



Research Article

SUCCESSFUL SURGICAL MANAGEMENT OF DIAPHRAGMATIC HERNIA IN A BUFFALO HEIFER UNDER DISSOCIATIVE ANESTHESIA

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Received: April 03, 2022; Revised: April 26, 2022; Accepted: April 27, 2022; Published: April 30, 2022

Abstract: The two-year-old non-descript buffalo heifer was presented to Department of Veterinary Surgery and Radiology, Veterinary College, Hassan with the history of dyspnoea, recurrent bloat, anorectic, passing scanty pasty faecal matter and suspended rumination for one month. Diagnosis was done by history, clinical findings, on auscultation abnormal heart sound and reticular sounds at 4th and 5th intercostal space and it was confirmed as biphasic contraction of reticulum near the heart in ultrasonography. The blood examination revealed leucocytosis, exploratory laparotomy revealed the herniation of the part of reticulum into the thoracic cavity. Hernial ring was around four fingers (6-7cms). Lapro-Rumenotomy was performed to evacuate the contents of the rumen one day before the correction of the diaphragmatic hernia. The surgical correction of the reticulocele was performed under dissociative anaesthesia using combination of inj. Butorphanol @ 0.1 mg/kg B.Wt, inj Ketamine @ 2 mg/kg B.Wt, inj Diazepam @ 0.2 mg/kg B.Wt intravenously for induction and was maintained using inj Ketamine @ 6 mg/kg B.Wt and inj Diazepam @ 0.3 mg/kg B.Wt at continuous rate of infusion and local anaesthetic using inj 2 % Lignocaine. Herniorrhaphy was performed post xiphoid ventral midline approach under standard surgical procedure and tight abdominal bandage to prevent the incisional hernia.

Keywords: Buffalo heifer, Diaphragmatic hernia, Dissociative anaesthesia and Herniorrhaphy

Citation: Manjunatha D.R., *et al.*, (2022) Successful Surgical Management of Diaphragmatic Hernia in a Buffalo Heifer under Dissociative Anesthesia. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 4, pp.- 11276-11277.

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Academic Editor / Reviewer: Dr Lawal Mohammad Anka, Mangesh P. Jadhav

Introduction

Diaphragmatic hernia (DH) is a serious thoraco digestive disorder in which a part abdominal viscera mainly "reticulum" passed into the thoracic cavity through a congenital or acquired opening in the diaphragm causing chronic recurrent ruminal tympany, anorexia and displacement of the heart [1]. Buffaloes are susceptible to DH than other ruminant species and this due to the anatomical differences of buffalo's diaphragm. A relatively small tendinous portion of the diaphragm resulting in innate weakness, making this species more prone to such condition [2]. Diaphragmatic hernia has a wide range of clinical signs depending on the size and the type of viscera herniated [3].

Sharp foreign bodies are incriminated as the main cause of DH in cattle and buffalo. As it penetrates the diaphragm induce diaphragmatitis, weakness and diaphragmatic rupture which in turn, leads to herniation of abdominal viscera (mainly a segment of the reticulum, sometimes abomasum) into the thoracic cavity resulting in DH. Diaphragmatic hernia is a devastating problem as it causes a high economic loss especially when there is no either medical or surgical treatment for this condition. The animals showed general signs of indigestion including partial or complete anorexia, ruminal recurrent tympany, scanty faeces, reduced milk production and atony of rumen with suspended rumination which are considered general signs in buffaloes with DH and other many digestive disturbances [4].

Materials and methods

Two-year-old non-descript buffalo heifer was presented to Department of Veterinary Surgery and Radiology, Veterinary College, Hassan with the history of

recurrent tympany [Fig-1], anorectic, passing scanty pasty faeces and suspended rumination. Symptomatic treatment was ineffective, animal was unthrifty, debilitated and dehydrated, clinical examination revealed normal rectal temperature, dyspnoea and bloat. On auscultation abnormal heart sounds and reticular sounds were observed at 4th and 5th intercostal space. The values of haematological parameters revealed leucocytosis, decreased haemoglobin. Ultrasonographic examination at 4th and 5th intercostal space revealed heart beats and biphasic contraction of reticulum in thoracic cavity [Fig-2].

Treatment

Exploratory laparo-rumenotomy [Fig-3], in standing position under paravertebral nerve block was performed to remove the contents of rumen to reduce pressure on the thoracic cavity. On examination reticular hernia was seen through right portion of diaphragm and heart beats was also observed. The hernial ring was about four fingers (6-7cm) [Fig-4]. Diaphragmatic herniorrhaphy [Fig-5] was done 48 hours later through ventral midline post xiphoid approach under dissociative anaesthesia using combination of inj. Butorphanol @ 0.1 mg/kg B.Wt, inj Ketamine @ 2 mg/kg B.Wt, inj Diazepam @ 0.2mg/kg B.Wt intravenously for induction and was maintained using inj Ketamine @ 6 mg/kg/B.Wt/hr and inj Diazepam @ 0.3 mg/kg B.Wt/hr in continuous rate of infusion intravenously and local anaesthesia was achieved using inj 2 % Lignocaine at the surgical site. After pre-operative antibiotic and analgesic animal was restrained in dorsal recumbency.



