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Vegetative valvular endocarditis due to *Enterococcus faecalis* in a broiler chicken

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ABSTRACT

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A carcass of 6 weeks old Vencobb chicken which had the history of loss of body weight since a few days was presented. On necropsy, irregular growth was noticed in the left atrioventricular valvular endocardium of the heart. Histopathological examination revealed septic thrombus which was attached with the basal valvular endocardium of mitral valve along with inflammatory changes. Bacterial emboli were present in various visceral organs like lung, liver, spleen and kidney. Microbiological examination of heart blood swab revealed *Enterococcus faecalis*. Based on gross, microscopic and cultural examination the case was diagnosed as vegetative valvular endocarditis due to *Enterococcus faecalis*.

Keywords: Chicken, *Enterococcus faecalis*, pathology, vegetative valvular endocarditis

Endocariditis is an inflammation of the inner lining of heart, the endocardium and usually involves the heart valves and is often caused by bacteria[1]. Bacterial endocarditis in poultry is usually caused by streptococci and enterococci. Natural infections in poultry resulting in bacterial endocarditis are commonly associated with streptococci and other bacteria such as *S. zooepidemicus*, *S. gallinaceous*, *Enterococcus faecalis*, *E. faecium*, *E. durans*, *Staphyloccocus aureus*, *Avibacterium gallinarum* and *Pasturella multocida*[2]. *Enterococcus faecalis* was previously named as *Streptococcus faecalis*[3]. *Enterococcus faecalis* has been the most common isolate in natural infections[4]. The present report describes the pathology of naturally occurring vegetative valvular endocarditis in a broiler chicken.

A 6 weeks old Vencobb broiler chicken died with the history of depression, decreased feed intake and emaciation was brought for post-mortem examination. Detailed necropsy was carried out and gross lesions were recorded. Internal examination showed congestion with moderate consolidation of lungs. Liver and spleen were enlarged and mottled in appearance. Kidneys were enlarged and pale. Mesenteric vessels were congested and intestinal lumen contained yellowish mucus contents. Left ventricle of heart revealed yellowish, raised, cauliflower like friable growth attached with the antrioventricular valve (Fig. 1). Affected organs were collected in 10% formalin for histopathological examination and processed as per standard protocol[5]. Swab from the heart blood and a piece of thrombus were collected for cultural examination. Microscopic examination of left atrioventricular valve of heart revealed patchy area of necrosis of endocardium, infiltration of inflammatory cells predominantly with lymphocytes followed by heterophils and a bacterial thrombus with fibrous tissue proliferation at the periphery (Fig. 2). Liver showed moderate vacuolar degeneration of hepatocytes with acinar formation. Multifocal bacterial emboli were seen in the sinusoids (Fig. 3). Lungs revealed moderate infiltration with lymphocytes and macrophages and scattered bacterial emboli in the capillaries. Kidneys were congested with multifocal bacterial emboli in the intertubular vessels. Spleen revealed mild lymphoid depletion with multifocal bacterial emboli. Intestine revealed mucosal congestion, multifocal bacterial emboli and mononuclear cell infiltration in the lamina propria. Cultural examination of heart blood swab and thrombus revealed red pin point colonies in the Mac Conkey agar and small, pin point, circular and convex colonies with á haemolysis on blood agar. Biochemical test were negative for catalase and oxidase. Organisms morphologically appeared as Gram positive cocci and were identified as *Enterococcus faecalis*.

Bacterial vegetative endocarditis associated with streptococcus was first reported in 1927[6]. The portal of entry and the pathogenesis of valvular endocaritis reported to be unclear, but incidence is more with pododermatitis[7]. Though *Enterococcus spp* is a common intestinal inhabitant in majority of birds, aerosol infection is responsible for pathology of streptococcal infection and is mainly attributed due to septicaemia. The most frequent causes of septicaemia include *E. faecalis*, *E. coli*, *Pasteurella multocida* and *Avibacterium gallinarum.* Endocarditis occurs when septicaemic streptococcal infection progress to a subacute or chronic stage[8]. Valvular lesion and bacterial emboli recorded in various visceral organs possibly due to secondary effect of septicemic valvular lesions found in this study are in accordance

