

VEGETATIVE VALVULAR ENDOCARDITIS IN AN INDIAN BUFFALO

G. Selvam¹, M. Swamy², Y. Verma², C.M. Karthik³ and R.S. Arya⁴**ABSTRACT**

Vegetative valvular endocarditis is one of the rare primary cardiac diseases in bovines. Among bovines, the incidence of this condition in Indian buffaloes is poorly reported. The present communication describes the gross and histopathological alterations in the case of vegetative valvular endocarditis observed in a 5-year-old she buffalo.

Keywords: buffalo, vegetative valvular endocarditis, pathological alterations

INTRODUCTION

Cardiac diseases in bovines are one of the easily overlooked veterinary cases (Maillard *et al.*, 2007) and the diagnosis is normally made almost at the terminal stage with poor prognosis (Reef *et al.*, 2008). Vegetative valvular endocarditis is rare (Healy, 1996) but one of the primary cardiac diseases that is usually caused by systemic or local infections by bacteria that colonize and injure the valvular endothelium. Although the left atrio-

ventricular valves are most commonly affected in other species, in bovines this condition is frequently observed in the right atrio-ventricular valve (Jones *et al.*, 1997). Since the incidence of this disease is very rare in buffaloes among bovines, the present communication will serve as a valuable record regarding the incidence and pathological alterations noted.

CASE HISTORY, GROSS AND HISTOPATHOLOGY

The animal had the clinical history of progressive emaciation, dullness, depression, reduced milk yield, exercise intolerance, dyspnea with grunt, chronic moderate pyrexia and death. On autopsy, the carcass had pin-point to ecchymotic hemorrhages on subcutaneous tissues and visceral surfaces. The heart was enlarged and the endocardium of the cardiac ventricles had suffusive hemorrhage. The cusps of right atrio-ventricular valves had irregular, yellow, loosely adhering, friable masses causing stenosis of the valvular space (Figure 1). The cortex of the kidney revealed, well demarcated, raised, round,

¹Department of Pathology, International Institute of Biotechnology and Toxicology, Padappai - 601 301, Kanchipuram District, Tamil Nadu, India, E-mail: sebhu.edu@gmail.com

²Department of Veterinary Pathology, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh - 482 001, India

³Veterinary Dispensary, Thandalaputhur, Musiri Division, Trichy District, India

⁴Department of Veterinary Pathology, Indian Veterinary Research Institute, Izat Nagar, Bareilly, India

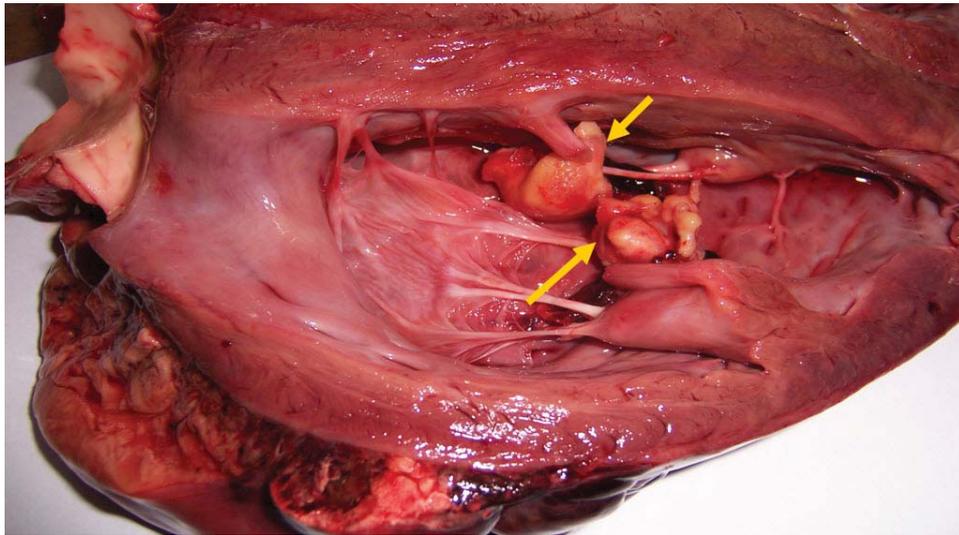


Figure 1. Photograph of heart shows vegetative valvular endocarditis in right-atrio ventricular valve. Arrow points cauliflower like vegetative growth.

