

A laryngeal inflammatory polyp in a miniature dachshund

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Abstract

A 15-year old, female miniature dachshund was presented for a 5-year history of progressive dyspnoea. A laryngeal mass was detected on cervical radiographs. Surgery was performed 5 days later to reduce the volume of the mass and to obtain biopsy samples; the dyspnoea improved. Based on the histopathological findings, the mass was diagnosed as inflammatory polyp. This case of inflammatory polyp in the larynx suggests that it should be listed in the differential diagnoses for laryngeal masses in dogs and that surgical treatment may be curative.

KEYWORDS

canine, dog, larynx

1 | INTRODUCTION

Laryngeal tumours are rare in dogs and account for 0.02% of all biopsy and necropsy cases (Mehrkens, Gorman, & Dores, 2019). However, they are an important cause of morbidity and mortality (Ramirez, Altimira, & Vilafranca, 2015; Yamate et al., 2011). Dogs with an obstructing laryngeal tumour typically present with clinical signs of inspiratory dyspnoea, cough, dysphagia and/or collapse (Ramirez et al., 2015).

A laryngeal mass can often be identified with radiographs as the air in the laryngeal lumen provides good contrast (Ramirez et al., 2015); computed tomography (CT) and laryngoscopy provide further information (Fox, 2007a; Rossi et al., 2007). CT imaging may also further aid the evaluation of local and distant metastases and depth of invasion (Fox, 2007a). Laryngoscopy is most helpful in evaluating the degree of laryngeal lumen obstruction and mass appearance and allows fine needle aspiration or biopsy of the mass to obtain a cytological or histological diagnosis. Reported treatment options for laryngeal tumours in dogs include surgical mass resection, endoscopic snaring and radiation therapy (North & Banks, 2009).

A wide variety of laryngeal tumours have been reported in dogs; however, carcinomas and striated muscle tumours are most common (Caserto, 2013; Mehrkens et al., 2019; Ramirez et al., 2015; Rossi et al., 2007; Yamate et al., 2011). In human medicine, inflammatory polyps in the larynx (known as vocal cord polyps) are the most common laryngeal mass. In dogs, polyps in the nasopharynx or tonsils have been reported, although they are very rare (Blutke, Parzefall, Steger, Goedde, & Hermanns, 2010; Greci & Mortellaro, 2016; Lucke, Pearson, Gregory, & Whitbread, 1988; Miller, Alcaraz, & McDonough, 2008). Rossi et al. described a polypoid mass in the vocal cord, which was diagnosed as a granular cell tumour (Rossi et al., 2007). To date, there have been no reports of inflammatory polyps in the larynx. This case describes the successful management of a laryngeal inflammatory polyp that caused partial airway obstruction in a dog.

2 | CASE SUMMARY

A 15-year old, 8.3-kg, spayed, female miniature dachshund was referred to the Okayama University of Science Veterinary Teaching

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Hospital with a 5-year history of progressively worsening dyspnoea. Three days before she was examined at our hospital, the referring veterinarian had administered prednisolone (1.0 mg/kg, SC) and ceftiofen sodium (8 mg/kg, SC) with no improvement of clinical signs.

Initial examination revealed moderate inspiratory and expiratory dyspnoea and increased inspiratory and expiratory sounds during laryngeal auscultation at rest. The symptoms progressed to severe expiratory dyspnoea under stress. There was no cough or nasal

discharge. The dog was tachypneic (respiratory rate, 60 breaths/min), normothermic (rectal temperature, 38.2°C), and had a normal cardiac rate (heart rate, 120 beats/min). Blood oxygen saturation on pulse oximetry was 88% (reference range, 97%–100%) under stress and 99% with supplemental oxygen. The results of the complete blood count and biochemical analyses were within the reference range. The coagulation profile and thoracic radiography tests were unremarkable.

