



International Journal of Veterinary Sciences and Animal Husbandry



ISSN Online: 2456-2912
NAAS Rating (2026): 4.61
IJVSAH 2026; SP-11(10): 06-09
www.veterinarypaper.com
Received: 15-08-2026
Accepted: 17-09-2026
Published: 02-10-2026

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Management of megaesophagus associated with hypothyroidism in a Labrador Retriever: A case report

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DOI: <https://www.doi.org/10.22271/veterinary.2026.v11.i10Sa.3826>

ABSTRACT

A 3-year-old male Labrador Retriever was presented to the Veterinary Clinical Complex, Belgachia, Kolkata, West Bengal, with a 7-day history of regurgitation, occasional vomiting, inappetence, coughing and halitosis. Clinical examination revealed a respiratory rate of 44 breaths/min and mild pulmonary congestion on auscultation. Haematological, biochemical, thyroid and blood smear examinations were performed, along with thoracic and abdominal radiography. Complete blood count revealed leukocytosis with marked neutrophilia, while liver and kidney biochemical parameters were within the respective laboratory reference intervals. Thyroid evaluation revealed decreased total thyroxine (T_4 ; 0.8 µg/dL) and increased thyroid-stimulating hormone (T_{SH} ; 4.5 mU/L), consistent with hypothyroidism in conjunction with the clinical findings. Thoracic radiography demonstrated marked dilation and deviation of the oesophagus, consistent with megaesophagus. The dog was managed using levothyroxine for hypothyroidism, together with supportive therapy comprising metoclopramide, pantoprazole, sucralfate and amoxicillin-clavulanate. Dietary and feeding management, including small frequent meals and elevation of the feeding bowl, was also instituted. Following 10 days of treatment, appetite improved and the frequency of regurgitation decreased. After one month of levothyroxine therapy, repeat thyroid profiling showed normalization of the thyroid parameters. The present case highlights the importance of radiographic evaluation and assessment of underlying systemic disorders in dogs presenting with recurrent regurgitation and suspected megaesophagus.

Keywords: Dog, Megaesophagus, Hypothyroidism, Regurgitation, Labrador Retriever, Levothyroxine, Oesophageal dilation

Introduction

Megaesophagus is a disorder characterized by generalized or segmental dilation of the oesophagus accompanied by impaired oesophageal motility and reduced transport of ingesta toward the stomach. The condition may be congenital or acquired and can occur as a primary idiopathic disorder or secondary to systemic, neuromuscular or endocrine diseases. In many canine cases, no definitive underlying cause is identified and the condition is consequently classified as idiopathic megaesophagus (Kumar *et al.*, 2015) [1].

The major clinical manifestation of megaesophagus is regurgitation. Unlike vomiting, which is an active process generally associated with nausea, abdominal contractions and retching, regurgitation is a passive expulsion of undigested food, fluid or mucus from the oesophagus. Differentiation between these two clinical events is important because recurrent regurgitation strongly suggests an oesophageal disorder (Johnson *et al.*, 2009) [2]. Other clinical manifestations may include excessive salivation, dysphagia, halitosis, weight loss and respiratory signs secondary to aspiration pneumonia. Coughing and respiratory abnormalities may therefore occur as complications of recurrent aspiration.

Diagnosis of megaesophagus is primarily based on the clinical history and radiographic demonstration of oesophageal dilation. Thoracic radiography is particularly useful for confirming oesophageal enlargement and identifying concurrent pulmonary abnormalities. Once megaesophagus has been identified, further diagnostic investigation is required to identify potentially treatable underlying causes (Kook, 2013) [3]. Hypothyroidism is an endocrine disorder resulting from inadequate production or availability of thyroid hormones, particularly thyroxine (T_4) and triiodothyronine (T_3). Primary hypothyroidism accounts for the majority of naturally occurring cases in dogs and is commonly associated with lymphocytic thyroiditis or idiopathic thyroid atrophy (Le Traon *et al.*, 2009) [4]. Clinical manifestations may include lethargy, weight gain, dermatological abnormalities, alopecia, cold intolerance, bradycardia and, in some cases, neuromuscular abnormalities. Laboratory diagnosis is generally based on assessment of thyroid hormone concentrations, par

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ticularly total T_4 , in conjunction with thyroid-stimulating hormone (T_{SH}) concentration and compatible clinical findings (Dixon *et al.*, 1999) [5].

