

Pathology of pasteurellosis in Sambar Deer (*Cervus unicolor*)

A case report

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Pasteurellosis caused by *Pasteurella multocida* is generally responsible for epidemics among farm and wild animals (Parihar, NS 1978-79). The disease is characterized by an acute febrile course with severe fibrinous or fibrinopurulent bronchopneumonia, fibrinous pleurisy and septicaemia. *Pasteurella* species are commensal residents in the respiratory tract of healthy ruminants and are capable of causing infection in animals with compromised pulmonary defense system. Hence, the disease is essentially triggered by physical or physiological stress created by adverse environmental and climatic conditions.

Stress may either be psychological as induced by fear, restraint on handling or physiological resulting from hunger, thirst, fatigue or thermal extremes (Mohamed, R. A. & E. B. Abdelsalam, 2008). This disease has been reported in many animals including several species of deer (Chakraborty et al., 1995).

The present report describes the post mortem findings of the case and has a greater emphasis on pathology. A two year old Sambar deer (*Cervus unicolor*) belongs to Chedleth forest range, Pulpally, Wayanad district, Kerala, was brought to the Veterinary Hospital, Pookode Veterinary College, Wayanad with the history of multiple fractures at the distal end of the right metacarpal region. The fractured region was immobilized with plaster of Paris. The animal was approximately 35kg body weight and treated with Gentamicin 40mg/kg, Prednisolone Acetate 10mg/kg and Pheniramine maleate 10mg/kg through intra muscular route. The animal was in lateral recumbency for one week, showed clinical signs of anorexia, ataxia, diarrhea and continuous movement of fore legs and later died. Carcass was brought to Department of Pathology. During post mortem examination watery discharge from both the eyes were observed. Thoracic and peritoneal cavity showed subcutaneous petechial haemorrhages. Heart revealed epicardial haemorrhage at the coronary groove. Some pinpoint to echymotic haemorrhages also observed in the endocardium.

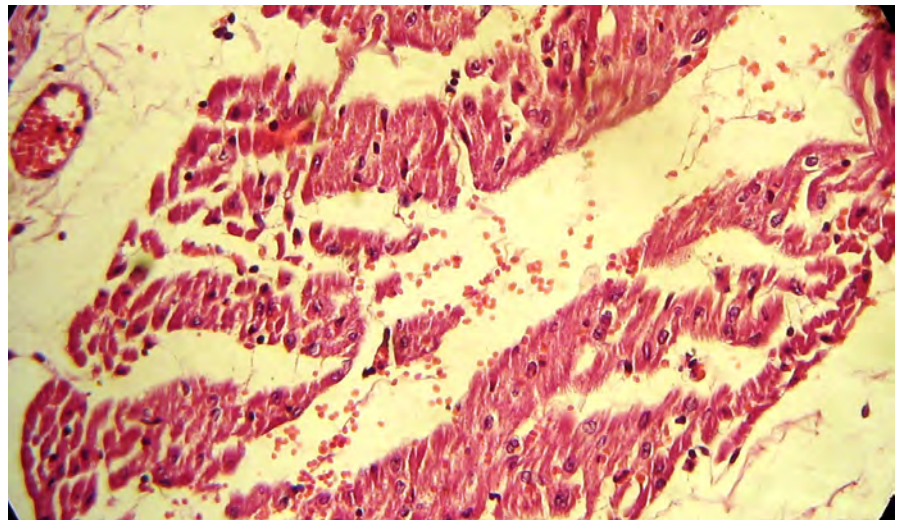


Fig (1): Heart: Epicardial haemorrhage by extravasation of RBC's H&Ex 400X

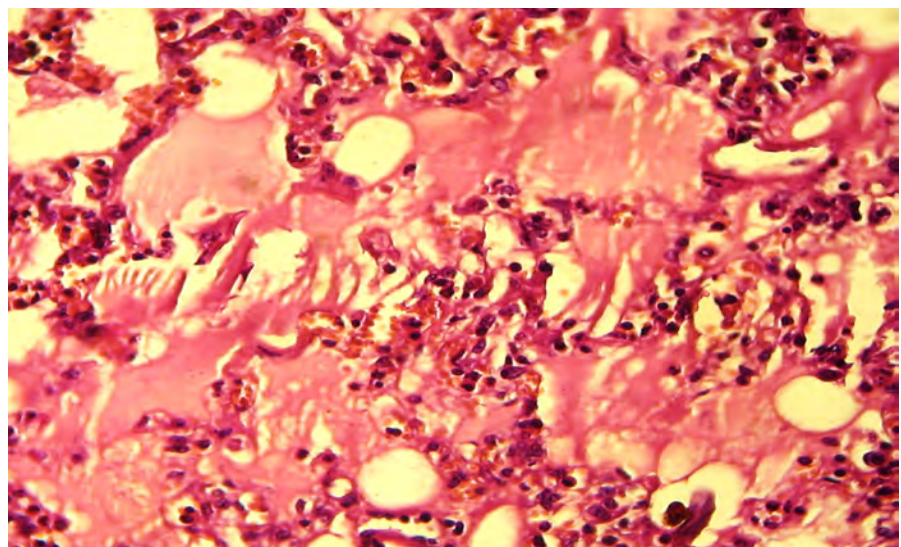


Fig (2): Lungs: Presence of homogenous pink edematous fluid within the alveoli H&Ex 400X

