

VERMINOUS ASPIRATION PNEUMONIA IN A BUFFALO

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ABSTRACT

Generally, aspiration of fluids, ruminal contents or foreign material into the upper respiratory tract, bronchi and lungs lead to aspiration pneumonia in bovines. An adult female Murrah buffalo was presented for postmortem examination. Complete blood count examination of live animal revealed leucocytosis with shift to left. On the basis of gross and microscopical lesions, this case was concluded as aspiration pneumonia as a result of aspiration of regurgitated ruminal contents along with mature amphistome into the respiratory tract and subsequent edema, pneumonia, asphyxia and death.

Keywords: *Bubalus bubalis*, buffaloes, amphistome, bloat, aspiration pneumonia, asphyxia

foreign material in the upper respiratory tract and lungs as a result of inhalation (Shakespeare, 2012). In animals, unlike humans, bronchopneumonia is the most common type of pneumonia and marked as consolidation of cranioventral lung lobes (Zachery, 2017). It can be classified based on type of etiology like bacterial, viral, protozoal, aspiration, allergy etc. Aspiration pneumonia occurs due to the broncho aspiration of any feed or gastric contents or can be due to improper drenching of medicines. Any cause of dysphagia or regurgitation can lead to aspiration pneumonia (Jubb and Kennedy, 2007). Prognosis can be guarded to poor. Increased respiratory rate, change in respiratory pattern, sneezing, coughing and abnormal respiratory sounds are the clinical signs observed in animals affected by aspiration pneumonia.

CASE HISTORY

An adult female Murrah buffalo was presented to the Veterinary Dispensary. The major reported complaints were that animal appeared dull, depressed, showed severe respiratory distress

INTRODUCTION

In bovines, aspiration pneumonia is mainly infectious pneumonia. Aspiration pneumonia is referred as the presence of ruminal contents or

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and reluctant to move since two days. There was salivation mixed with greenish watery ruminal contents. Animal was treated symptomatically and blood smear and whole blood samples have been collected for examination. After a day the animal developed a bloat, showed subnormal temperature and collapsed. Animals have been brought to the Department of Veterinary Pathology, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University for postmortem examination.

RESULTS

Haematology

The peripheral blood smear examination did not reveal any blood parasites. However, in complete blood count (CBC) analysis, total leukocyte count was increased as $20.36 \times 10^3 / \mu\text{L}$ (Ref. $4.0\text{-}12 \times 10^3 / \mu\text{L}$). There was an absolute increase in segmented neutrophil count of $14.23 \times 10^3 / \mu\text{L}$ (Ref. $1.5\text{-}5.0 \times 10^3 / \mu\text{L}$) and relative band neutrophils of $0.57 \times 10^3 / \mu\text{L}$ (Ref. $0.0\text{-}0.19 \times 10^3 / \mu\text{L}$). Other CBC values were within the normal range. These findings suggested that there was a severe shift to left change in response to severe inflammatory condition of acute nature.

Necropsy examination

External examination of the carcass revealed there was oozing out of ruminal contents along with numerous amphistome worms from oral cavity. Internal detailed necropsy revealed the following findings. Rumen engorged with partially digested greenish fibrous feed materials with turbid greenish fluid and foul-smelling gas. Numerous mature amphistome worms were present in the fore stomach (Figure 1) as well as in bile duct and

gall bladder. Peritoneal cavity contains around 2.5 liters of turbid brownish fluid. Proximal duodenal mucosa showed thickening and patchy hemorrhagic areas. Lungs revealed diffuse congestion and severe edema. Cranioventral lung lobes revealed consolidation. The trachea and bronchi contained moderate quantity of white frothy fluid and a few live amphistome worms (Figure 2). Tracheal mucosa revealed multiple streaks of hemorrhage (Figure 3). Live amphistome worms were also found in the esophagus (Figure 4). Epicardium showed multiple petechiae on the surface.

DISCUSSION

Amphistome or conical flukes are very common in ruminants. Young / immature forms are found mainly in the duodenum which is responsible for causing acute severe disease. After maturation they migrate to the bile duct or rumen and not of much clinical significance. In case of heavy infection there can be a drop in production (Constable *et al.*, 2017). Studies suggested that biliary amphistomosis are common and prevalent in buffaloes (Thangapandiyani *et al.*, 2014). In buffaloes, length and diameter of bile duct were greatly enlarged but in cattle tissue reactions include sclerosis, calcification, and proliferation of mucosa (Cheema *et al.*, 1997).

Aspiration pneumonia may be resulted from the inhalation of abnormal material into trachea, bronchi, and lung alveoli. In adult bovines, aspiration of huge quantity of regurgitated contents could lead to sudden death due to mechanical asphyxiation (Shakespeare, 2012), which could be attributed to the large size of the rumen and the amount that could be regurgitated in a single time. The highly irritating nature of the ruminal contents



Figure 1. Mature amphistome worms in the rumen.

