

SUCCESSFUL RUMENOTOMY FOR RETRIEVAL OF AN INGESTED CAR KEY IN DAIRY COW: A CASE REPORT

SONAM CHODEN^{1*}

¹District Veterinary Hospital, Trashiyangtse

*Author for correspondence: sonamceevet@gmail.com

Copyright © 2026 Sonam Choden. The original work must be properly cited to permit unrestricted use, distribution, and reproduction of this article in any medium

ABSTRACT: Foreign body ingestion is a common issue in cattle that may lead to serious complications if not managed promptly. A 9-year-old cross-breed jersey dairy cow was presented with suspected ingestion of an automatic car key one week prior to presentation. The cow was clinically normal at presentation, and diagnostic facilities including radiography were unavailable. The tentative diagnosis was based on the owner's history and automatic unfolding of the car's side mirrors when the cow approached, indicating proximity to the key. Exploratory rumenotomy was performed under standing sedation with proximal paravertebral nerve block. The key was successfully retrieved from the reticulum without any complications. The cow remained physiologically stable throughout the perioperative period, with uneventful recovery within two weeks. Exploratory rumenotomy proved feasible in resource limited field settings with systemic clinical evaluation. Successful retrieval resulted in uneventful recovery. Vehicle sensor activation based on proximity served as an unconventional field diagnostic indicator.

Keywords: Cow; Rumenotomy; Metallic foreign body; Reticulum; Case report; Surgical management.

1. INTRODUCTION

Cattle are predisposed to foreign body ingestion due to their indiscriminate feeding behaviour and incomplete mastication of feed prior to deglutition (Fesseha 2020). As a result, metallic objects may be ingested intact and subsequently settle within the reticulum. In this case, contaminated feed served as the source of foreign body, likely attributable to inadequate feed handling and management practices.

Following ingestion, metallic foreign bodies typically gravitate towards cranioventral reticulum due to ruminal contractions. The raised reticulo-omasal orifice restricts further movement in the abomasum. Owing to the honeycomb like reticular mucosa and greater specific gravity of the metallic foreign body, they tend to settle within and become lodged in the reticular floor (Constable et al. 2017). Although the

ingested key was non-penetrating and singular, thereby minimizing acute traumatic sequelae-prolonged retention in the reticulum would have interfered with ruminal functions and predisposed the animal to accumulation of foreign bodies.

The present case documents the successful field based diagnosis and retrieval of non penetrating automatic car key from reticulum of an adult dairy cow in a resource-limited settings. To the author's knowledge, no prior published literature describing proximity-based diagnosis with automated key could be identified for reference.

2. MATERIALS AND METHODS

2.1 Study site

The surgery was performed in Bumdelling Gewog under Trashiyangtse Dzongkhag. The Gewog was staffed by one para-vet and lacked laboratory facilities and a large

animal operation theatre. Therefore, the procedure was performed under field conditions.

2.2 Case history and clinical finding

The patient was nine years old, female, crossbred jersey, weighing approximately 250 kg. It was maintained under a semi-intensive feeding system in lactating and non-pregnant state. Accidental ingestion of the car key was suspected one week prior when the owner observed that the parked car's side mirrors automatically unfolded as the cow passed nearby.

The owner provided consent for surgical procedure and the use of images for case report. During examination, the animal was alert and responsive with physiological parameters within normal limits. Rectal temperature 102°F, respiratory rate 15 breaths/min and pulse rate 60 beats/min. Feed intake and defecation were normal.

2.3 Diagnosis

Automatic unfolding of car mirrors when the cow approached the car was observed indicating the proximity of ingested keys (Figure 1). This practical observation supported the diagnosis but limited to the case with automated car key. It could not confirm the exact location and potential complications implicated. The presence of multiple key nearby could have given the false-positive indicator. Based on cumulative clinical evidence, an exploratory ruminotomy was



indicated.

Figure 1: Field-based diagnostic observation showing activation of vehicle side mirrors as the cow approached the car, indicating proximity of ingested key.

