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Successful medical management of tracheal collapse and cardiomegaly in a dog

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Abstract
A six year old female dog was presented to Department of Veterinary Surgery and Radiology, Veterinary College, Hebbal, Bangalore with history of open mouth breathing, cough and exercise intolerance. Based on clinical signs, electrocardiographic and radiographic findings case was diagnosed as tracheal collapse with cardiomegaly. Dog was successfully managed with steroids, ACE inhibitors and chondroitin sulphate for more than eight months.

Keywords: tracheal collapse, cardiomegaly, exercise intolerance, ACE inhibitors

Introduction
Tracheal collapse is a progressive, dorsoventral flattening of the tracheal lumen. It is most common in middle-aged, small toy breed dogs like Yorkshire terrier, toy poodle, pomeranian, chihuahua, pug (Hedlund, 1991) [6] and it is characterized by degeneration of the hyaline cartilage rings and weakening of the dorsal trachealis muscle (Ettinger, 2010) [3]. This condition is a common cause of cough and airway obstruction in dogs but it is very rare in cats (Foley and Krarup, 1991) [4]. Cardiac diseases are also commonly associated with tracheal collapse (Nelson, 2003) [9]. Tracheal collapse is irreversible, but several medical and surgical options can help to palliate clinical signs. In this paper, management of tracheal collapse with cardiomegaly in a pug breed of dog is discussed in detail.

History and Observation
A six year old female pug dog was presented to the Department of Veterinary Surgery and Radiology, Veterinary College, Hebbal, Bangalore with a history of coughing, open mouth breathing, difficulty in walking and exercise intolerance since four months. On Clinical examination hurried respiration, cough, tachycardia and restlessness was noticed. The haematological and biochemical parameters were within the normal range (table-1). On auscultation, lung and heart sounds were not clear and severe inspiratory dyspnoea was noticed. Electrocardiographic examination revealed mild degree of ST coving with sinus tachycardia (Heart rate-155) with RR interval of 0.36s and R amplitude was 0.8mv and (Fig 1). Lateral view survey radiography of thorax revealed mild degree of cardiomegaly with narrowing of trachea suggestive of third degree of tracheal collapse up to its length. (Fig 2).

Treatment and Discussion
Dogs with tracheal collapse often presented with respiratory distress and must be considered as medical emergency because these patients are often unstable. Animal was treated with Corticosteroids i.e Inj. Prednisolone @ 1mg/kg (Prednisolone 10mg/ml, Intervet SPAH) b.i.d intravenously for seven days, Inj. Ceftriaxone @ 25mg/kg body weight (Intacef 500 mg, Intas pharmaceutical, Allahabad) iv b.i.d for seven days, Tab Enapril @ 0.25mg/kg body weight bid, orally for life (ENVAS-H, 5mg, Cardilla). Inj Furosemide @2mg/Kg body weight was given intermittently along with daily dosing of Chondroitin sulphate (Tab. Petjoint, Cargill). After seven days animal was kept on steroids in tapering dose for a period of one month, diuretics was given once in five days, and chondrotin sulphate was given for daily sixty days. Review radiograph and Electrocardiography was taken after 60 days didn't show any changes when compared to earlier reports. Animal was doing well for more than eight months and owner was advised to follow same.

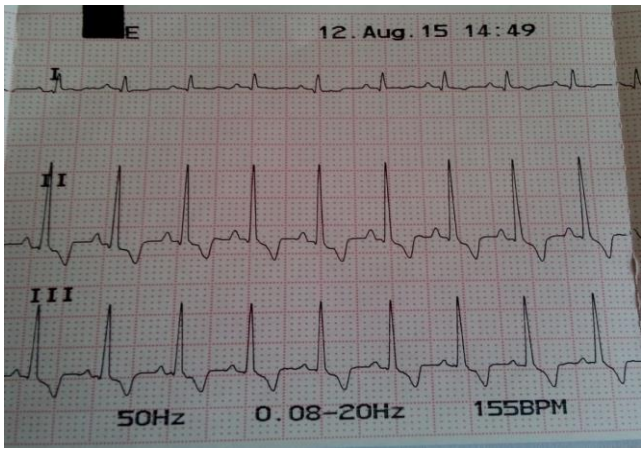

Fig 1: Electrocardiography showing mild degree of ST coving with sinus tachycardia.

