

# Diagnosis and Surgical Management of Oesophageal Diverticulum in a Heifer

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## How to cite this paper:

Velavan, A., Sivashankar, R., Gayathri, K., & Pandiyan, R. (2021). **Diagnosis and Surgical Therapy of Oesophageal Diverticulum in a Heifer.** *International Journal of Livestock Research*, 11(5), 48-52.

<https://dx.doi.org/10.5455/ijlr.20201123081708>

**Received** : Dec 17, 2020

**Accepted** : Mar 09, 2021

**Published** : May 31, 2021

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## Abstract

*A three-year-old Holstein Friesian crossbred heifer was referred with the history of inappetence, drooling and improper rumination since a week. A systematic physical examination followed by a sonogram and survey and contrast (Barium) oesophagram was done for a confirmative diagnosis. The results of clinical examination and radiography helped to confirm the diagnosis of oesophageal diverticulum. Surgical management of the acquired condition was successfully performed and shortly post-operative, the patient recouped completely.*

**Keywords:** Barium, Contrast Radiography, Heifer, Oesophageal Diverticulum, Oesophagram

## Introduction

A relatively uncommon or rare disorder of the digestive system in bovines is the oesophageal diverticulum (Desai *et al.*, 2013). An outpouching of the mucosa is found in oesophageal diverticulum (Morgan, 1965). The case had been referred for expert diagnosis to the Large Animal Surgery out-patient unit of the Veterinary teaching hospital of Madras Veterinary College, Chennai. Clinical examination, survey and contrast radiographs as well as a sonogram of the cervical region confirmed the diagnosis as oesophageal diverticulum. Accurate diagnosis of an acquired oesophageal diverticulum in a heifer and its successful surgical management is reported here.

## Clinical Findings and Diagnosis

A three-year-old Holstein-Friesian crossbred heifer was brought to the Large Animal Surgery Out- Patient Unit, Madras Veterinary College with the history of inappetence, constant drooling of saliva and feed with mucous from mouth along with improper rumination since past ten days. The animal was mostly let out to graze in the fields. The dung was semi-solid, mud brown with mucoid coating. On clinical examination, all vital parameters were found to be within normal limits. An obvious swelling was seen in the left caudal ventrolateral cervical region. No pain was evinced on palpation of the region, but the animal had difficulty in flexing her head. The owners had been providing a raised platform for feeding grass and concentrate since past four days and the animal seemed to have a good appetite irrespective of the swelling and subsequent discomfort in the neck. A survey radiograph revealed a radiopaque pouch of around 18cm x 7cm ventral to the mandible and on left lateral lower cervical side (Fig. 1 and Fig. 2).



**Figure 1:** Plain cranial cervical lateral radiograph



**Figure 2:** Plain caudal cervical lateral radiograph

To obtain a clear definition, a barium oesophagram was performed by administering a 300ml of Barium swallow to the patient. The diagnosis was confirmed by the stasis of the contrast material in the ventral pouch thereby confirming an oesophageal diverticulum (Fig. 3-4-5). Radiographs and sonograms neither revealed any radio-opaque foreign body nor any intra/extra mural masses.



**Figure 3:** Contrast radiograph: cervical lateral



**Figure 4:** Barium swallow: caudal cervical lateral



**Figure 5:** Barium oesophagram: caudal cervical lateral view

Ultrasonography revealed oesophageal diverticulum with fluid and hyperechoic contents in the left caudal cervical region. Following stabilisation of the patient with parenteral antibiotics, isotonic intravenous fluids and rest from grazing, surgical correction was resorted to.

### **Surgical Management**

Pre-operatively the animal was fasted for 48 hours and administered Ringers lactate 1500 ml and Normal Saline 2500 ml intravenously. The animal was sedated with xylazine hydrochloride 0.01 mg/kg body weight intramuscular (Abrahamsen, 2013) and surgical site on ventral neck region was prepared for aseptic surgery. The animal was restrained in standing posture. Analgesia was achieved by using Lignocaine 2% by local infiltration. A transverse incision was made in the skin of the lower, dependent cervical part parallel and over the swelling between the trachea and sternocephalicus muscle (Fig. 6-7). The oesophagus was exposed and a sac like protrusion exteriorised (Fig. 8). Then longitudinal incision was made directly on the mass and the liquid contents were removed (Fig. 9-10). A stomach tube was passed through the oesophagus and then diverticulum was grasped with Halsted forceps and a non-crushing clamp was placed closer to cervical region. The diverticulum was then resected by incising between the clamp and oesophagus. The oesophagus was thoroughly lavaged with normal saline and metronidazole solutions (Fig. 11). The oesophageal incision was opposed with a double layer suture pattern; the mucosa was closed with continuous sutures and sub mucosa and muscularis were closed with 1-0 polyglycolic acid (Fig. 12). The stomach tube was removed and skin apposed in a cruciate pattern using polyamide-1. The suture line was dressed with povidone iodine ointment and bandaged over lightly.



