Iranian Journal of Veterinary Surgery

CLINICAL REPORT

Atypical Megaesophagus Caused by a Nasopharyngeal Polyp in a Cat: A Case Report

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ARTICLE INFO

Article History:

Received: 19 June 2023
Revised: 17 September 2023
Accepted: 4 October 2023

Keywords:

Cat
Megaesophagus
Nasopharyngeal polyp
Virtual tracheoscopy
Traction/avulsion

ABSTRACT

A 6-month-old intact male domestic shorthair cat presented with a history of aphonia, vomiting, regurgitation, chronic purulent nasal discharge, and recurrent signs of respiratory infection. Radiographic examination revealed alveolar lung pattern and generalized megaesophagus at the thoracic and caudal cervical region. Additional examinations by computed tomography and virtual tracheoscopy revealed a large mass on the nasopharyngeal area that occupied about 90% of the tracheal lumen. With the aid of tracheostomy, the mass was removed with traction and sharp excision. According to histopathological findings the mass was diagnosed as nasopharyngeal polyp. A recheck examination performed a week later and the clinical manifestations of the megaesophagus were resolved and also three years later during a phone call, his owner reported he was doing well. To the best of the knowledge of the authors, megaesophagus following nasopharyngeal polyp is only reported in three other cats.

Introduction

Megaesophagus is defined as dilation and hypomotiltiy of the esophagus. Megaesophagus in cats is not common. It may be congenital or secondary to some neuromuscular disorders including myasthenia gravis, dysautonomia, esophagitis, and esophageal obstruction due to vascular ring anomalies, stricture, and foreign body. Additionally, megaesophagus can result from aerophagia caused by dyspnea or panting due to pharyngeal obstructions. The most noticeable clinical sign of megaesophagus is regurgitation. These patients suffer from nutritional deficiency and aspiration pneumonia and some other problems depending on the underlying disease. Diagnosis of megaesophagus is based on plain or contrast radiography, CT scan, and esophagoscopy. Acquired megaesophagus may regress by resolution of underlying cause.[1,2]

One of the conditions that result in pharyngeal obstructions is nasopharyngeal polyp. Nasopharyngeal polyps are non-neoplastic pedunculated overgrowths of the mucosa that frequently accompany allergic rhinitis. The cause is unknown; however, it can be congenital or infectious. Inflammatory polyps most commonly occur in cats younger than 2 years of age, however, cats between 2-5 years and older than 18 years old have been reported to be affected, but no predilection to any breed or sex has been observed. Nasopharyngeal polyps are most commonly unilateral. Most cats present for evaluation of dysphagia or upper respiratory signs, or they may present for signs of external otitis and occasionally, acute head tilt, nystagmus, or vestibular imbalance. Clinical signs may be present for months before evaluation.[3-7] For evaluation of nasopharyngeal polyp clinical examination, endoscopy, diagnostic imaging, and histopathology are valuable.[8]

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https://doi.org/10.30500/ivsa.2024.288897.1265

Polyp treatment include ventral bulla osteotomy (VBO), traction/avulsion, and lateral bulla osteotomy may be indicated depending on the location of the polyp, if a severe respiratory obstruction is present, a temporary tracheostomy may be necessary. Polyp recurrence is minimized following bulla osteotomy. Corticosteroids are recommended to reduce the risk of recurrence given the inflammatory nature of the disease.[9-12]

Case Description and Clinical Finding

A 6-month-old intact male Domestic short-haired (DSH) cat was presented to the small animal hospital of the University of Tehran with recurrent respiratory infection after antibiotic therapy with Amoxicillin/Clavulanic acid, anorexia, regurgitation, aphonia, poor body condition, and stunt growth. In early examinations, a very mild crackle sound was heard by auscultation and hear sounds were normal. Routine hematological and biochemical examinations revealed no abnormality.

On radiographic evaluations generalized thoracic and caudal cervical megaesophagus was detected with prominent tracheoesophageal strip sign. The stomach and almost all intestinal loops were distended with large amounts of gas opacities (Figure 1). This finding were most likely compatible with severe dyspnea or other anomalies namely vascular ring anomalies, stricture or secondary to some neuromuscular disorders. CT scan examination under general anesthesia revealed a round well-defined soft tissue attenuation in the nasopharynx with the widths, lengths, and height of 1.55 × 2.61 × 1.58 cm, which occupied about 80-90% of the lumen in its max size. There was also distention of the esophagus at the caudal aspect of the mass and an extension of soft tissue attenuation in the left eustachian tube and tympanic bulla associated with the thickening of the tympanic bulla wall without any destructive lesions at the region and brain stem (Figures 2 and 3). These signs confirmed the nasopharyngeal mass which was extended to the nasopharyngeal region associated with the extension of the left middle ear and otitis media. Then we reconstructed the 2D images to create 3D reconstruction images of the mass (with the software Horos v 3.3.6) as an aid for surgeons to evaluate the exact location, structure, and peduncle of the polyp (Figure 4).