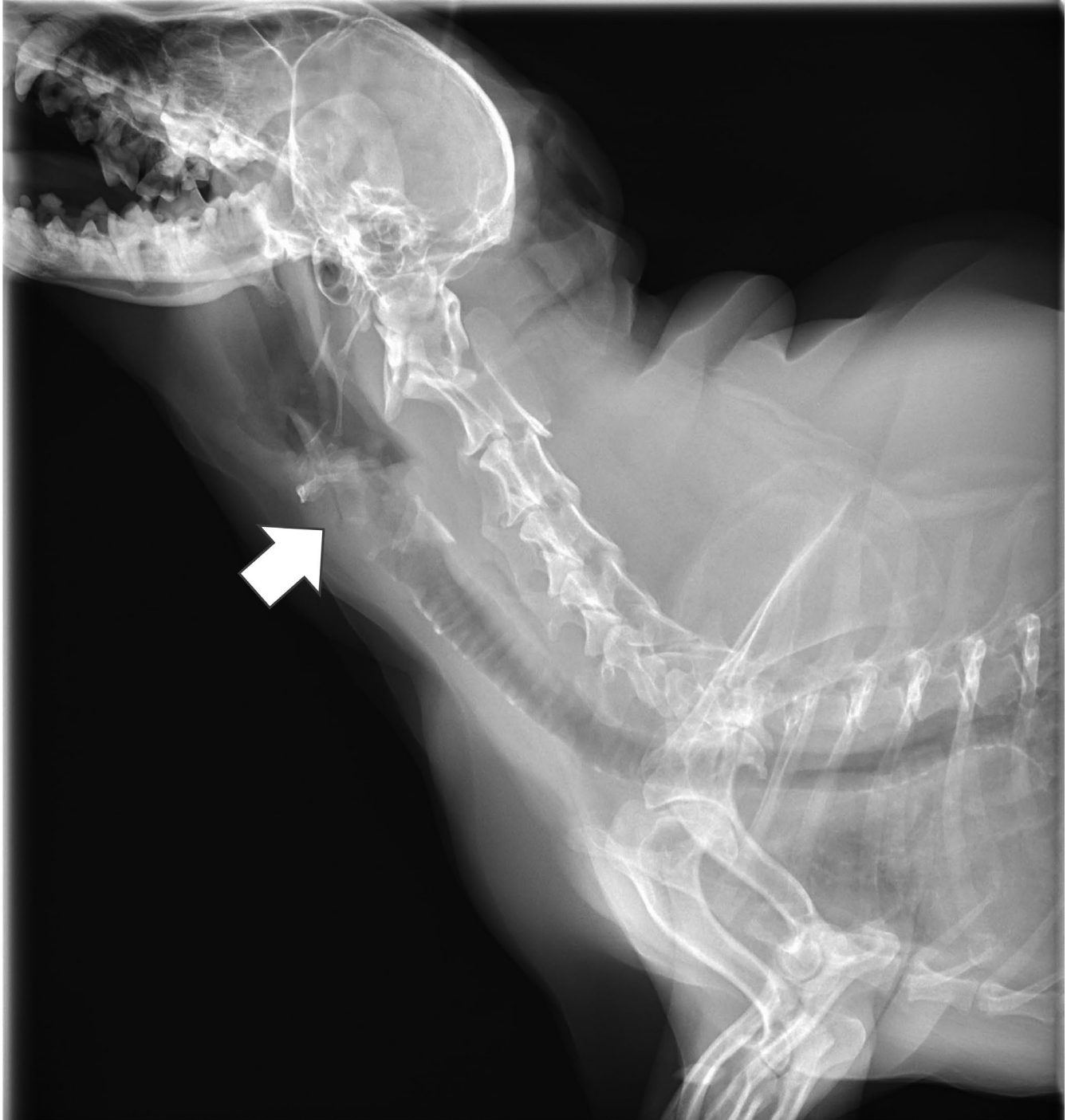


FIGURE 1 A soft tissue mass was evident in the area of the caudal larynx, and partially occluded the laryngeal lumen (arrow). The mass was not recognized in the ventrodorsal view

