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J. Adv. Vet. Anim. Res., 2(2): 221-224.
Available at- *http://bdvets.org/JAVAR*

JAVAR Journal of Advanced Veterinary and Animal Research

CASE REPORT Volume 2 Issue 2 (June 2015)

DOI: 10.5455/javar.2015.b69

Hypothyroid associated megaesophagus in dogs: four years (2009-2013) study in Hyderabad, India

Karlapudi Satish Kumar* and Devarakonda Srikala

Veterinary Medicine, College of Veterinary Science, Sri Venkateswara Veterinary University, Tirupati, India.
**Corresponding author's e-mail: drsatish.ksk@gmail.com*

ABSTRACT

Megaoesophagus is uncommon but an important consideration for chronic regurgitation in dogs. Five dogs of various breeds were presented to the Teaching Veterinary Clinical Complex (TVCC) at College of Veterinary Science, Hyderabad with signs of chronic regurgitation, loss of weight, lethargy, weakness, dehydration and abnormalities of skin, and hair coat were diagnosed for megaesophagus on barium meal contrast radiography. At the TVCC, radiography and gastroscopy were performed, and the condition was confirmed as megaesophagus. Ancillary hemato-biochemical evaluations revealed normocytic normochromic anemia and mild leukocytosis with normal enzymatic activity in liver and kidneys. The thyroid profile in 80% (n=4/5) dogs showed decreased T_3 and T_4, and elevated thyroid stimulating hormone (TSH) levels confirming hypothyroidism. Ultrasonography of abdomen eliminated obstructions in the gastro-intestinal tract and other systemic conditions. Echocardiographic observations were normal in all the dogs. Treatment with metoclopramide (dosed at 5 mg/kg bwt) and levothyroxine (dosed at 20 µg/kg bwt) and modified management practices involving feeding and diets were successful in controlling the regurgitation in dogs and resulted in good clinical recovery within 20-30 days of post-treatment.

Keywords

Dogs, Megaesophagus, Regurgitation, Hypothyroidism

ARTICLE HISTORY

Received : 31 August 2014, **Revised**: 28 October 2014,
Accepted : 10 November 2015, **Published online**: 7 February 2015.

INTRODUCTION

Megaesophagus is a condition in which the muscles of the esophagus lose their tone and are no longer able to propel food into the stomach. As a result, the esophagus becomes dilated leading to esophageal paralysis and dysfunction. The majority of cases in canine, megaesophagus have no apparent cause and hence the condition may be termed as idiopathic megaesophagus. The disease can be either secondary to underyling disease, such as, hypothyroidism or mysthenia gravis or a congenital disease associated with vascular ring anomaly in very young puppies. Clinical signs of megaesophagus vary depending on severity and may include: regurgitation that may begin minutes to several hours after eating or drinking, excessive salivation, mild to moderate weight loss, coughing or wheezes (German, 2005).

MATERIALS AND METHODS

Five dogs of various breed, age and sex were presented during 2009 to 2013 to the Teaching Veterinary Clinical Complex (TVCC), Bhoiguda, College of Veterinary Science, Hyderabad with the history and clinical signs of chronic recurrent regurgitation of undigested food following food intake, loss of weight, lethargy, weakness, dehydration and abnormalities of skin, and hair coat. After thorough clinical examination, blood and serum were collected for hemato–biochemical evaluations *viz.* total erythrocyte count (TEC), hemoglobin, liver and kidney specific enzymes, and thyroid profile. Later, imaging studies like thoracic and abdomen radiography (plane and contrast) were undertaken, followed by gastroscopy and abdomen ultrasonography were done to evaluate the cause of chronic vomiting.

Based on radiographic, gastroscopic and thyroid profile findings, the dogs were diagnosed for megaesophagus associated with hypothyroidism. The dogs were managed with administration of parenteral administration of metoclopramide dosed at 5 mg/kg bwt, and oral levothyroxine dosed at 20 µg/kg bwt, along with other supportive drugs and managemental practices.