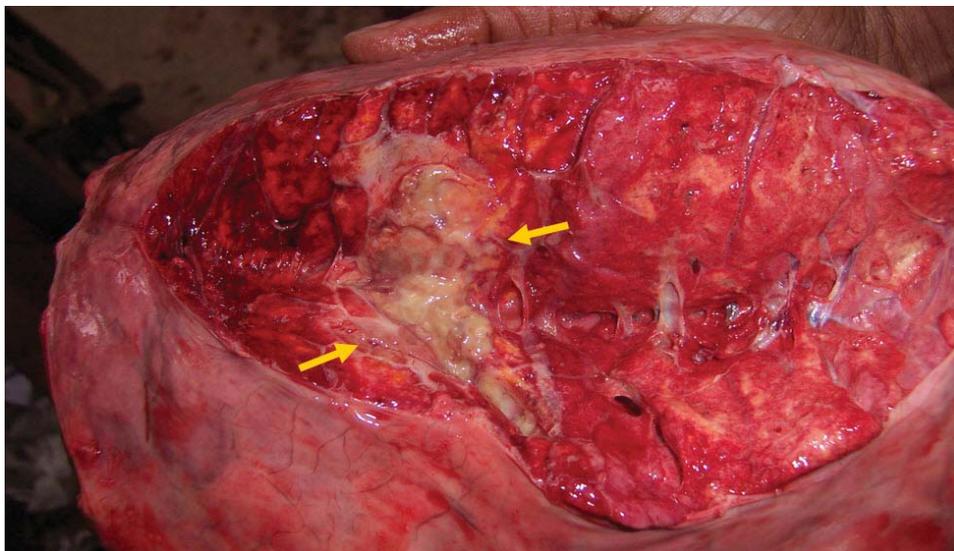


Figure 2. Photograph of lung shows embolic pneumonia and purulent exudates on cut section (arrows).

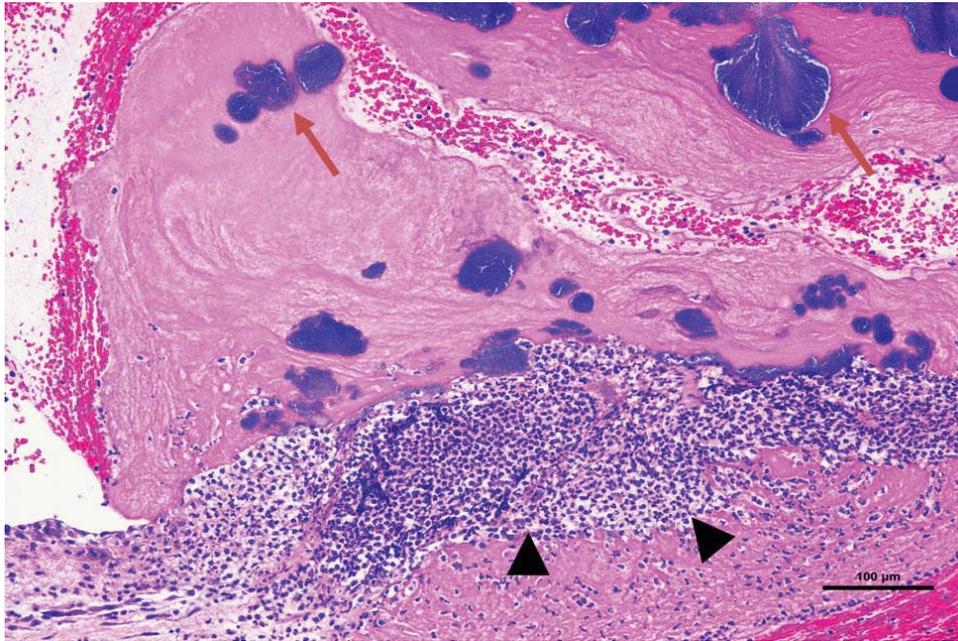


Figure 3. Microphotograph of right-atrio ventricular valve shows thrombosis, highly basophilic clumps of bacterial colonies (arrows) and ongoing suppurative inflammation on the valve (arrow heads). $\times 400$ H&E.