Fig-1 Ruminal tympany

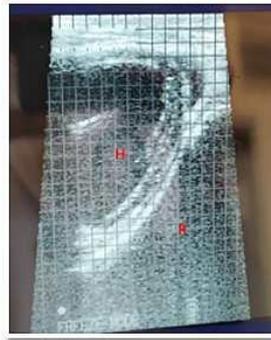


Fig-2 Ultrasound of 4th and 5th intercostal space showing heart and reticulum



Fig-3 Exploratory ruminotomy

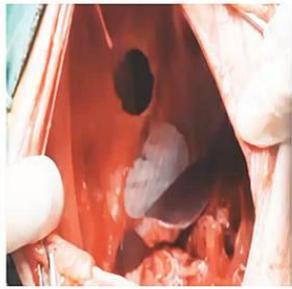


Fig-4 Hernial ring on tendinous portion of diaphragm

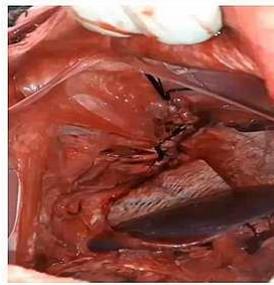


Fig-5 Herniorrhaphy



Fig-6 Follow up after 5th day

The mid ventral incision was made on the post xiphoid region, the hernial ring was palpated and all adhesions with reticulum were freed cautiously. The reticulum was reposed back to abdominal cavity. The hernial ring was closed with continuous lock stitch pattern using silk No.2, linea alba was sutured by cross mattress using silk No.2 and skin was sutured with silk No.2. Negative pressure on both the sides of thoracic cavity was achieved using suction pump. Dressing was done and tight abdominal bandage was made to prevent the incisional hernia. Post operatively maintained under fluid therapy and antibiotic for 7 days, analgesic for 3 days and sutures were removed after 12 days.

Results and discussion

DH is a common devastating problem in buffaloes, as it causes a high economic loss especially when it was not either medical or surgical treatment [4]. Diaphragmatic hernia is considered as a serious thoraco-abdominal disorder among buffaloes compared with other ruminant species. Higher prevalence of DH in buffaloes versus relatively lower prevalence in cows and this may be attributed to the lesser collagen content, elasticity and vascularity of the buffalo diaphragm [2]. The duration of illness, size and location of the diaphragmatic tear and the amount of compromised viscera play a significant role in the prognosis of DH [5]. The diaphragmatic hernia in a buffalo heifer was successfully diagnosed by history, clinical examination, and ultrasonography it is in accordance with Singh *et al.*, 2006 [2] and Kelmer *et al.*, 2008[3]. Present case was successfully surgically managed with herniorrhaphy without intermittent positive pressure ventilator, Under Dissociative anaesthesia in combination of diazepam, butorphanol and ketamine resulted in good muscle relaxation, it was safer and faster recovery. Animal recovered uneventfully.

Conclusion

DH is a common problem in buffaloes compared with other ruminant species, thorough history, medical evaluation is needed for the diagnosis. Ultrasonography may be an accurate tool for confirmatory diagnosis of DH. Selection of the anaesthetic protocol for the surgery plays very important role, fastness of the surgery and maintaining of negative pressure by inserting 16G needle at intercostal space and suction pump. Surgical correction without intermittent positive pressure ventilator resulted in successful recovery of the animal without any complication.

Application of research: Successful surgical management of diaphragmatic hernia in a buffalo heifer under dissociative anesthesia

Research Category: Veterinary Surgery and Radiology

Acknowledgement / Funding: Authors are thankful to Department of Veterinary Surgery and Radiology, Veterinary College, Hassan, 573202, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, 585401, India

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Research project name or number: Clinical case report

Author Contributions: All authors equally contributed

Author statement: All authors read, reviewed, agreed and approved the final manuscript. Note-All authors agreed that- Written informed consent was obtained from all participants prior to publish / enrolment

Study area / Sample Collection: Department of Veterinary Surgery and Radiology, Veterinary College, Hassan, 573202

Breed name: Buffalo

Conflict of Interest: None declared

Ethical approval: Ethical approval taken from Department of Veterinary Surgery and Radiology, Veterinary College, Hassan, 573202, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, 585401, Karnataka, India

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