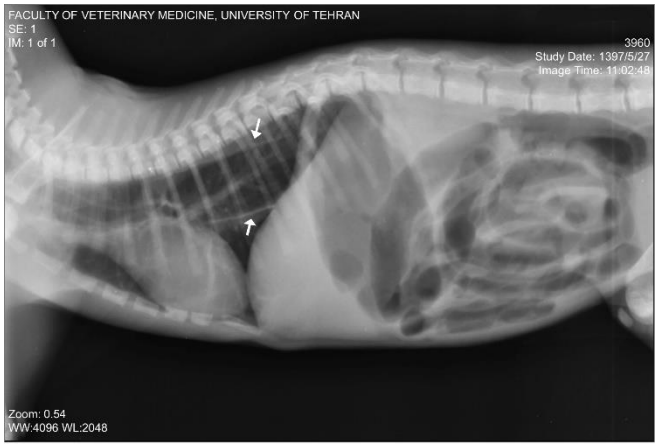

Figure 1. Lateral radiographic evaluations from laryngopharyngeal, cervical, thoracic, and cranial abdominal regions, generalized thoracic and caudal cervical megaesophagus has been detected with prominent tracheoesophageal strip sign (arrows). The Stomach and almost all intestinal loops have been distended with large amounts of gas opacities due to aerophagea.

Treatment and Outcome

Considering CT images and Virtual tracheoscopy/laryngoscopy results, the patient was anesthetized via intravenous injection of ketamine hydrochloride (10%, 15 mg/kg) and diazepam (0.5 mg/kg). The initial try for intubation of the patient was not successful therefore according to the size of the polyp and 90% of nasopharyngeal obstruction temporary tracheostomy was performed. The maintenance of the anesthesia was with Isoflurane. A traction and sharp excision of the polyp was performed and the mass submitted for histopathology in formalin 10% solution buffer. The patient was treated with tramadol (3 mg/kg OP), Cefazolin (22mg/kg IV, q 12 h, for a week), and Methylprednisolone sodium succinate (30 mg/kg IV and repeated at 15 mg/kg in 3 hours).

Histological samples stained with hematoxylin-eosin (H&E). The examination revealed a highly vascularized edematous fibrous tissue covered by both respiratory (prominent goblet cells and ciliated columnar epithelium) and stratified squamous epithelium. Subepithelial lymphoplasmacytic infiltration, deep parenchymal severe hyperemia, and hemorrhage, lymphoid follicle formation, multiple cyst-like structures covered by respiratory epithelium were other remarkable histopathological findings. Based on the clinical and histopathological findings the mass was diagnosed as nasopharyngeal polyp (Figure 5).

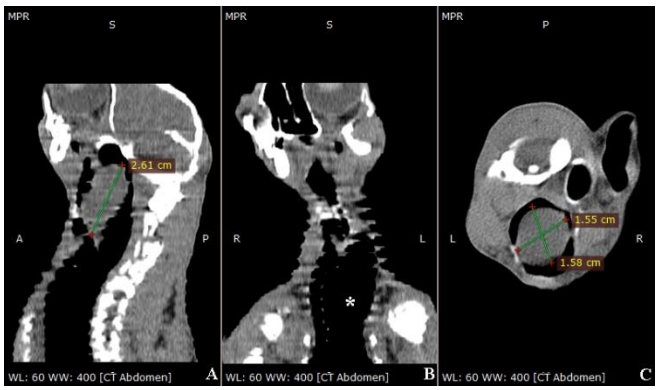

Figure 2. Longitudinal (A), dorsal (B), and transverse (C) plane reconstructed images of the skull and cervical region showed a round well defined soft tissue attenuation in the nasopharynx with widths, lengths, and height of 1.55 × 2.61 × 1.58 cm, which occupied about 80-90% of the lumen in its max size and cervical stenotic appearance of the trachea. Dilation of the esophagus (asterisk) is also evident.

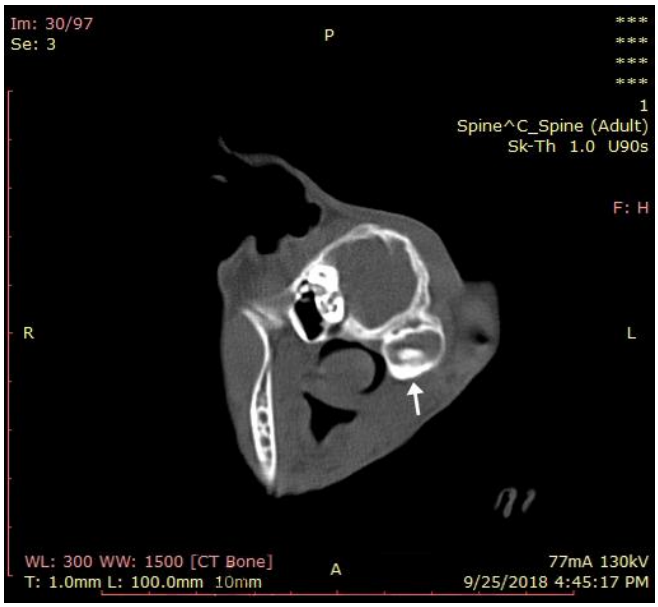

Figure 3. Transverse plane reconstructed images of the skull showed an extension of soft tissue attenuation in the left eustachian tube and tympanic bulla associated with the thickening of the tympanic bulla wall (arrows) without any destructive lesions at the region and brain stem. The ipsilateral auditory tube was intact.