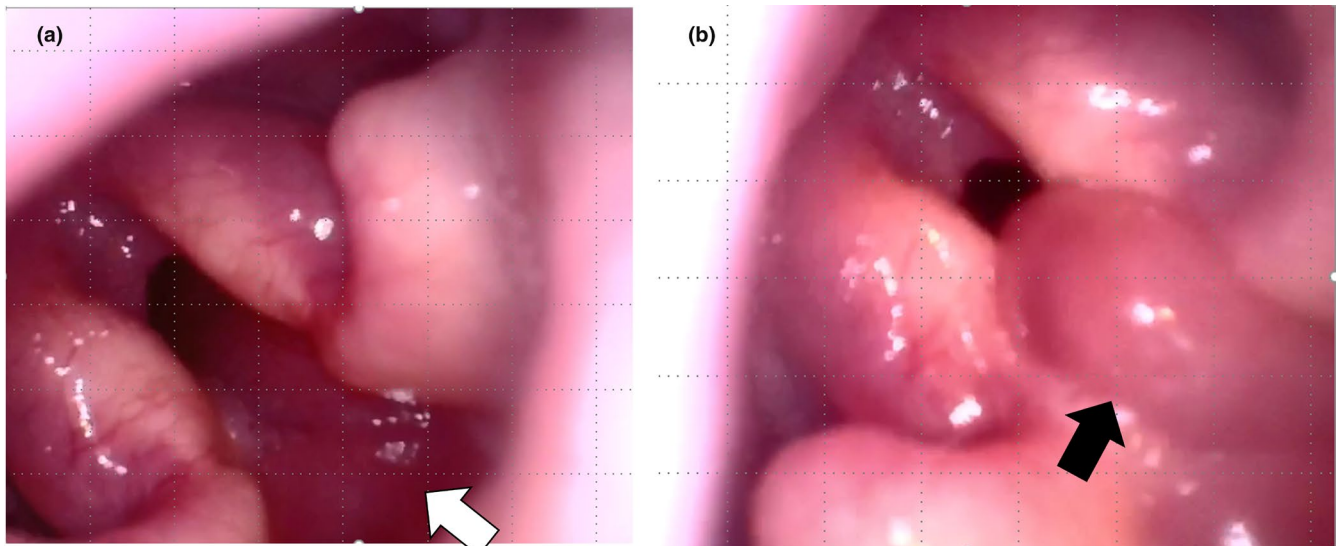


FIGURE 2 Laryngoscopic view of the mass in the area of caudal larynx. The surface of the mass was smooth. (a) The large mass disappeared in the subglottis with inspiration (white arrow). (b) The large mass appeared in supraglottis with expiration, and occupied almost the entire laryngeal lumen (black arrow)