**Figure 6:** Site of incision- left lateral neck- aseptically prepared surgical site



**Figure 7:** Oesophageal diverticulum being exteriorised



**Figure 8:** The oesophageal diverticulum -caudal cervical oesophagus with diverticulum



**Figure 9:** Opening up the diverticulum



**Figure 10:** No foreign body or obstructions found within



**Figure 11:** Oesophagus lavaged, cleaned up and diverticulum resected



**Figure 12:** Post resection of diverticulum, closure: suturing up

Post-operatively animal was given Inj. Streptopenicillin (Zydus) @ 5g and Melonex® (Intas) 15 ml intramuscularly for 7 days. Oral feeding was withheld and animal was maintained with Dextrose normal saline 3L, Normal saline 3L and Ringer lactate 3L daily for 3 days. The animal given a cud transplant and bran-concentrate mixture from the 4<sup>th</sup> day onward and chopped green grass and dry fodder, each 1kg daily. The animal was able to flex head and graze or feed normally with normal rumination restored. Hence, no spillage of feed or salivation was noticed after surgery. The sutures were removed on the 12<sup>th</sup> post-operative day and animal recovered uneventfully. No complications were recorded during the recovery phase.

## Discussion

Disorders of the oesophagus have been documented in literature to be congenital rarely and acquired more commonly, other than acute foreign body obstruction or choke which have been reported in dairy cattle (Blood *et al.*, 1979 and Fox, 1980). The condition of an oesophageal diverticulum, mostly by acquired causes relating to

trauma or foreign body or other lesser-known reasons, has not been very commonly reported in the Veterinary practice or literature (Aanes, 1976). An oesophageal diverticulum is detailed in literature to be a sac like protrusion of the oesophageal mucosa through any defect found in the muscular layer (Kasari, 1984). A diverticulum, mostly of pulsion type, may be formed by intraluminal pressure exerted by a foreign body obstructing the oesophagus which could lead to rupture of muscle fibers (Tyagi and Singh, 2002). The primary cause is often reportedly unknown, however trauma including cervical injuries and foreign bodies have been suspected in most cases (Aanes, 1976 and Desai *et al.*, 2013). In this case too the trauma was suspected to have been inflicted by a foreign body though none could be obviously recovered. The heifer in this case was also let free to graze in fields and the streets, risking her exposure to inappropriately swallow inedible traumatic objects or foreign bodies. A survey radiograph of the lateral cervical region followed by a barium oesophagram can explicitly reveal the extent and content of the oesophageal diverticulum in cows (Singh and Nigam, 1980). This was performed in this case too which helped elicit the presence of a caudal cervical oesophageal diverticulum and reaffirmed with contrast radiography.

## Conclusion

The significance of an accurate diagnosis in treatment is emphasised in this case which was achieved with the barium contrast radiogram. This helped describe and diagnose the oesophageal diverticulum and the etiopathology behind the case. An appropriate diagnostic method and surgical intervention helped in saving the life of the dairy animal who was otherwise suffering from being unable to feed properly. Thus, a rare case of oesophageal diverticulum in a dairy animal was successfully managed.

## Conflict of Interests

There is no conflict of interest.

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## References

1. Aanes, W. A. (1976). The diagnosis and surgical repair of diverticulum of the oesophagus. *Proceedings of the American Association of Equine Practitioners*, 21, 211-22.
2. Abrahamsen, E.J. (2013). Chemical restraint and injectable anesthesia of ruminants. *Veterinary Clinics of North America: Food Animal Practice*, 29,209-227.
3. Blood, D.C., Henderson, J.A. and Radostits, O.M. (1979). Diseases of pharynx and esophagus In: *Veterinary Medicine*. London: Bailliere Tindall. pp. 209-214.
4. Desai, B.V., Dhuri, R. B. and Parab, P. R. (2013). Surgical Management of Oesophageal Diverticulum in a Cow. *Intas Polivet*, 14 (1), 49-50.
5. Fox, F.H. (1980). The Oesophagus, stomach, intestines and peritoneum In: Amstutz, H. E. *Bovine Medicine and Surgery*. 2<sup>nd</sup> ed. Santa Barbara, California: American Veterinary Publications. pp. 659-692.
6. Kasari, T. R. (1984). Dilatation of the Lower Cervical Oesophagus in a Cow. *Canadian Veterinary Journal*, 25, 177-179.
7. Morgan, J.P. (1965). Esophageal Obstruction and Dilatation in a Cow. *Journal of American Veterinary Medical Association*, 147,411-12.
8. Singh, A.P. and Nigam, J.M. (1980). Radiography of Bovine Esophageal Disorders. *Modern Veterinary Practice*, 61, 867-69.
9. Tyagi, R.P.S. and Singh, J. (2002). The Digestive System. In: *Ruminant Surgery*. New Delhi: CBS Publication. pp. 183-224.

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