Although megaesophagus has several recognized causes, endocrine disorders including hypothyroidism have been reported in association with oesophageal dysmotility. Therefore, evaluation for underlying systemic and endocrine disorders may be warranted in dogs presenting with megaesophagus. The present case describes the clinical, haematological, biochemical and radiographic findings and therapeutic management of a Labrador Retriever diagnosed with megaesophagus concurrently with hypothyroidism.

Case presentation

Case history and clinical examination

A 3-year-old male Labrador Retriever was presented to the Veterinary Clinical Complex, Belgachia, Kolkata, West Bengal, with a history of regurgitation, occasional vomiting, inappetence, coughing and halito-

sis for approximately 7 days. On clinical examination, the rectal temperature was 101 °F, and the conjunctival mucous membranes were pink. The respiratory rate was 44 breaths/min. No abnormal cardiac sounds were detected on auscultation. Mild pulmonary congestion was detected during thoracic auscultation. Based on the history of recurrent regurgitation and respiratory signs, oesophageal disease with possible secondary respiratory involvement was considered. The dog was subjected to a complete blood count (CBC), liver function testing, kidney function testing, thyroid profile and peripheral blood smear examination for screening of haemoparasites. Radiographic examination of the thorax and abdomen was also performed.

Haematological findings

The CBC revealed leukocytosis with neutrophilia. Haemoglobin concentration, packed cell volume, erythrocyte count and erythrocyte indices were within the reported laboratory reference intervals. The recorded haematological parameters are presented in Table 1.

Table 1. Haematological parameters of the dog at presentation

Tests	Findings	Unit	Normal Value
Hemoglobin(Hb)	13	g/dl	11.0-19.0
TC	24.45	/cumm	(8.0-18.0)X10 ³
Neutrophils	86	%	50-84
Lymphocytes	08	%	8-38
Eosinophil	02	%	0-9
Monocytes	04	%	1-9
Basophils	00	%	0-1
HCT	37.3	%	35-50
PCT	28.8	%	5.8-91.1
RBC	7.2	million/cumm	5.5-8.5
MCV	66.2	fl	60.0-77.0
MCH	22.2	pg	19.5-27.0
MCHC	36.0	g%	30.0-38.0
PLT	17.5	/cumm	(11.7-46.0)x10 ⁴

The total leukocyte count was elevated, with neutrophils constituting a high proportion of the leukocyte differential. The peripheral blood smear examination did not reveal apparent haemoparasitic organisms.

Biochemical and thyroid profile

Serum biochemical examination revealed no marked abnormalities in the evaluated hepatic and renal parameters. Total bilirubin, direct bilirubin, indirect bilirubin, AST, ALT, alkaline phosphatase, total protein, albumin, globulin, creatinine, blood urea nitrogen and urea were within the reported laboratory reference intervals (Table 2).

The thyroid profile revealed a reduced T_4 concentration of 0.8 µg/dL compared with the reported reference interval. The T_{SH} concentration was 4.5 mU/L, which was above the stated reference interval. T_3 was 0.51 ng/mL and within the reported reference interval (Table 2). The combination of reduced T_4 and increased T_{SH} was considered supportive of primary hypothyroidism in the context of the clinical presentation.

Radiographic findings

Thoracic radiography revealed marked dilation and deviation of the oesophagus, consistent with megaesophagus (Figure 1). The radiographic findings, together with the predominant history of recurrent regurgitation, supported the diagnosis of megaesophagus.