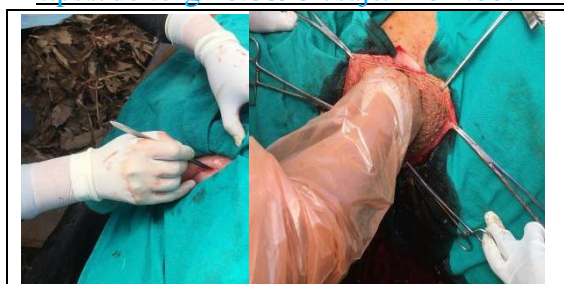
2.4 Sedation and preparation

Preoperatively, the animal was kept on overnight fasting for approximately 24 hours to reduce the ruminal content. The animal was physically restrained in standing position using robes and wooden crates. Sedation was achieved with xylazine hydrochloride (Xylazine 2% w/v, Xzin, Nicosia pharma) at 0.01 mg/kg IV. Fluid therapy with Ringer's lactate (RL, Aculife Healthcare Pvt. Ltd) at 60 mL/kg. IV over 24 h, with 30 mL/kg/h was administered to prevent hypovolemic shock. Analgesia with meloxicam (Himcam, Himabioscience) at 0.2 mg/kg IM, BID for 3 days were provided.

The left para lumbar fossa was shaved and prepared aseptically with savlon® (cetrimide 3% and chlorhexidine gluconate 0.5% solution). Proximal paravertebral nerve block was performed with lignocaine at 4 mg/kg (Lidocaine hydrochloride 2%, xylocaine, zyclus cadila). A volume of 10 mL was infiltrated at each of the T13, L1 and L2 spinal nerves, with an additional 10 mL administered below the transverse processes at L1, L2 and L3 in a fan-pattern using an 18-gauge needle.

2.5 Surgical procedure

Rumenotomy was performed without weingarth's ruminotomy set. A linear incision line approximately 15 cm in length was made on the skin using a sterile BP blade No.24 (Figure 2(a)). The incision was placed about 3 cm caudal and parallel to the last rib and 5 cm ventral to the transverse processes. The skin was detached from the subcutaneous fascia. The incision was extended through external oblique muscle, internal oblique muscle, transverse abdominal muscle along the directions of fibers followed by peritoneum, thereby opening the abdominal cavity. Hemostasis was achieved using homeostatic forceps and local infiltration of adrenaline.



(a) (b)
Figure 2: Surgical steps during rumenotomy (a) Rumen incision following isolation. (b) Exploration and evacuation of ruminal contents

The abdominal cavity was isolated from the rumen by packing with sterile drapes to avoid contamination. The rumen was exteriorized, secured with forceps and stay suture, and then incised (Figure 2(b)).

The contents were removed manually. Exploration of rumen and reticulum was performed using sterile artificial insemination gloves. The car key was successfully located and removed from the reticulum (Figure 3).



Figure 3: Retrieved car key from the rumen.

The rumen was closed with size 1-0 absorbable polyglycolic acid following double suturing method (Lembert's and Cushing's suture patterns) and repositioned into the abdominal cavity. The peritoneum and muscles was flushed with (Metronidazole 0.5% W/V, Metris, Otsuka pharmaceutical Pvt. Ltd) at 10mg /kg to prevent postoperative peritonitis and adhesion formation. Then the abdominal

muscle layers and skin were closed with size 1 absorbable polyglycolic acid following simple continuous sutures and interrupted cross mattress sutures respectively. The procedure was completed in approximately three hours, and strict asepsis were maintained throughout.

2.6 Post operative management

Postoperatively, antibiotic oxytetracycline (Nioxy-LA) was given at 10 mg/kg I/M, every 72 hours intervals for three doses to minimize the risk of secondary bacterial infection. Daily post-operative wound dressing using 5% povidone iodine and gentamicin (Gelimus cream) ointment application for seven days along with analgesic and antibiotic course as indicated. Weekly follow up of case was done by the team for one month.

3. RESULTS AND DISCUSSION

3.1 Results

The non-penetrating car key was freely located in the reticular floor and showed no evidence of reticular perforation, adhesion, abscess formation or localized peritonitis. The cow remained physiologically stable during the perioperative period. Rumen motility resumed by day one, with 3 contractions/2 minutes by day three. Milk yield decreased transiently by approximately 2 liters during the immediate postoperative period and returned to baseline by day seven. Feed intake and rumination were progressively restored. Follow up during day 30 postoperative showed complete wound healing without any dehiscence and complete clinical recovery with normal production.