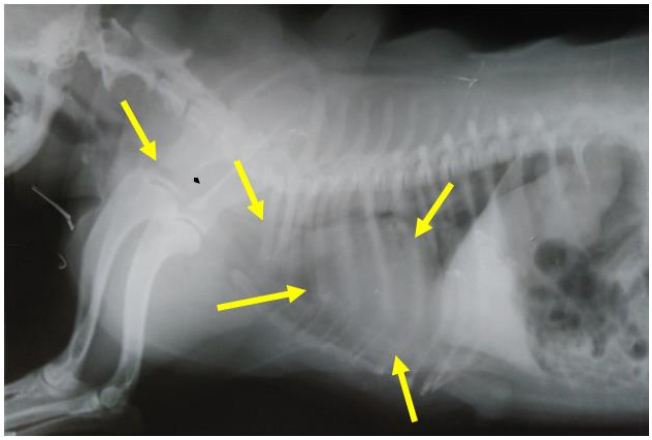

Fig 2: Survey radiography of lateral thorax showing tracheal collapse and slight Cardiomegaly

Table 1: showing Haematological and Biochemical Parameters of the dog.

Haemoglobin	**11.2 g%**	**Bilirubin Total**	**0.30 mg/dl**
Total Count	11,700 cells/cumm	Bilirubin Direct	0.15 mg/dl
RBC	5.13 millions/cumm	Creatinine	0.78 mg/dl
Differential count		BUN	15.4 mg/dl
Neurophils	73%	SGPT	37.4 U//I
lymphocytes	21%	SGOT	41.7 U/I
Eosinophils	1%	Total Protein	7.3 g/dl
monocytes	4%	Albumin	4.1 g/dl
Platelets	3.39 lakhs/cumm	Blood Glucose	108 mg/dl
PCV	44%		
MCV	24.4 um3		
MCHC	35.5 g/dl		

Dogs presenting with tracheal collapse often have a history of chronic waxing and waning respiratory difficulty or coughing that has progressively worsened over time (Johnson and McKiernan, 1995) [7]. The cough is usually paroxysmal and has been historically described as a "goose honk (Padrid and Amis, 1992) [10]. The cause of tracheal collapse is not completely understood but is likely multifactorial and the affected cartilaginous rings and dorsal trachealis muscle are less turgid than normal, interfering with the structural integrity of the tracheal wall (Dallman *et al*., 1988) [2].

As the tracheal was collapsed to its length, animal was managed medically even though 22% to 35% of dogs with tracheal collapse were not responsive to medical management (Buback *et al*., 1996) [1] and (Tangner and Hobson, 1982) [11].

Pet was treated with corticosteroids, to resolve clinical signs but long-term use predisposes animal to bacterial infections of the upper or lower respiratory tract. In order to combat concurrent respiratory tract infections antibiotics were used along with steroids. (Herrtage and White, 2000) [5]. Laryngeal edema and tracheal inflammation are common sequelae to increased respiratory effort associated with tracheal collapse cases in distress.

To relieve laryngeal oedema, furosemide was used intermittently for short term. (Kerr, 1989) [8]. Pet had concurrent cardiomegaly so animal was kept on antihypertensive drugs along with restricted exercise and activity. Exercise restriction is very important part of initial management, especially in hot weather (Wolfsheimer, 1994) [12] and this should be followed for life because when animal is put to excersise, body demand for oxygen is increased which animal cannot manage because of collapsed trachea and cardiac condition.

Animal was supplemented with chondroitin sulphate for sixty days, because diseased tracheal cartilage contains less chondroitin sulfate when compare to normal cartilage (Dallman et al., 1988) [2] and also has decreased amounts of glycosaminoglycans and glycoproteins to bind water, leading to uncharacteristic compliance and decreased rigidity of the tracheal rings.

Conclusion

Early diagnosis and proper medical treatment helps in further complications and death. Successful Medical Management of Tracheal collapse and Cardiomegaly in a dog is reported.

Acknowledgement

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