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Ebstein's Anomaly in a Golden Retriever puppy

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Abstract

A 3-month-old Golden retriever pup was presented with complaints of abdominal distension, lethargy and inappetence. On clinical examination pale mucous membrane, tachycardia and cardiac murmurs were observed. Haemato-biochemical examination revealed anaemia, leukocytosis, hypoalbuminaemia and elevated serum alkaline phosphatase. Radiographic findings indicated cardiac enlargement and ascites. Increased P wave duration and atrial tachycardia were the major findings on electrocardiography. Echocardiography revealed enlarged right chambers, collapsed left chambers and posteriorly placed tricuspid valves along with regurgitant flow diagnostic of Ebstein's anomaly. Treatment was initiated with antibiotics, diuretics, ACE inhibitors and cardiac supportive. Pup succumbed to death the next day.

Keywords: Tricuspid dysplasia, Ebstein's anomaly, Echocardiographic changes

Introduction

Ebstein's anomaly is a special case of tricuspid dysplasia in which tricuspid valve leaflets were apically displaced compared to the level of mitral annulus and there was a division of right ventricle (RV) into the functional and atrialized RVs leading to enlarged right atrium (RA) and tricuspid regurgitation ultimately leading to right sided heart failure signs (Dearani, *et al.,* 2015). Ebstein's anomaly in a Golder retriever puppy is presented in this article.

Case History and Observations

A 3-month-old male Golden retriever was referred to Teaching Veterinary Clinical Complex, Pookode due to unresolved ascites. Owner reported that the animal was having reduced feed intake and distended abdomen for one month and was treated with amoxicillin, pantoprazole and furosemide but there was no improvement. The animal was lethargic and ascites was noticed on physical examination (Fig.1). Clinical examination revealed blanched mucous membrane, with rectal temperature of 102.6°F, tachycardia and 5/6 holosystolic murmurs on auscultation. No parasitic ova could be detected on faecal sample examination. Clinico-pathologic data revealed mild anaemia ($4.9x10^6$ erythrocytes/µL), leucocytosis ($28.64 x10^3$/µL), mild hypo-albuminaemia (2.05 g/dL), and increase in serum alkaline phosphatase (606.17U/L). There was cardiac enlargement, and ascites (Fig. 2). Atrial tachycardia, increased P wave duration (0.08 sec), short QT interval and increased R wave amplitude (3.4 mV) were observed in electrocardiography (Fig 3). Echocardiography revealed displaced tricuspid valve (Fig 4 & 5), marked dilatation of right heart chambers (Fig 6), and a defect at interventricular septum (turbulence on colour doppler). Considering all these findings animal was diagnosed as having tricuspid valve dysplasia/ Ebstein's anomaly. Treatment was initiated with amoxicillin-sulbactam, pantoprazole, furosemide and amino acids as injections. Advised to continue amoxicillin-sulbactam, pantoprazole, furosemide orally along with cardio-supportive tabs. Animal succumbed to death the next day. The owner denied conducting a necropsy of the dog

Discussion

Tidholm (1997) reported that Ebstein's anomaly is uncommon in dogs and cats. Most commonly affected breed is Labrador retriever (Andelfinger *et al*., 2003). Frequently observed structural abnormalities in Ebstein's anomaly encompass atrial septal defect, patent foramen ovale, pulmonary stenosis or atresia, and ventricular septal defect. The diagnosis of tricuspid valve dysplasia relies on clinical indicators and supplementary tests. According to Kittleson (1998), significant enlargement of the right atrium in a young animal exhibiting a right apical systolic murmur is typically indicative of severe tricuspid dysplasia. Echocardiographic assessment typically reveals a significantly enlarged right atrium accompanied by right ventricular volume overload

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(Chetboul *et al*., 2004). Additionally, the left heart chambers are frequently smaller than usual. Tricuspid leaflets may exhibit limited mobility, appear oversized, or adhere to either the interventricular septum or papillary muscles. Furthermore, turbulent regurgitant flow into the right atrium during systole is noticed (Kittleson, 1998). In human medicine, the primary approach to treating Ebstein's anomaly involves surgical intervention, complemented by medical management targeting signs of right-sided heart failure. Conversely, surgical intervention is not commonly pursued in veterinary practice due to technical limitations.

Fig 1. Golden retriever puppy with ascites

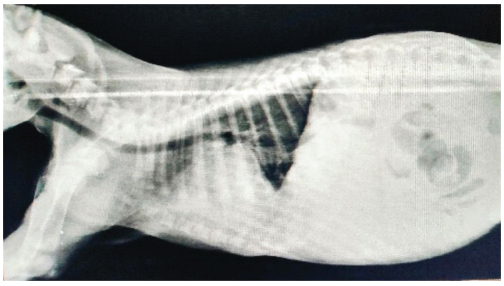

Fig 2. Radiography- Ascites

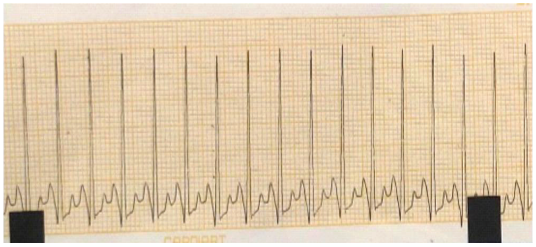

Figure 3. ECG of the puppy suggesting atrial tachycardia. 25mm/s paper speed

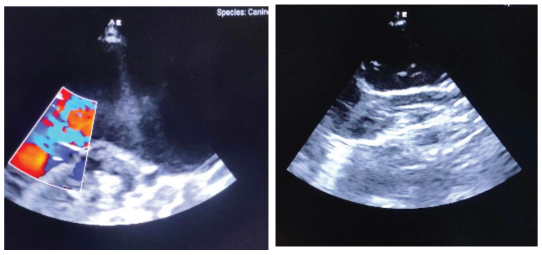

Fig 4 and 5. Echocardiography showing regurgitation and displaced tricuspid valves

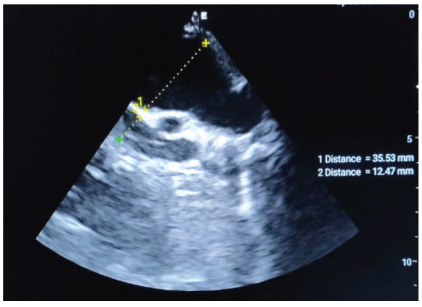

Figure 6. Echocardiography showing severely dilated right atrial chamber

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