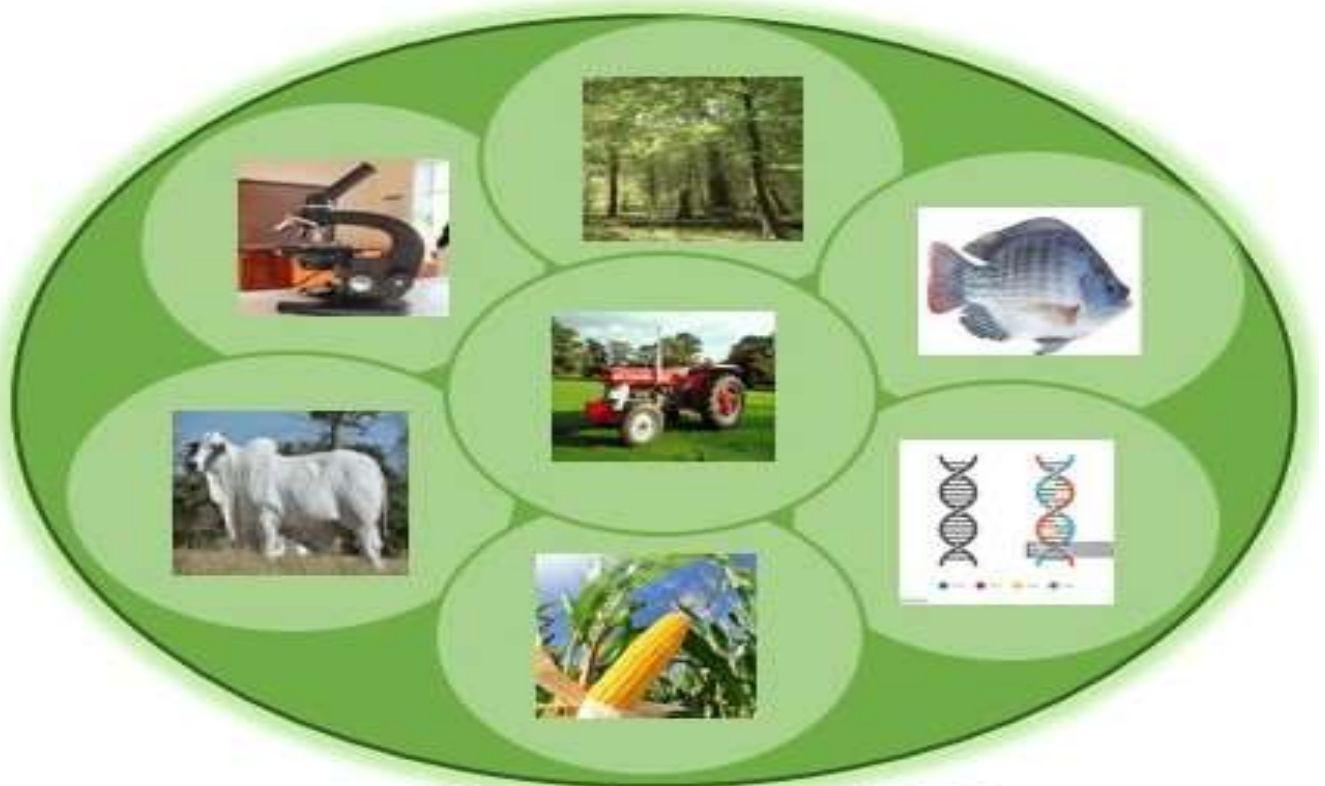




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CASE REPORT: RUMENOTOMY FOR CHRONIC RUMEN IMPACTION IN A 4-YEAR-OLD SOKOTO GUDALI COW – OUTCOME AND LESSONS LEARNED”

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ABSTRACT

This report describes the surgical management and postoperative outcome of chronic rumen impaction in a 4-year-old Sokoto Gudali cow. The animal was presented to the Large Animal Unit of the Veterinary Teaching Hospital, Usmanu Danfodiyo University, Sokoto, with a four-month history of inappetence, persistent standing, progressive weight loss, and intermittent bloat, which worsened three months postpartum. The animal was managed intensively in a herd and fed on wheat bran, rice bran, bean husk, and grasses. Physical examination revealed dullness, dyspnea, abdominal distension, bruxism, rumen stasis, and a firm mass in the left paralumbar region. Vital parameters indicated mild pyrexia and tachycardia. Hematological analysis revealed values within reference ranges, with mild eosinophilia. A tentative diagnosis of chronic bloat secondary to rumen impaction was made, and rumenotomy was performed. Intraoperative findings confirmed severe rumen impaction with compacted foreign materials. Although the surgical procedure and initial postoperative period were uneventful, complications developed by the third postoperative day, including persistent recumbency, hypothermia, and poor therapeutic response. Due to progressive clinical deterioration, the cow was humanely slaughtered. This case highlights the need for early recognition and prompt intervention in chronic rumen impaction, as delayed presentation with systemic compromise may undermines surgical success and worsen prognosis.