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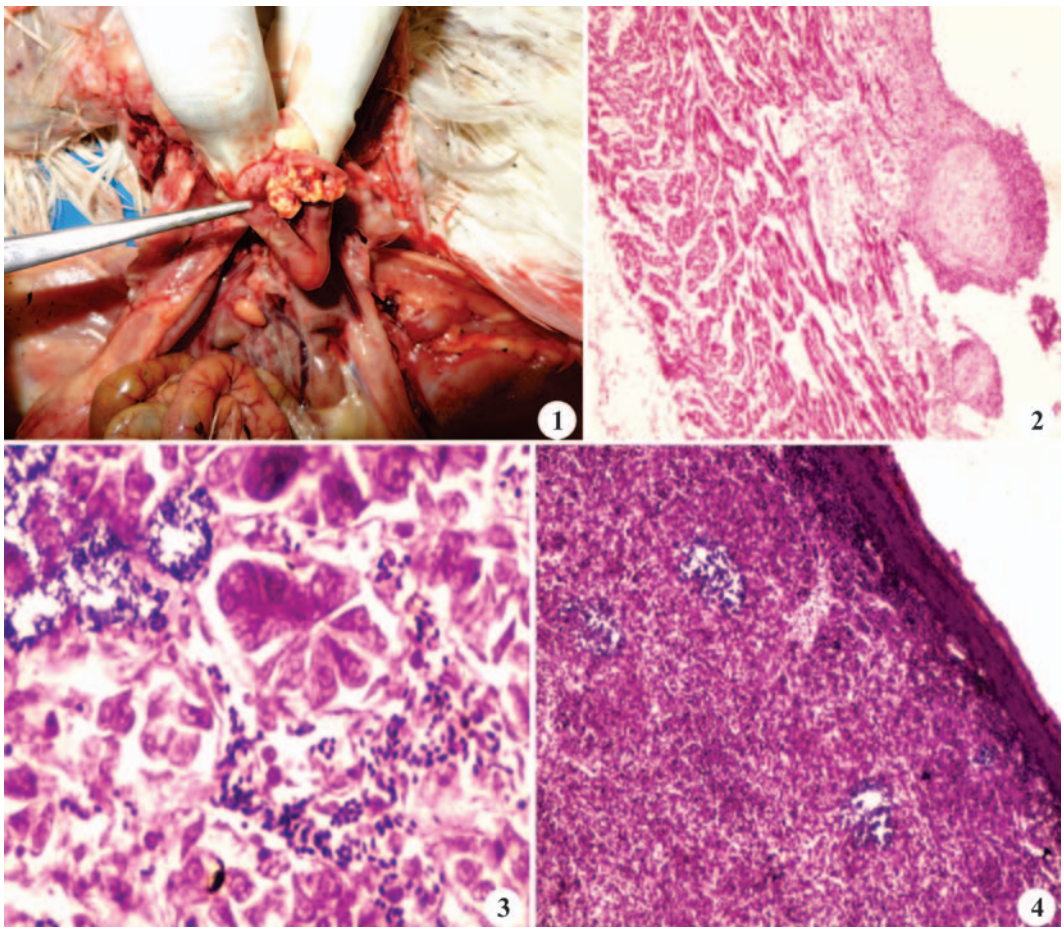

Fig.1. Heart: Vegetative growths over the mitral valve of left ventricle; **Fig.2.** Heart: Left atrioventricular valve - a septic thrombus attached with basal endothelium with fibrous tissue proliferation and cellular infiltration. H&E x400; **Fig.3.** Liver: Bacterial emboli within sinusoids and acinor formation of hepatocytes. H&E x400; **Fig.4.** Spleen: Bacterial emboli within splenic sinusoids. H&E x40.

with the findings of earlier workers[2,9,10]. Mortality due to endocarditis without specific symptoms seen in this case were in accordance with earlier reports[11].

Naturally occurring bacterial endocarditis associated with *Enterococcus faecalis* in the present study explains the proliferative vegetative lesions in the endocardium of left atrioventricular valve in a six weeks old broiler chicken. The proliferative growth consists of fibroblast, inflammatory cells and bacterial colonies. *Enterococcus faecalis* is the most common among other bacterial pathogens and commonly occur due to faecal contamination.

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