Table 2. Serum biochemical and thyroid parameters at presentation

Tests	Findings	Unit	Normal Value
Total Bilirubin	0.2	mg/dl	0-0.4
Direct Bilirubin	0.06	mg/dl	0-0.1
Indirect Bilirubin	0.1	mg/dl	0-0.3
SGOT (AST)	36	u/l	9-49
SGPT (ALT)	106	u/l	8-125
ALKP	101	u/l	20-200
Total Protein	6.4	g/dl	5.5-7.5
Albumin	2.8	g/dl	2.6-4
Globulin	3	g/dl	2.1-3.7
Creatinine	1.2	mg/dl	0.6-1.6
Blood Urea Nitrogen	21.48	mg/dl	8.8-25
Urea	44	mg/dl	18.8-55.4
T_3	0.51	ng/mL	0.45-1.50
T_4	0.8	µg/dL	1.5-3.5
T_{SH}	4.5	mU/L	0.40-4.00

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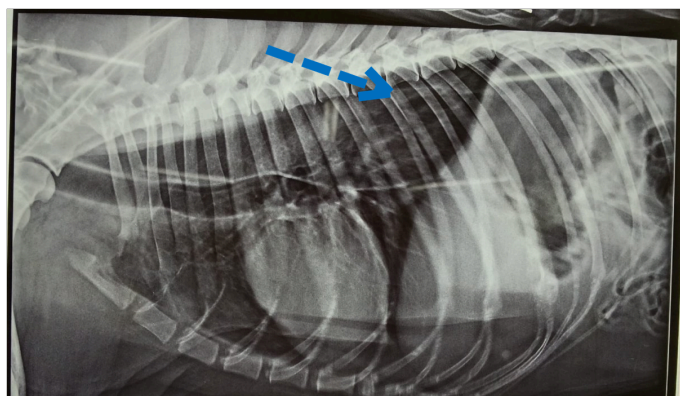


Figure 1. Lateral thoracic radiograph showing marked dilation and deviation of the oesophagus consistent with megaesophagus in a Labrador Retriever.

Treatment and follow up

The dog was managed using a combination of medical treatment and dietary modification. Levothyroxine was prescribed for correction of the diagnosed hypothyroidism. The dose recorded in the clinical case sheet should be verified before submission because accurate reporting of the administered dose is essential in a case report. For management of gastrointestinal clinical signs, metoclopramide was administered at 0.5 mg/kg body weight twice daily before feeding for 10 days. Pantoprazole was administered orally at 1 mg/kg body weight once daily on an empty stomach for 2 weeks. Sucralfate was administered at 500 mg to 1 g per dog twice daily before feeding for 10 days. Amoxicillin-clavulanate was administered orally at 15 mg/kg body weight twice daily for 10 days because of the respiratory findings and leukocytosis with neutrophilia. The treatment was intended to address possible secondary bacterial respiratory involvement.

In addition to medicinal treatment, dietary and feeding management was also advised. The owner was advised to provide small quantities of food at frequent intervals rather than a large meal at once. The feeding bowl was elevated to approximately the level of the dog's head to facilitate gravitational passage of food through the oesophagus. A liquid or appropriately modified diet was recommended according to tolerance.

Following approximately 10 days of treatment, the dog's appetite improved and the frequency of regurgitation episodes decreased. The clinical respiratory signs also improved.

After one month of levothyroxine therapy, thyroid function testing was repeated. The thyroid profile reportedly returned to within the laboratory reference intervals. The improvement in thyroid hormone status following levothyroxine therapy supported the diagnosis of hypothyroidism.

Discussion

Megaesophagus is characterized by generalized or segmental dilation of the oesophagus with impaired motility and ineffective transport of ingesta into the stomach. It may be congenital, acquired or idiopathic and can occur secondary to systemic, neuromuscular and endocrine disorders (Kumar *et al.*, 2015; Mace *et al.*, 2012) [1, 6]. In the present case, recurrent regurgitation was the predominant sign, accompanied by coughing, inappetence and halitosis. Unlike vomiting, regurgitation is a passive process originating from the oesophagus (Johnson *et al.*, 2009) [2]. The history of recurrent regurgitation and marked oesophageal dilation on radiography supported the diagnosis of megaesophagus.

Respiratory signs may occur in dogs with megaesophagus because of aspiration of regurgitated material. The present dog showed coughing and mild pulmonary congestion, along with leukocytosis and neutrophilia. However, these findings are nonspecific and, without definitive radiographic or microbiological evidence, cannot confirm bacte-

rial aspiration pneumonia. Nevertheless, the respiratory abnormalities warranted supportive treatment and monitoring for aspiration-associated complications.

