

Clinico-Therapeutic Management of Reticular Abscess due to Ruminal Acidosis in Jaffarabadi Buffalo – A Report of Four Cases

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Reticular abscesses in buffaloes are a frequent complication of traumatic reticuloperitonitis or foreign body syndrome, primarily caused by the anatomical structure and function of the reticulum (Athar *et al.*, 2010). These abscesses often result from foreign body penetration or bacterial infections, causing severe inflammation that can lead to toxemia and heart failure if left untreated (Abu-Seida and Al-Abbadi, 2016). In addition to trauma, prolonged ruminal acidosis, often due to improper dietary management, is a significant contributing factor (Sharma *et al.*, 2015). When ruminants consume high amounts of rapidly fermentable carbohydrates, such as grains, subacute ruminal acidosis (SARA) can occur, leading to a drop in ruminal pH and weakening of the rumen and reticulum walls, making them more susceptible to bacterial infections and abscess formation (Caldwell *et al.*, 2011). This study documents the clinico-therapeutic management of reticular abscesses due to ruminal acidosis in Jaffarabadi buffaloes.

CASE HISTORY AND OBSERVATIONS

In this study, four lactating Jaffarabadi buffaloes, aged 5 to 8 years, showing signs of anorexia, persistent bloat, fever, and decreased milk yield, abdominal pain (positive grunt test), reluctant movement, and weight loss etc, were presented at Veterinary Clinical Complex of the College in Junagadh (India). Out of 4 animals, three were parturied recently (2-3 months) and one was 6 months pregnant. The detailed history revealed that the buffaloes were fed diets rich in grains with limited fiber content leading to suspected episodes of ruminal acidosis prior to the onset of abscess formation. On clinical examination, all 4 animals had persistent bloat, suspended ruminal motility, scanty faeces, fever, emaciation, decreased milk yield, and 2 each showed tachypnoea and tachycardia. The cases were also marked by ruminal acidosis, characterized by reduced ruminal pH below 5.5.

The ferroscope examination was done in a standing position and lateral radiographs were taken to confirm the presence of foreign bodies, if any, but there was no evidence of foreign body found by either technique. Each buffalo underwent a high frequency ultrasound-guided diagnostic

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imaging, which could locate and characterize the abscess in the right-side thoracic region. An echogenic capsule of varying thickness involving a hypoechogenic to moderately echogenic centre with various sizes was noted at the right-side 6th intercostals space (ICS) near the sternum over the thickened reticular wall indicating a reticular abscess (Fig. 1). A hyperechoic thickened mass was observed through the ventral side near the sternum at the rumen reticular junction (Fig. 2). In addition, the haematological analysis of affected buffaloes revealed elevated haemoglobin, PCV, TEC, TLC, and neutrophilia, with decrease in lymphocytes per cent (Table 1). It was decided to treat these cases with ultrasound-guided reticulocentesis.

TREATMENT AND DISCUSSION

The animals were restrained in standing position and the abscesses were drained by insertion of trocar and cannula under ultrasonographic guidance at the 6th ICS. Post-drainage, the abscess cavities were flushed with 5% Povidone-iodine solution diluted in 200 mL normal saline. The volumes of

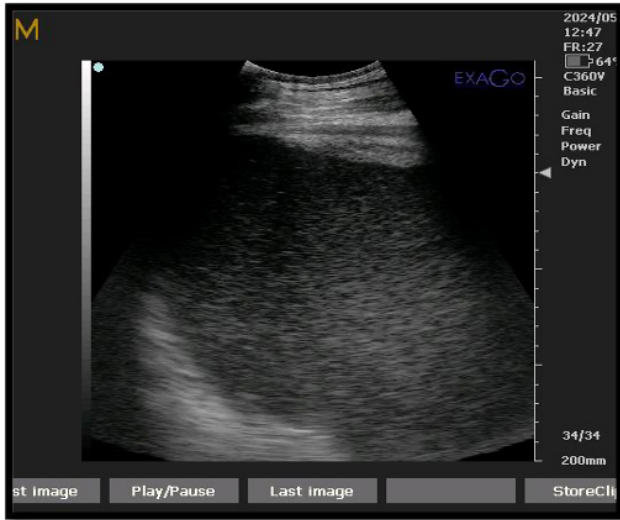


Fig. 1: USG of abscess mass at thoracic approach right side 6th ICS



Fig. 2: USG of abscess mass through sternal approach ventral side at sternum

Table 1: Haematological parameters of buffaloes with reticular abscesses before and after (5th day) treatment