Haemorrhagic clots that were adherent with the myocardium were granular and fibrinous in texture. Trachea showed frothy exudates, lungs were pale, voluminous with unilateral enlargement of the left diaphragmatic lobe due to oedema. The cut section revealed oozing out of blood tinged sero-sanguinous fluid. These findings were coinciding with the earlier workers. (Chintu Ravishankar et al., 2004, Dhoot.V.M. and S.V.Upadhye.,

2001). Urinary bladder was distended with cloudy concentrated urine. The intestinal mucosa was congested, inflamed and the contents were catarrhal in type.

The applied plaster was intact over the right metacarpal region. On removing it, the fractured site revealed necrosis of muscles which extended up to the 2/3rd of metacarpal region. Cut section of the elbow joint revealed greyish-

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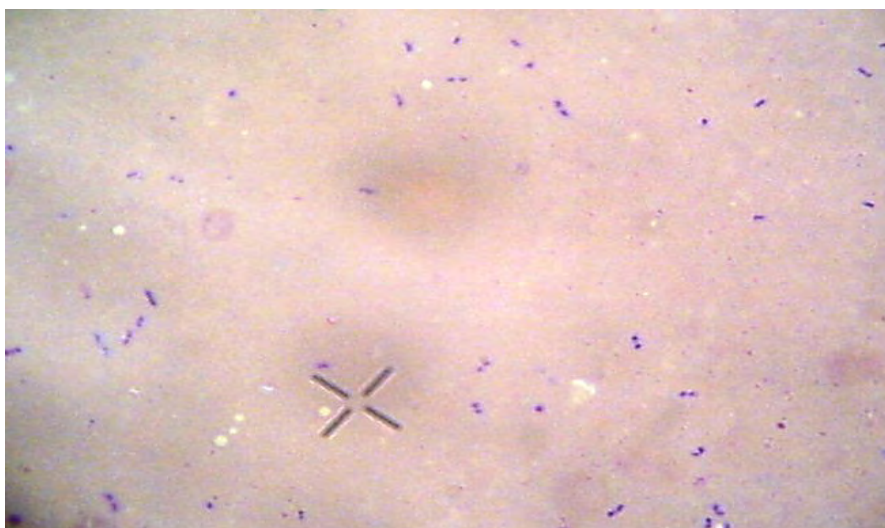


Fig (3): Bipolar organism isolated from the culture. Leishman's stain x1000X

yellow coloured synovial fluid which was adherent to the articular surface of the carpal and metacarpal bone .

Histopathologically, infiltration of neutrophils and extravasation of RBC's in the epicardium and endocardium were noticed (Fig 1). Mild mononuclear cell infiltration and loss of cross striations were also observed in the myocytes. Lung sections revealed homogenous pink edematous fluid within the alveoli and inter alveolar septa (Fig 2). Infiltration of the neutrophils and mild mononuclear cells also observed between the inter-alveolar septa. Both architectural and cellular details were lost in necrosed muscle cells.

Impression smears from lungs and liver showed bipolar organisms. Colonies on blood agar typically showed non haemolytic, profuse mucoid characteristics of *Pasteurella multocida*. The medium changed into a dark colour. When these colonies were stained with Gram's stain it revealed Gram negative, cocco-bacilli and typical bipolar organisms were observed with Leishman's (Fig 3) and methylene blue staining. The organisms were non-motile, indole and H₂S positive and urease negative. These organisms did not grow on McConkey's agar and found to be non haemolytic on blood agar (Quinn et al., 1994). These findings were also similar to Srinivasan et al., (1977).

Pathogenicity test, as described by Lennette (1980) was conducted in four mice. They were inoculated intraperitoneally with 0.2ml of

overnight incubated Brain Heart Infusion (BHI) broth culture and one mouse was kept as control inoculated with Phosphate Buffered Saline(PBS). They were observed for 6 hrs intervals and the broth culture inoculated mice died within 18-22 hrs. Post mortem was conducted in dead mice and the organs like lungs, liver and spleen revealed severe congestion and hemorrhage. The organism was re-isolated from heart blood and liver, lung and spleen of dead mice. The control mouse was sacrificed and no abnormalities were detected in visceral organs and no organism could be isolated.

In Pneumonic pasteurellosis the organism may progress to setup pneumonia and it is characterized by development of chronic pneumonia. Septicaemic pasteurellosis clinically characterized by a sudden onset of fever, submucosal petechiation, severe depression and death within 24hrs (Jubb et al., 1993).

Based on the bacteriological characterization the organism was identified as *Pasteurella multocida*. The causative organism for death of deer due to septicaemia was confirmed by mice pathogenicity test and re-isolation of the organism. In deer, pathologically different types of haemorrhages in heart and peritoneal cavity, and pulmonary oedema were observed. In the present case fracture could be one of the main pre disposing stress factor that triggered the commensal bacteria and to set up the septicaemia without development of pneumonia and caused death.

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