Keywords: Rumenotomy, Rumen impaction, Bloat, Sokoto Gudali, Case management

Introduction

Rumen impaction remains a major constraint in bovine health, particularly when animals consume low-quality, high-fiber diets with insufficient water often culminating in ruminal atony and systemic compromise (Radostits *et al.*, 2007). Recent abattoir surveillance in Sokoto revealed a remarkably high prevalence of rumen impaction approximately 27% of slaughtered ruminants attributable largely to ingestion of plastics,

rope, and other indigestible materials (Jimoh *et al.*, 2024). These environmental factors further underscore the role of poor feeding practices and environmental contamination in disease etiology (Singh *et al.*, 2020; Ibrahim *et al.*, 2014).

The Sokoto Gudali is an indigenous zebu breed well adapted to Nigeria's arid zones yet vulnerable to gastrointestinal disturbances under poor nutritional regimes (Tambuwal *et al.*, 2002). Notably, **recent case reports**

involving Sokoto Gudali calves have highlighted rumen impaction even in younger cohorts, further expanding its clinical relevance in this breed (Ahmad *et al.*, 2023). These challenges are further compounded by limited access to preventive veterinary services and low awareness of appropriate feeding strategies among livestock keepers.

Rumen impaction cases that fail to respond to medical management often require rumenotomy; a surgical intervention aimed at decompressing the rumen and manually removing the obstructing material (Fubini and Ducharme, 2017). While this procedure is routinely practiced in other cattle populations, there is a paucity of documented cases involving Sokoto Gudali cattle. To the best of our knowledge, few published reports have detailed the clinical course, surgical intervention, and postoperative outcome of chronic rumen impaction in this indigenous breed.

This case report describes the clinical evaluation, surgical management, and postoperative progression of chronic rumen impaction in a Sokoto Gudali cow. It highlights the critical importance of timely diagnosis, appropriate surgical planning, nutritional control, and intensive postoperative care. By documenting this case, we aim to contribute to the limited literature on surgical rumen impaction management in indigenous African cattle and provide insights that may inform clinical decisions in similar settings.

Case Presentation

A 4-year-old Sokoto Gudali cow was presented to the Large Animal Unit of the Veterinary Teaching Hospital, Usmanu Danfodiyo University, Sokoto. The owner reported a four-month history of reduced feed intake, weight loss, intermittent bloat, and

persistent standing, with worsening clinical signs observed three months postpartum. Temporary relief had previously been achieved through the use of a trocar and cannula, as well as administration of K-C Bloat, Epsom salt, Albendazole, Oxytetracycline, and multivitamins, four days prior to presentation by unknown. The cow was part of a semi-intensive herd consisting of two bulls and nine cows, and was fed a diet of wheat bran, rice bran, bean husk, and grasses. There was no history of vaccination.

Clinical Examination

The cow appeared dull but responsive, with moderate emaciation. Clinical findings were dyspnea, ruminal tympany, bruxism, and rumen stasis. A firm mass was palpable in the left paralumbar fossa. The vital parameters were as follows: temperature, 38.7°C; pulse rate, 89 beats per minute; and respiratory rate, 23 cycles per minute. The mucous membranes were pinkish but slightly dry, with a capillary refill time of 2 seconds. Dehydration was estimated at 6%, and the body condition score was 4 out of 9. The cow's body weight was estimated at 350 kg. Hematological evaluation showed values within normal limits: packed cell volume (PCV), 34.0%; hemoglobin (Hb), 11.3 g/dL; red blood cell count (RBC), $6.10 \times 10^6/\text{mm}^3$; and white blood cell count (WBC), $7.35 \times 10^3/\text{mm}^3$, with mild eosinophilia (4.0%). Based on the clinical findings and history, a tentative diagnosis of chronic rumen impaction was made, and a rumenotomy was planned and conducted for the patient.

Surgical Management

Feed was withheld for 24 hours prior to surgery. Presurgical parameters were within acceptable limits (temperature: 38.1°C; pulse: 83 bpm; respiratory rate: 24 cpm; mucous

membranes were pinkish; capillary refill time: 2 seconds). The surgery was performed with the animal in a standing position, restrained in a chute.