Parameters	Case 1		Case 2		Case 3		Case 4		Reference range
	Before	After	Before	After	Before	After	Before	After	
Haemoglobin (g/dL)	11.9	11.5	7.8	9.8	8.9	10.2	9.8	10.8	10-14
PCV (%)	32.4	33.8	36.6	30.5	32.7	31.8	26.7	34.0	30-40
TEC ($\times 10^6/\mu\text{L}$)	5.12	5.9	6.7	5.6	7.6	5.9	5.4	6.1	5.5-8.5
MCV (fL)	63.3	57.3	54.6	54.5	43.0	53.9	49.4	52.5	42-58
MCH (pg)	23.2	19.5	11.6	17.5	11.71	17.3	18.2	17.7	13-20
MCHC (g/dL)	36.7	33.1	21.3	31.8	27.2	32.2	36.7	33.0	30-36
Platelets ($\times 10^5/\mu\text{L}$)	2.7	3.3	3.4	2.9	1.9	3.4	2.4	3.5	2-10
TLC ($\times 10^3/\mu\text{L}$)	16.5	11.4	12.8	11.8	17.8	10.9	13.4	10.6	6-12
Neutrophils (%)	68	42	72	40	44	37	27	33	30-40
Lymphocytes (%)	23	53	19	52	48	55	65	60	50-65

pus drained from the abscesses in each buffalo through reticulocentesis ranged from 800 mL to 6.6 L across the 4 cases (Fig. 3). Postoperatively, broad-spectrum antibiotic, anti-inflammatory drug, multivitamins and alkalizer were administered. In addition, supportive fluid therapy was also given to restore hydration and maintain electrolyte balance. In addition to the immediate treatment of the abscess, dietary correction was initiated to address the underlying cause of SARA. The diet was altered to include more fibrous forages and reduce the intake of fermentable carbohydrates. This was aimed to restore the ruminal pH balance and prevent further episodes of acidosis, which could exacerbate the condition or lead to the formation of new abscesses. All buffaloes showed significant clinical improvement within five days post-procedure, highlighting the effectiveness of early diagnosis, ultrasonography guided intervention and postoperative management. This study emphasizes the importance of dietary management in preventing acidosis-related abscesses and the utility of ultrasonography and reticulocentesis in effective treatment.



Fig. 3: Drainage of reticular abscess through reticulocentesis.

Reticular abscess is mostly caused by ingestion of sharp foreign body, as all four cases had history of grazing (Makhdoomi *et al.*, 2018). The most common clinical signs of

reticular abscesses noticed in the present study, *viz.*, anorexia, decreased milk production, fever, ruminal atony, tympany, abdominal pain, arched back, and tense abdomen, were in agreement with Chetan *et al.*, (2024). The relationship between ruminal acidosis and reticular abscesses is well-documented. Chronic ruminal acidosis damages the ruminal epithelium, reducing its ability to serve as a barrier against microbial invasion. As bacteria enter the reticular wall, they can cause abscess formation, as was evident in these cases (Plaizier *et al.*, 2008). Since Jaffarabadi buffaloes are frequently fed high-energy diets for increased milk production, this condition is more prevalent. Hence, preventive dietary management, with a focus on fiber-rich diets and proper feed balancing, is crucial for reducing the incidence of ruminal acidosis and subsequent reticular abscesses (Garrett *et al.*, 1999; Enemark, 2008).

Athar *et al.* (2010) reported elevated total leukocyte counts, neutrophilia, and normal mean haemoglobin and PCV values in bovines with reticular abscesses. Similar findings were recorded in the present study. This might be due to dehydration and the chronic condition of the cases. In the present study, no changes in the silhouette of the reticulum were observed on radiography, likely due to the insufficient density of foreign bodies and the increased thickness of the thoracic or abdominal wall in buffaloes. Similarly, Saini *et al.* (2005) and Kumar *et al.* (2008) reported non-visualization of reticular abscesses through radiography, and Hussain *et al.* (2024) concluded that radiography is not a reliable tool for diagnosing reticular abscesses.

In this study, ultrasonography (USG) effectively diagnosed and localized reticular abscesses in buffaloes, with abscesses detected at the right 6th intercostal space and near the sternum. The imaging showed an echogenic capsule with a hypoechogenic centre, confirming the presence of the abscesses. Ultrasonography is less stressful and more accurate than radiography for diagnosing reticular abscesses in buffaloes. It also provides a better characterization of abscess contents, which radiography cannot achieve. Ultrasonography is less stressful and more accurate than radiography in the diagnosis of diaphragmatic hernia, reticular abscess, and reticuloperitonitis/adhesions (Abd El Razik *et al.*, 2023). Ultrasonography guided intervention proved to be an effective and minimally invasive technique for managing reticular abscesses in all four cases, leading to rapid clinical improvement and resolution of systemic infection. Pre-procedure leucocytosis and neutrophilia confirmed active infection, which normalized post-procedure (Table 1), indicating successful infection resolution.

In general, apart from clinical signs and haematology, ultrasonography played a key role in diagnosing and localizing the reticular abscesses, showing superior results over radiography. The study further demonstrates that ultrasonography guided reticulocentesis is an effective and less invasive treatment option, reducing the need for riskier surgeries such as rumenotomy. The findings underscore

the importance of early diagnosis and timely intervention in managing reticular abscesses, leading to faster recovery and minimizing economic losses in valuable livestock like Jaffarabadi buffaloes.

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