3.2 Discussion

Most reported cases of metallic foreign body ingestion in cattle are presented with anorexia, pyrexia, reduced rumen motility, and decreased milk yield (Constable et al. 2017). In contrast, the present case was clinically normal at presentation, likely

reflecting the non-penetrating nature of the car key. This underscores the importance of proximity-based vehicle sensor activation, a novel indicator not previously documented. Diagnosis typically relies on case history, clinical symptoms, clinical examination, laboratory diagnosis, radiography and ultrasonography (Abu-seida and Al-Abbadi 2016).

The presence of foreign bodies in the rumen and reticulum hampers the absorption of volatile fatty acids, consequently leading to reduction in the rate of animal fattening (Igbokwe et al. 2003). The ingestion of non dietary metallic and non-metallic materials in ruminants is primarily associated with malnutrition and an unbalanced diet that may result in nutritional deficiencies resulting in pica and the ingestion of non-normal stuff (Ghurashi et al. 2009). Accumulation of indigestible foreign bodies in rumen interferes with absorption of feed and flow of ingesta (Negash et al. 2015). Retained foreign bodies may impair ruminal motility and predispose to traumatic reticuloperitonitis (Braun et al. 2018). In this case, no adhesion, peritonitis, and interference with ruminal functions were observed intraoperatively, highlighting that early intervention prevented inflammatory sequelae. Rapid restoration of rumen motility and milk production supports the rationale for early retrieval even in resource limited settings.

Preventive measures, including clean feeding areas, nutritional supplementation during feed shortages, and proper supervision during feeding are essential to reduce the risk of foreign body ingestion.

Fesseha H. (2020). Rumenotomy due to Metallic Foreign Bodies in Rumen of Adult Dairy Cow. *Biomedical Journal of Scientific & Technical Research*, 27(3). <https://doi.org/10.26717/BJSTR.2020.27.004509>

4. CONCLUSION

This case demonstrates that exploratory ruminotomy can be successfully performed in resource limited field settings using systemic field observation, enabling timely intervention and prompt restoration of production, underscoring its importance for animal welfare and farmer livelihood. Preventive husbandry and farmer awareness are essential to minimize future risk.

Limitation includes the single-case nature and focus on an automatic car key, restricting generalization. Future studies should evaluate standardized protocols, low-cost diagnostic tools, comparative outcomes with or without confirmatory diagnostic facilities, and preventive husbandry practices to improve field management of foreign body ingestion.

References

- Abu-seida A , and Al-Abbadi O. (2016). Recent Advances in the Management of Foreign Body Syndrome in Cattle and Buffaloes. *Pakistan Veterinary Journal*, 36(4) 385–393
- Braun U, Warislohner S, Gerspach C, Ohlerth S, and Nuss, K. (2018). Treatment of 503 cattle with traumatic reticuloperitonitis. *Acta Veterinaria Scandinavica*, 60(1), Article 55. <https://doi.org/10.1186/s13028-018-0410-8>
- Constable PD, Hinchcliff KW, Done SH, and Grünberg W. (2017). *Veterinary medicine: A textbook of the diseases of cattle, horses, sheep, pigs and goats* (11th ed.). Elsevier.
- Ghurashi MAH, Seri HI, Bakheit AH, and Ashwag EAM. (2009). Effect of surgical removal of foreign body from goat's rumen with special reference to the prevalence of foreign body in goats in southern Darfur. *Australian Journal of Basic*

- and Applied Sciences, 3, 664–668.
- Igbokwe IO, Kolo MY, and Egwu GO. (2003). Rumen impaction in sheep with indigestible foreign bodies in the semi-arid region of Nigeria. *Small Ruminant Research*, 49(2),141–146. [https://doi.org/10.1016/S0921-4488\(03\)00074-9](https://doi.org/10.1016/S0921-4488(03)00074-9)
- Negash S, Sibhat B, and Sheferaw D. (2015) .A postmortem study on indigestible foreign bodies in the rumen and reticulum of ruminants, eastern Ethiopia. *Onderstepoort Journal of Veterinary Research*, 82(1), 2-4.