pin-point, miliary white foci bilaterally. The lung was wet, heavy and pale with multifocal irregular flat red foci and on cut surface showed purulent material on major airways of all lobes (Figure 1). On microscopical examination, the kidneys revealed, diffuse pyelonephritis bilaterally. Severe neutrophilic infiltration in interstitium and pelvis, tubular dilatation, focal to multifocal tubular necrosis, hemorrhage, interstitial edema and micro-cavities containing degenerating neutrophils (abscess) were observed in the cortex, medulla and pelvis of the kidneys. Severe pulmonary edema with suppurative inflammation in airways, obliteration of functional alveolar space with purulent exudates and thickening of alveolar walls was observed in lungs. Histopathology of the affected valve showed, severe suppurative inflammation and peri-valvular cuffing of thrombotic mass. The thrombotic mass was seeded with multifocal bacterial colonies

surrounded by multiple concentric layers of eosinophilic fibrin material (Figure 3).

DIAGNOSIS AND DISCUSSION

Valvular endocarditis in animals can be caused by two ways: primary adhesion of the microorganisms to the valvular endocardium or their entrapment to the pre-developed valvular thrombi (Jones *et al.*, 1997). In bovines, the causative organism includes *Arcanobacter pyogenes* -the most frequently isolated organism from these lesions (Vleet and Ferrans, 2007), *Streptococcus* sp., members of Enterobacteriaceae and *Bartonella bovis* (Maillard *et al.*, 2007). The pathogenesis includes focal injury to the endothelial valve, turbulent cardiac blood flow admixed with the pathogenic bacteria, adherence and colonization of

the bacteria in the injured site, induction of acute inflammation and resultant hypercoagulability of the blood in that particular focus leading to the formation and growth of thrombus. Continuous proliferation of the microorganisms leads to further organization of fibrin that gives rise to cauliflower like growths around the cusps of valves. Thus this condition is called vegetative valvular endocarditis (Jones *et al.*, 1997). In this present case the gross and histopathology of lung indicated, the presence of embolic pneumonia, which in bovines, usually results from the right side valvular endocarditis and dissemination of the septic emboli through hematogenous route (Vleet and Ferrans, 2007a). This type of dissemination also leads to formation of micro to large abscesses in multiple organs like kidney, spleen, liver etc., which is otherwise called as embolic shower.

The gross and histopathology findings observed in this case were in accordance with the description presented by previous workers and thus this present case is diagnosed as vegetative valvular endocarditis.

REFERENCES

- Healy, A.M. 1996. Endocarditis in cattle: A review of 22 cases. *Irish Vet. J.*, **49**: 43-48.
- Jones, T.C., R.D. Hunt and N.W. King. 1997. *Veterinary Pathology*, 6th ed. Williams and Wilkins, Maryland, USA. 1392p.
- Maillard, R., E. Petiot, B. Chomel, C. Lacroux, F. Schelcher, M.V. Taussat, N. Haddad and H.J. Boulouis. 2007. Endocarditis in cattle caused by *Bartonella bovis*. *Emerging Infectious Diseases*, **13**(9): 1383-1385.
- Reef, V.B. and S.M. McGuirk. 2008. Diseases of the cardiovascular system, p. 453-489. *In* Smith, B.P. (ed.) *Large Animal Internal Medicine*, 4th ed. Elsevier-Saunders St. Louis, Missouri.
- Vleet, J.F.V. and V.J. Ferrans. 2007. Cardiovascular System, p. 559-580. *In* McGavin, M.D. and J.F. Zachary (eds.) *Pathologic Basis of Veterinary Disease*, 4th ed. 1476p.
- Vleet, J.F.V. and V.J. Ferrans. 2007a. Respiratory System, p. 463-558. *In* McGavin, M.D. and J.F. Zachary (eds.) *Pathologic Basis of Veterinary Disease*, 4th ed. 1476p.