RESULTS AND DISCUSSION

Detailed and thorough anamnesis revealed that the dogs were expelling the undigested food within few minutes of consumption. Further, almost all the dogs were showing similar manifestations *viz*., vomiting, cough, dull, dehydrated and weight loss with increased appetite, and most of them were (n=4/5) lethargic with exercise intolerance, bilateral alopecia, pigmentation with rat tail **(Figure 1 to 3).** Thorough clinical examination revealed normal clinical parameters *viz*., temperature (101.2^{0}F), pulse (68/min) and respiration rates (23/min), but with moderately pale visible mucous membranes. Hematologically, moderately low TEC (5.14X10^6/µL) and hemoglobin (7.64 g/dL), along with mild leukocytosis (9.36X10^3/µL) with neutrophilia (82%) were recorded. Similarly, no abnormality was detected with liver specific and kidney enzymatic activity. In dogs with megaesophagus, the esophagus dilates, or enlarges due to the lack of muscle tone, as a result of which, the food gets lodged in the esophagus, and unable to move to the stomach. Megaesophagus is seen more often in dogs as compared to cats. Some breeds like, German shepherds, Dachshunds, Great Dane, Labrador retriever and Pug are reported to be predisposed to this condition (Suryavamshi et al., 2001). Regurgitation is considered the hallmark sign of megaesophagus. Also, aspiration pneumonia may develop due to the entrance of food or liquid into the lungs. Vomiting, cough, nasal discharge, respiratory noises, weight loss with increased hunger, halitosis and poor growth were the significant signs associated with megaesophagus (Guilford, 2005). In the present study, the condition was similar diagnosed in Labrador retreiver (n=3), Pomeranian (n=1) and German shepherd (n=1) with support of the findings of Suryavamshi et al. (2001) and Guilford (2005). Whereas, Suryavamshi et al. (2001) opined that emaciation, hidebound condition, shrunken abdomen, prominent ribcage and slight to moderate pain and discomfort at cervical and abdominal area on palpation were the prominent clinical signs in megaesophagus dogs.

Figure 1. Depressed, dehydrated and weakened megaesophagus dog.

Figure 2. Bilateral alopecia and rat tail appearance-hypothyroidism.

Figure 3. Patchy alopecia - hypothyroidism.

Figure 4. Dilated esophagus – contrast Xray.

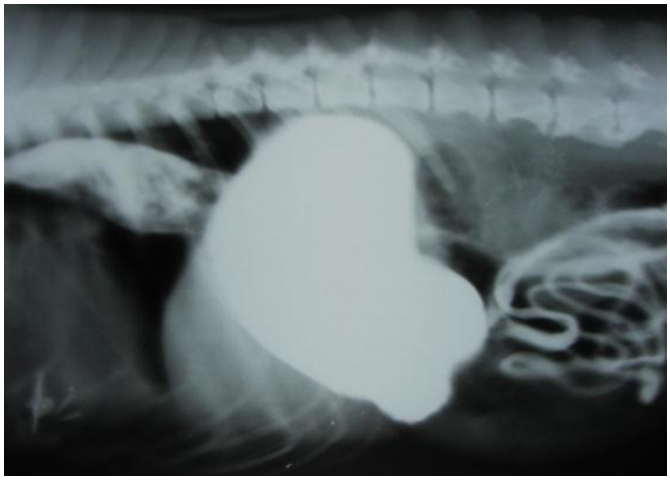

Figure 5. Barium meal contrast radiograph – dilated esophagus.

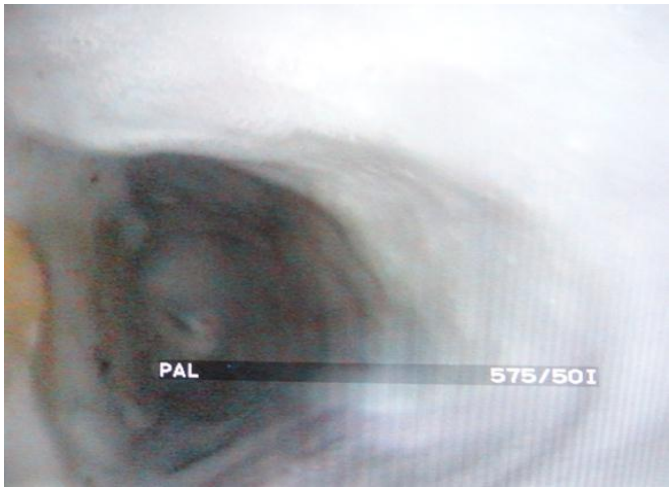

Figure 6. Endoscopic image – dilated esophagus with flaccid walls.

The authors further reported that no significant serum chemistry alterations could be commonly seen in megaesophagus cases. Plain radiographic examination of thorax and abdomen of all the cases did not reveal any foreign body. Similarly, ultrasonographic evaluation of abdomen did not reveal any abnormality in echogenic texture of gastric wall and small intestine. Further, echocardiographic evaluation was found as negative for any persistent aortic arch (Umarani, 2007). Whereas, barium meal contrast radiography of all the 5 dogs revealed dilatation of cervical and thoracic esophagus **(Figure 4 and 5).** Guilford (2005) reported that plain radiography might not help to diagnose megaesophagus. However, Jain and Tayal (2008) could diagnose the condition by using contrast radiography with barium meal.In our study, gastroscopy was performed under ketamine (dosed at 10 mg/kg bwt) and xylazine (dosed at 1 mg/kg bwt) anesthesia. Endoscopic examination of all the 5 dogs revealed severely dilated esophagus (**Figure 6**) from cervical portion to gastro-esophageal sphincter, giving a cavernous appearance and the flaccid redundant walls that were draped against trachea, with pooling of gastric fluid into the esophageal lumen (Tams, 1996). Gualtiere (2001) and Guilford (2005) strongly suggested that endoscopic evaluation had no comparison in diagnosing megaesophagus, and differentially diagnosing regurgitation in dogs.