The surgical area was shaved and prepared aseptically using **Purit®** antiseptic (chlorhexidine gluconate B.P. 0.3% w/v, cetrimide B.P. 3% w/v; Saro LifeCare Limited, Lagos, Nigeria) for scrubbing, rinsed with methylated spirit (Binji Global Pharmaceutical Company, Sokoto, Nigeria), and subsequently disinfected with povidone-iodine (Iodine Tincture 2.6% w/v solution; Apacco Pharmaceutical Company Limited, Ogun, Nigeria). The area was draped in a rectangular pattern.

Local anesthesia was achieved by subcutaneous infiltration of 2% lignocaine hydrochloride (Lignocaine Injection B.P. 2.5%) in an inverted L-block pattern around the surgical site. A vertical skin incision was made on the left paralumbar fossa, followed by careful dissection through the subcutaneous tissues and muscle layers to expose the rumen. An incision was then made

into the rumen wall, allowing access to its contents. Approximately 18 kg of impacted foreign material was manually removed.

Following evacuation, the rumen was thoroughly lavage and closed using size 2 chromic catgut in a double-layer inverting suture pattern a Cushing pattern over sown with Lambert pattern. The muscle layers were closed using size 2 chromic catgut in a simple continuous pattern. The subcutaneous tissue was approximated with size 2 chromic catgut, and the skin was closed using size 2 nylon in a Ford interlocking suture pattern.

Postoperative medication included **STREPNOR®** (Procaine Penicillin G 200 mg + Dihydrostreptomycin 250 mg) at 20,000 IU/kg and 12.5 mg/kg intramuscularly respectively, administered intramuscularly; a multivitamin at 1 mL/10 kg intramuscularly; 2.5% Diclofenac sodium at 2.5 mg/kg intramuscularly for five days; and Epsom salt at 120 g/L of warm water administered orally as a single dose (stat). The surgical site was dressed daily with povidone-iodine.

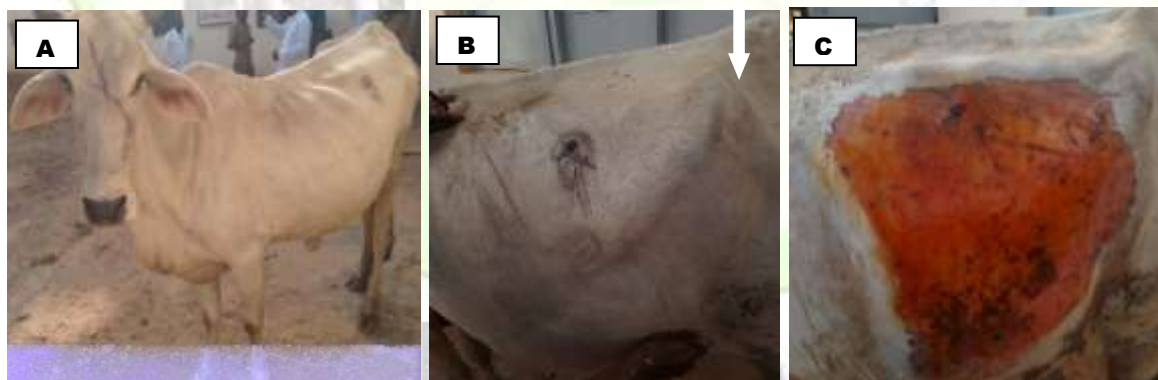




Figure 1: showing; patient on the day of presentation (A), left abdominal region where trocar and canula were earlier used on (B), aseptically prepared surgical area (C), surgical area draped with rectangular draping pattern (D), removed 18 kg impacted mass (E)



Figure 2: showing; rumen closure using Cushing oversewn with Lembert suture pattern (A), abdominal muscles apposition using simple continuous suture pattern (B), skin closure using Ford interlocking suture pattern with nylon (C), patient in the pen after surgery

Outcome and Follow-Up

On Day 1 post-surgery, the patient showed alertness with mild hypothermia (36.4°C). On Day 2, it was tachycardic (96 bpm), weak,

and required assistance to rise. By Day 3, the cow became recumbent and showed no improvement despite therapy. Hypothermia and weakness persisted. The animal was

humanely slaughtered due to poor prognosis based on the surgeon advice.