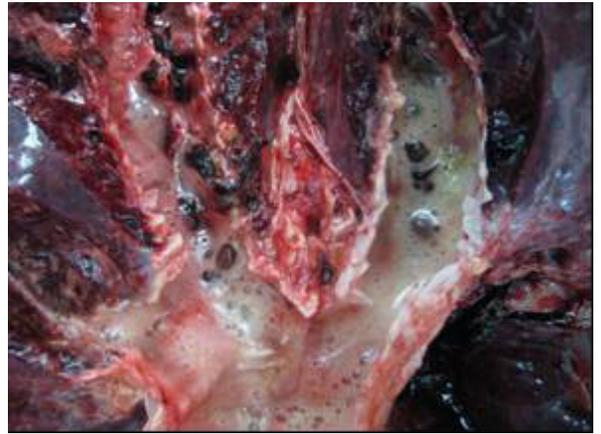


Figure 2. Live worms and froth in trachea and bronchi.



Figure 3. Trachea - Multiple streaks of hemorrhages.



Figure 4. Esophagus. Live amphistomes frothy trachea and bronch.

led to the development of bronchopneumonia with fibrinous and necrotic features. The animals might have responded to treatment, if they were in initial and early stage of infection or with less volume of the aspirated material which could not cause immediate death (Dhillon *et al.*, 2020). Anatomical differences in the bovine lung make it more prone to the pneumonic changes. Bovines lack collateral ventilation. The right cranial lung lobe is more affected by inhaled aspirate as they

are supplied by bronchus that is emerging before the tracheal bifurcation. Most common cause of aspiration pneumonia is faulty drenching of medications. Even secondary aspiration pneumonia associated with megaesophagus which is a rare condition in ruminants also reported (Mohammed Ismail *et al.*, 2019). It also occurred as a complication of phytobezoar which obstructed reticulomassal orifice which leads to increased ruminal contractions, regurgitation, and aspiration

pneumonia (Veeraiah *et al.*, 2008).

In the present case, the mature live amphistome worms were found in the trachea and bronchi till the end portion could be due to the aspiration of the regurgitated ruminal fluid contents along with the worms. Severe diffuse lung edema and congestion could be due to the irritation and haemodynamic changes. Presence of haemorrhagic lesions and frothiness in the respiratory passage supported the finding that it could have happened before the death of the animal, i.e ante mortem. The worms and the contents might have caused the irritation and inflammation which resulted in the above changes. Severe diffuse lung edema caused the asphyxia followed by death.

REFERENCES

- Cheema, A.H., M.Q. Khan and M.A. Chishti. 1997. Prevalence and pathology of amphistomosis in buffaloes and cattle in Pakistan. *Pak. Vet. J.*, **17**: 13-17. Available: http://www.pvj.com.pk/pdf-files/17_1/13-17.pdf
- Constable, P.D., K.W. Hinchcliff, S.H. Done, W. Grunberg. 2017. *Veterinary Medicine- A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs and Goats*, 11th ed. Elsevier, St.Louis Missouri, USA. p. 885-893.
- Dhillon, K.S., S.J. Kaur and M.A. Gupta. 2020. Case report on aspiration pneumonia in a cow. *Journal of Entomology and Zoology Studies*, **8**(3): 186-188.
- Ismail, A.L.M., A. Gopalakrishnan, C.S. Arunaman, M. Kavitha, S. Sumathi, D. Jayathangaraj, M.J. Thangaraj and C. Joseph. 2019. Secondary Aspiration Pneumonia in a calf. *Indian Vet. J.*, **96**(7): 63-64.
- Maxie, M.G. 2007. *Jubb, Kennedy and Palmer's Pathology of Domestic Animals*, 5th ed. Saunders Ltd., St.Louis Missouri, USA.
- Shakespeare, A.S., 2012. Aspiration lung disorders in bovines: A case report and review. *J. S. Afr. Vet. Assoc.*, **83**(1): 76-83. DOI: 10.4102/jsava.v83i1.921
- Thangapandiyan, M., K. Arulanandam, C. Balachandran and R. Sridhar. 2014. Pathology of biliary Amphistomiosis in Murrah buffaloes. *Indian Vet. J.*, **91**(11): 76-77.
- Veeraiah, G., M. Srinivas and N.L. Rani. 2008. Phytobezoar in a she-buffalo-A case report. *Buffalo Bull.*, **27**(2): 185-186. Available on: https://kukrdb.lib.ku.ac.th/journal/BuffaloBulletin/search_detail/result/286175
- Zachariah, J.F. 2017. Respiratory system, Mediastinum and pleurae. *Pathologic basis of Veterinary Disease*, 6th ed. Elsevier, St.Louis Missouri, USA.