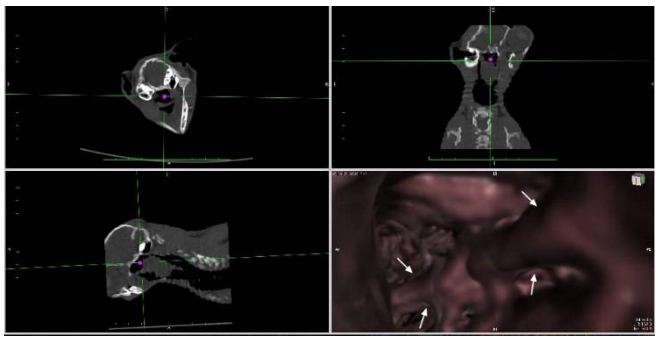

Figure 4. Virtual laryngoscopy from the rostral aspect of the polyp demonstrated its pedicle and the insertion (arrows).

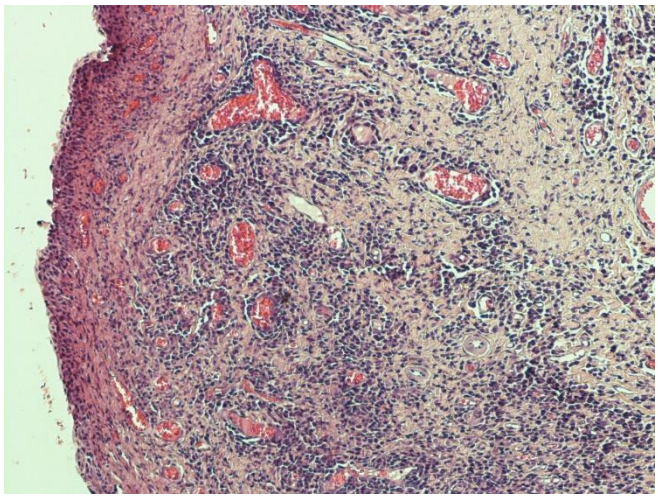

Figure 5. Histopathological appearance of the inflammatory nasopharyngeal polyp with a highly vascularized edematous fibrous tissue covered by goblet cells and ciliated columnar epithelium and stratified squamous epithelium and also sub-epithelial lymphoplasmacytic infiltration, deep parenchymal severe hyperemia, and hemorrhage, lymphoid follicle formation, multiple cyst-like structures covered by respiratory epithelium.

Recheck examination performed a week later post-operatively although the owner refused to take more radiographic examination, the clinical manifestations of megaesophagus and respiratory symptoms were resolved. Three years later during a phone call, the owner reported that the patient was doing well at home.

Clinical Relevance

Inflammatory polyps, after lymphoma, are the second most common cause of nasopharyngeal disease in cats, which are benign fibrous masses arising from the epithelium of the nose and paranasal sinuses.[5] One of the rare complications of nasopharyngeal polyps is megaesophagus as a result of partial pharyngeal obstruction and dyspnea.[11,13,14]

Based on our knowledge, megaesophagus resolution secondary to nasopharyngeal polyp removal is reported in three cases. According to their reports polyps were removed by traction at the first place but bulla osteotomy was performed afterwards due to recurrence of the polyp.[11,15,16] In this case although no other clinical examinations were performed to exclude other causes of megaesophagus, no abnormal heart sounds and murmurs or other abnormalities were noted so it was most likely caused by chronic obstruction leading to aerophagia and megaesophagus. In comparison to other cases, after polyp removal by incisional traction no sign of polyp recurrence detected as far as he was followed up in three years. However, no post-operation radiographs were taken to evaluate megaesophagus, regurgitation, respiratory symptoms, and aphonia were disappeared short time since surgery. So in cats with megaesophagus it is recommended to keep in mind to check for the blockage of upper respiratory airways as other probable causes of megaesophagus. In this situation the megaesophagus will resolve gradually if the obstruction is treated.[11]

Radiographs can be used to identify a soft-tissue mass in the nasopharynx and to evaluate the tympanic bulla. Computed tomography has the potential as an ideal imaging modality for supporting the diagnosis of inflammatory nasal polyps in cats which allows assessment of the external ear canal, tympanic membrane, osseous bulla, nasopharynx, and reformatting images in other planes, lack of superimposition, and good soft-tissue contrast resolution.[17]

One of the novel methods of visualization and measurement of the airway tree is virtual tracheoscopy and bronchoscopy which produces 3D images from planar 2D computed tomography or magnetic resonance (MR) images using surface or volume rendering.[18] Virtual endoscopy brings bronchoscopy like images of airways, but without information on mucosal color. These images along with CT images help to make a more definitive diagnosis pre and post operatively. Using this method in surgery procedures diminishes the complications of the surgery mainly for less experienced surgeons.[19-22]

Conflict of Interest

None to declare.

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