Discussion

Rumen impaction commonly results from chronic ingestion of low-quality fibrous feed lacking adequate roughage and water intake, often leading to ruminal atony, dehydration, and chronic bloat (Sa'idu *et al.*, 2018; Tsegay *et al.*, 2013). This condition is particularly prevalent in developing regions where agricultural by-products such as rice husk, bean husk, and straw are frequently used as cattle feed. Such materials are poorly digestible and, when not properly supplemented with effective roughage or water, predispose animals to impaction (Ibrahim *et al.*, 2014). In this case, the cow had prolonged access to such fibrous by-products with minimal quality forage and inconsistent access to water, all of which likely contributed to the impaction.

Previous studies have shown that inadequate dietary management and prolonged retention of indigestible materials significantly contribute to the pathogenesis of ruminal impaction (Misk *et al.*, 2003). While early medical intervention may offer temporary relief, chronic cases of rumen impaction often necessitate surgical rumenotomy for definitive treatment (Fubini & Ducharme, 2017). **A recent field-based report** described successful rumenotomy and therapeutic recovery in a Holstein Friesian cow under field conditions, reinforcing the feasibility of operative management even in resource-limited settings (Soni and Parihar 2022). However, surgical success is closely tied to early intervention, the extent of systemic compromise, and postoperative care (Tyagi and Singh, 2015).

In this case, the cow was presented late in the disease course with marked systemic exhaustion, dehydration, and advanced

ruminal distention. Although the rumenotomy was technically successful with complete removal of impacted material, the prognosis was compromised by the delay in presentation and the suspected accidental postoperative feeding of dry millet, which may have triggered recurrence of bloat or ileus. Similar complications have been documented in other studies where inappropriate postoperative nutrition or premature feeding exacerbated recovery challenges (Kumar *et al.*, 2012).

Hematological findings showed eosinophilia, which is typically associated with parasitic infestations, allergic responses, or tissue inflammation (Mohamed *et al.*, 2014; Radostits *et al.*, 2007). In the context of this case, eosinophilia may reflect a combination of parasitic burden, often endemic in extensively managed cattle, and mucosal irritation or immune stimulation due to prolonged exposure to coarse, indigestible material within the rumen. Chronic irritation of the gastrointestinal mucosa can elicit a sustained eosinophilic response, as reported in previous studies on ruminants exposed to irritant or allergenic feeds (Amin and Hassan, 2020). Therefore, the elevated eosinophil count may not only reflect systemic stress but also underlying parasitic or allergic components exacerbating the clinical picture. These events underscore the critical importance of individualized postoperative nutritional management, gradual refeeding protocols, and close monitoring for complications such as electrolyte imbalance or recurrent stasis. Moreover, intensive fluid therapy, anti-inflammatory support, and correction of acid-base disturbances should accompany surgical management, especially in cases with prolonged stasis or anorexia. This aligns with recent calls for integrated perioperative care in ruminants with chronic

gastrointestinal conditions (Radostits *et al.*, 2007).

Despite these insights, the absence of advanced diagnostic modalities such as rumen ultrasonography, full biochemical profiling; and rumen fluid analysis further limits comprehensive assessment of metabolic status and systemic involvement. Additionally, reliance on owner-reported feed history introduces the potential for recall bias, which may obscure critical contributing factors.

Preventing rumen impaction requires a multifaceted approach, including proper dietary formulation with sufficient high-quality roughage, restriction of low-nutritive fibrous by-products, and unrestricted access to clean water (Radostits *et al.*, 2007; Singh *et al.*, 2020). Prophylactic strategies such as the use of feed intake buffers, administration of rumen magnets in hardware-prone areas, effective waste disposal, and farmer education through targeted veterinary outreach are essential for sustainable prevention (Sharma and Kumar, 2006; Akinrinmade and Akinrnde, 2014). Early detection and prompt referral for surgical or medical intervention have also been shown to improve outcomes, particularly in resource-limited settings where advanced diagnostics and perioperative support may be delayed (Fubini and Ducharme, 2017; Sa'idu *et al.*, 2018).

Conclusion

This case underscores the importance of comprehensive clinical evaluation and timely surgical intervention in the management of chronic rumen impaction. The unfavorable outcome, despite successful rumenotomy, highlights the detrimental effects of delayed presentation, systemic exhaustion, and inadequate postoperative recovery. These findings emphasize the need for meticulous

postoperative care including nutritional regulation, fluid therapy, and intensive monitoring to optimize surgical outcomes. Furthermore, the case reinforces the importance of herd-level management strategies, early disease recognition, and timely veterinary referral. Future research should focus on identifying prognostic indicators, refining early diagnostic tools, and developing evidence-based perioperative protocols to improve clinical outcomes and reduce mortality associated with bovine rumen impaction.

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