In the present study, 4 out of 5 dogs were shown altered levels of thyroid profile *viz*., decreased T_4 (1.26 µg/dL), T_3 (29.54 ng/dL) and increased thyroid stimulating hormone (TSH) (7.58 ng/mL) against normal levels (3.44, 72.18 and 2.12), respectively. One of the probable causes for megaesophagus was hypothyroidism, which could be attributed to general metabolic derangements that occurred in impaired thyroid function or might be an indication of a neuropathy or myopathy (Fors, 2008). The findings were supported by Jaggy et al. (1994), who stated that, in hypothyroidism, nerves did not conduct electrical impulses normally. This might account for some of the general weakness, exercise intolerance, lethargy and listlessness observed in hypothyroidism.

From the present findings, the presented 5 dogs were diagnosed for megaesophagus, of which 4 were associated with hypothyroidism and 1 was of idiopathic origin. All these dogs were treated with antiemetic (metachlopromode dosed at 0.5 mg/kg, IM), for three days along with levothyroxine (n=4/5 dogs) dosed at 20 µg/kg, orally once for 30 days. Further, the owners were advised to feed small amount of liquid or semi solid food that was easily digestible. All the 5 dogs gradually improved physically with alleviation of clinical signs and became normal with normal hydration status and skin and coat condition (n=4/5 cases) by 20-30 days. However, levothyroxine was continued for hypothyroid cases.

Megaesophagus could be associated with certain neuromuscular diseases like myasthenia gravis. But most of the causes, the condition might be of idiopathic in origin. However, other known causes of megaesophagus were hypothyroidism, hypoadrenocorticism, esophagitis, autoimmune diseases and heavy metal poisoning (Scott-Moncrieff, 2007). In the dogs having paralysis of esophagus, the food, water and medications might be placed in a vertical or elevated position to allow gravitational fall into the stomach. German (2005) and Jain and Tayal (2008) documented that, offering food, water and treats with the placement of pet in a vertical position (*i.e*., sitting up in a begging pose) were important aspects in management of megaesophagus. Feeding from a height made use of gravity and optimized passive transport of food from oro-pharynx into stomach. The affected dogs could also be fed over shoulder and held in a vertical position to allow passage of food into stomach. German (2005) reported that feeding of dogs by gravity might lead to complications like aspiration pneumonia and malnutrition. Further, it was suggested that the amount of food offered at each feeding; the number of meals per day and the format (liquefied food, blended to a smooth consistency in a blender, or food compressed into meatball form) played a major role in management of megaesophagus. Jain and Tayal (2008) on evaluating feeding practices in dogs with megaesophagus reported that high fat, raw, processed and rice diets were leading to frequent regurgitation, aspiration pneumonia, bacterial infections and poor tolerance, respectively. However, it was suggested to feed low fat diets, as it was well tolerated by dog. The findings in the present study revealed that the 80% dogs (n=4/5) were associated with hypothyroidism and 20% (n=1/5) with an idiopathic origin. Whereas, all the affected cases were effectively managed with an antiemetic *viz*. metachlopromide dosed at 0.5 mg/kg, IM, for three days, and to those hypothyroidic dogs with levothyroxine dosed at 20 µg/kg, PO, S.I.D for 1 month. Further, the owners were advised to feed soft and easily digestible liquid diets and/or semi-solid foods in small quantities but at frequent intervals from an elevated platform. However, by the end of treatment schedule (20–30 days), all the 5 dogs showed complete clinical recovery.

CONCLUSION

Dogs presented with signs of chronic regurgitation, loss of weight, lethargy, weakness, dehydration and abnormalities of skin and hair coat are suggested for megaesophagus. In most cases, megaesophagus in dogs is found to be associated with hypothyroidism. Treatment with metoclopramide and levothyroxine and modified management practices involving feeding and diet can be used in controlling the regurgitation in the dogs.

ACKNOWLEDGEMENT

The authors are thankful to Sri Venkateswara Veterinary University, Tirupati for providing the facilities to carry out this work.

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