm), neutrophilia (94%) mild anaemic in case no.1 and mild leucocytosis (12,000 cells/cmm), and neutrophilia (87%) in case no. 2 respectively. A thorough physical examination of the left paralumbar fossa revealed distention and impaction of rumen.

Lateral radiographic examination of reticulo-thorax revealed a radio-opaque oval-shaped non-penetrating foreign body in the reticulum in case no.1 (Fig. 1) and a radio-opaque large structure in the reticulum (might be polythene bag) in case no. 2 (Fig. 2). On the basis of history, physical and radiographic examination, both the animals were subjected for exploratory rumino-laparotomy for removal of reticular foreign bodies. Following premedication with Inj. Meloxicam @ 0.2 mg/kg body weight intramuscularly, Inj. Chlorpheniramine @ 0.2 mg/kg body weight intramuscularly, Inj. Dicrysticin @ 10,000 IU/kg body weight intramuscularly. In Case no.1 surgery was performed in a standing position whereas in Case no.2 in lateral recumbency with sedation Inj. Diazepam @ 0.25 mg/kg body weight intravenously.

The left paralumbar fossa was aseptically prepared for surgery in both cases. Inverted L block was given in both surgical cases using 2% lignocaine HCL. A vertical incision is made about three centimetres from the transverse lumbar process, centre of the fossa right above the rumen's dorsal sac. The thickness of the subcutaneous layer was different in both cases as it differed with age and adipose tissue content and was then separated bluntly. The peritoneum is then found once the oblique abdominal muscles (external, internal, and transverse) have been severed. In order to avoid contaminating the abdominal cavity and muscle layers, the major goal is to exteriorize the dorsal sac and its fixation by using four stay suture. In female goat, the oval shaped reticular foreign body was removed manually whereas in male Boer, the foreign body was polythene bag (entangled material) (Fig.4) which was disintegrated into multiple pieces for easy removal via large ruminal incision. The rumino-reticular fold, esophageal orifice and omasal orifice were palpated to detect any abnormalities and found to be normal. Some quantity of ruminal content was removed in order to decrease the impaction.

Rumencoric bolus and 100 gm of acid-base balance powder were administered intra ruminally. The rumen incision was closed by inverted suture pattern (Cushing followed by Lambert) (Fig.3). as it gives a sealed closure that inhibits the leaking of rumen content into the peritoneal cavity. Laparotomy wound was closed in three layers with absorbable suture material that closes the peritoneum and transverse abdominal muscle together and the external and internal abdominal oblique muscles together using a simple interrupted suture pattern. Skin was closed by simple interrupted pattern with nylon (Fig 5). Postoperative, both the animals received Inj. Meloxicam 4ml and inj. Dicrysticine 2ml intramuscularly for five days and skin sutures were removed on 10th postoperative days.

Rumenotomy is one of the most often utilized surgical methods in ruminants, accounting for up to 94% of all goat surgeries in some places (Hayder, 2004) [6]. Although the surgical procedure for both large and small ruminants is quite similar, the technique has been well reported in cattle (Niehaus, 2008; Callan and Applegate, 2017; Martinez *et al.*, 2019) [8, 9, 10], but not so much in small ruminants. Rumenotomies, on the other hand, are a popular procedure for removing foreign bodies in goats (Hayder *et al.*, 2006) [7].

According to recent research, nonsteroidal anti-inflammatory drug use during surgery should be taken into consideration (Callan and Applegate 2017) [9], even up to 7 days after the intervention (Das and Behera 2011) [11]. Broad spectrum antibiotics such as oxytetracycline (Saidu *et al.*, 2020) [12], penicillin (Haven *et al.*, 1992; Hayder, 2004; Geehan *et al.*, 2006) [13, 6, 14], ampicillin or ceftiofur (Callan and Applegate,

2017) [9] should be administered because rumenotomy is a non-aseptic procedure.

Goat is known for their browsing habit; however, due to urbanization and lack of grazing area make them eat unwanted material particularly polythene bags filled with vegetables raw material thrown by people, sometimes it might be because of a condition known as pica, which is sometimes seen in areas of nutritional deficiency (Fraser and Bergeron 1991) [15], is associated with the ingestion of foreign bodies (Pugh and Baird 2012) [17]. Pica is characterised by craving and appetite for non-edible substances, especially for elements and trace elements, such as salt, cobalt, or phosphorus. When indigestible material builds up in the rumen, a hard mass can form (Geehan *et al.*, 2006) [14], which can result in impaction (Ashwini and Vandana 2017; Tyagi and Singh 2012) [18, 19], gas buildup and even cause mortality (Das and Behera 2011) [11]. Rumenotomy is advised in certain instances.

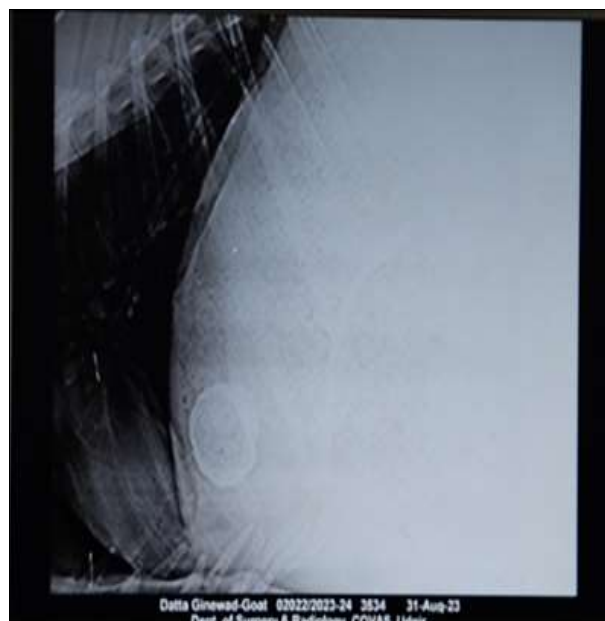


Fig 1: Radiographic examination revealed oval shaped NPF in reticulum in case no. 1

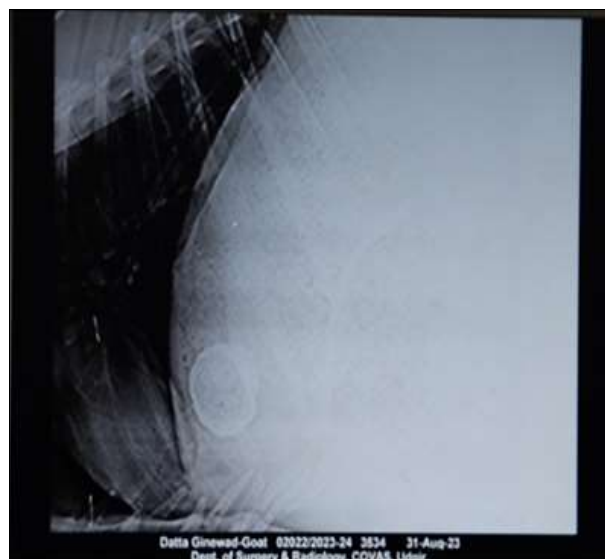


Fig 2: Radiographic examination revealed oval shaped NPF in reticulum in case no. 2



Fig 3: Closing of rumen (Cushing's followed by lambert suture pattern)



Fig 4: Procured foreign bodies from case no. 1 and case no. 2



Fig 5: Post surgery recovery of case no. 1 and case no. 2

Conclusion

To conclude, the two cases of caprine presented to the hospital with a history of loss of appetite gradually and it was diagnosed as an non-penetrating ruminal foreign body which was removed successfully via rumenotomy without any complications.

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