Thoracic radiography is important for confirming oesophageal dilation and identifying associated thoracic abnormalities (Kook, 2013; Mace *et al.*, 2012) [3, 6]. In this case, lateral thoracic radiography demonstrated marked dilation and deviation of the oesophagus, consistent with megaesophagus. Liver and kidney biochemical parameters were within the laboratory reference intervals, providing no evidence of significant hepatic or renal dysfunction. A notable finding was the concurrent thyroid abnormality. Serum T_4 was decreased (0.8 µg/dL), while T_{SH} was increased (0.5 ng/dL); T_3 remained within the reported reference interval. Decreased T_4 with increased T_{SH} supports primary hypothyroidism when interpreted alongside compatible clinical findings and appropriate laboratory reference intervals (Dixon *et al.*, 1999; Le Traon *et al.*, 2009) [5, 4]. Normalization of the thyroid profile following levothyroxine therapy further supported the diagnosis.

The association between hypothyroidism and megaesophagus has been previously reported. Kumar *et al.* (2015) [1] described hypothyroidism-associated megaesophagus in dogs, while Ko *et al.* (2018) [7] reported improvement following treatment of concurrent hypothyroidism. Thyroid dysfunction may affect neuromuscular function and potentially contribute to impaired oesophageal motility. However, the mechanism remains uncertain, and concurrent hypothyroidism does not establish a definitive causal relationship. As specific neuromuscular investigations were not performed in the present case, the condition is appropriately described as megaesophagus associated with hypothyroidism.

Management of acquired megaesophagus involves treatment of the underlying cause, prevention of aspiration and maintenance of nutrition. Small, frequent meals and an elevated feeding position were advised in the present case to facilitate oesophageal emptying. Levothyroxine was administered for thyroid hormone replacement, which is the standard treatment for canine hypothyroidism (Le Traon *et al.*, 2009; Van Dijk *et al.*, 2014) [4, 8]. The thyroid profile normalized after one month of therapy.

Metoclopramide, pantoprazole and sucralfate were used as supportive medications. Metoclopramide provides prokinetic and antiemetic effects but has limited ability to restore oesophageal motility in established megaesophagus. Pantoprazole reduces gastric acid secretion, while sucralfate provides gastrointestinal mucosal protection (Bersenas *et al.*, 2005; Dowling, 1995) [9, 10]. Amoxicillin-clavulanate was administered because of the respiratory findings and inflammatory leukogram, with the aim of addressing possible secondary bacterial respiratory involvement.

Clinical improvement was observed after approximately 10 days, with improved appetite and reduced regurgitation frequency. Although encouraging, this response cannot be attributed solely to levothyroxine because dietary modification and several supportive treatments were administered concurrently. Nevertheless, normalization of the thyroid profile together with reduced regurgitation suggests that correction of hypothyroidism may have contributed to clinical improvement, consistent with previous observations (Ko *et al.*, 2018) [7].

Conclusion

The present case describes megaesophagus associated with hypothyroidism in a 3-year-old Labrador Retriever. Recurrent regurgitation, respiratory signs and thoracic radiography were important in establishing the diagnosis of megaesophagus, while thyroid profiling identified concurrent hypothyroidism. Appropriate management of the underlying endocrine disorder, together with supportive medication and feeding modification, resulted in improvement in appetite and a reduction in regurgitation frequency. The case emphasizes the importance of investigating potentially treatable systemic and endocrine disorders in dogs diagnosed with megaesophagus.

Acknowledgments

The authors thank to all the staffs and students of Veterinary Clinical Complex, WBUAFS, Belgachia, West Bengal, India for their assistance in the management of the case.

Conflict of Interest

Not available

Financial Support

Not available

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How to cite this article: Ghosal S, Bhowmik P, Rana T, Bala R, Sahoo B. Management of megaesophagus associated with hypothyroidism in a Labrador Retriever: A case report. *International Journal of Veterinary Sciences and Animal Husbandry*. 2026;SP-11(10):06-09. doi: <https://www.doi.org/10.22271/veterinary.2026.v11.i10Sa.3826>