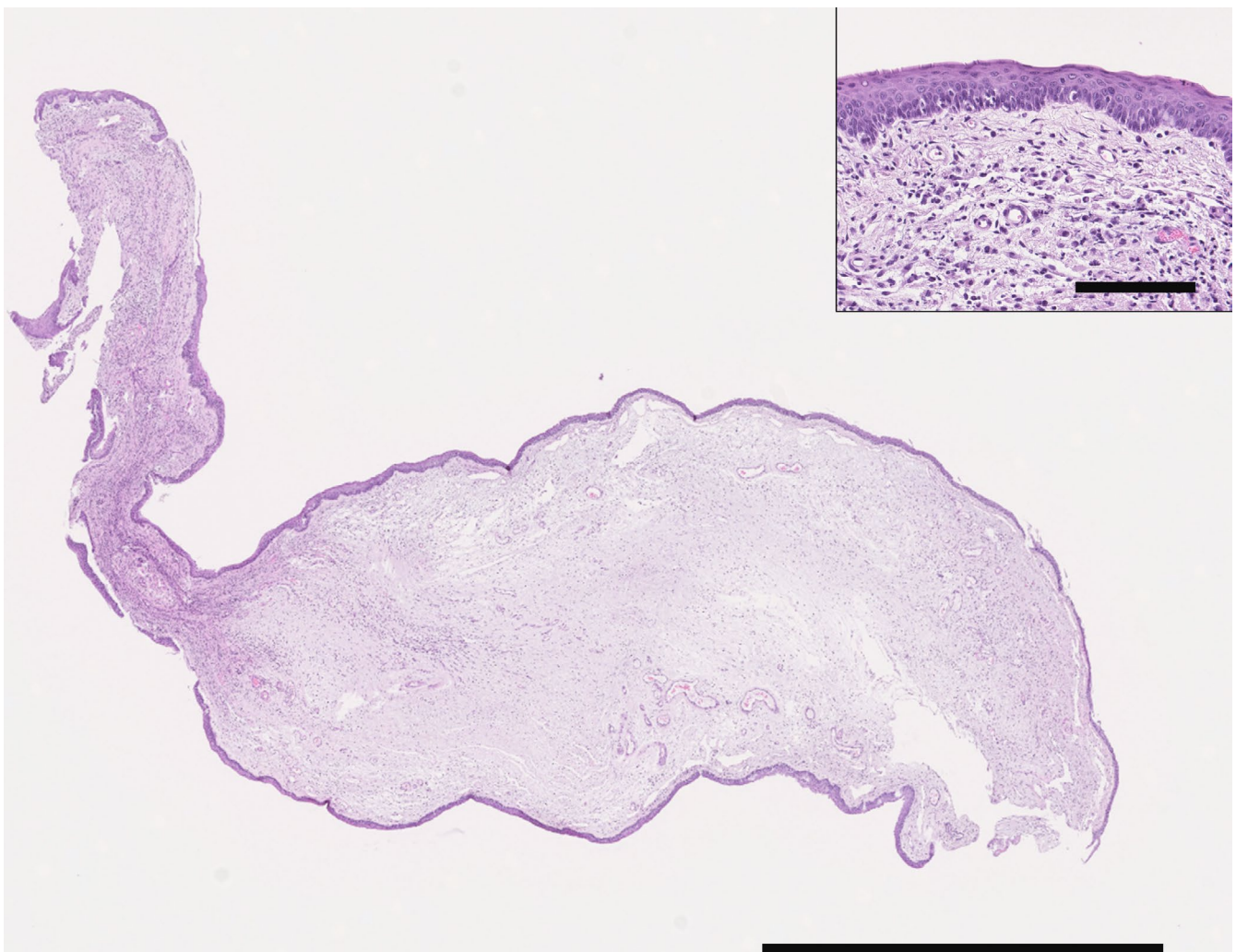


FIGURE 3 Subgross image of the laryngeal inflammatory polyp. HE. Bar = 2 mm. Inset: higher magnification ($\times 400$) showing the stratified squamous epithelium with no atypia or loss of polarity. HE. Bar = 100 μ m

In the right lateral cervical radiograph, a soft tissue mass (2.1 × 2.5 cm) was identified in the caudal larynx (Figure 1). Fluoroscopy revealed that the mass had a pedicle and moved upon breathing (Supp 1). It also revealed a cervical tracheal collapse, and the swallowing function, assessed by oral administration of amidotrizoate, was normal. Given the dog's clinical signs and radiographic findings, the primary differential diagnosis was a laryngeal mass.

After the initial examination, prednisolone was started (1 mg/kg, PO, SID), and the dog's movement at home was restricted. However, the symptoms did not improve remarkably; therefore, surgery was performed 5 days later to reduce the volume of the mass and to obtain biopsy samples.

The dog was pre-medicated with methylprednisolone (0.5 mg/kg, IV), medetomidine (2 µg/kg, IV) and butorphanol (0.3 mg/kg, IV). Anaesthesia was induced with propofol (4 mg/kg, IV) and maintained with a constant-rate infusion of propofol (0.12–0.36 mg kg⁻¹ min⁻¹). Intubation was not performed. The dog was placed in ventral recumbency and its neck was extended. The larynx was approached via the oral cavity using a laryngoscope and an endoscope. Approximately

80% of the airway was obstructed by the mass (Figure 2 and Supp 2). The mass arose from the ventral side of the subglottis, and was fragile with a smooth surface. The mass was roughly excised and aspirated to reduce the volume. Surgery cleared approximately 70% of the lesion with little haemorrhage. The mass was fixed in 10% neutral-buffered formalin and routine histopathological examination was conducted. The pedunculated mass was covered by stratified squamous epithelium without atypia or loss of polarity (Figure 3). The submucosa was composed of loose fibrovascular tissue with interstitial oedema and mild to moderate infiltration by lymphocytes, macrophages, neutrophils and plasma cells (Figure 4). No neoplastic change was identified in the submitted tissue. Histological diagnosis of inflammatory polyp was made based on the above-mentioned findings.

Postoperatively, prednisolone administration was continued (1 mg/kg, PO, SID) and was tapered gradually for a month. The dyspnoea improved and the blood oxygen saturation reached 99%. Four months after the operation the dog showed no clinical signs.

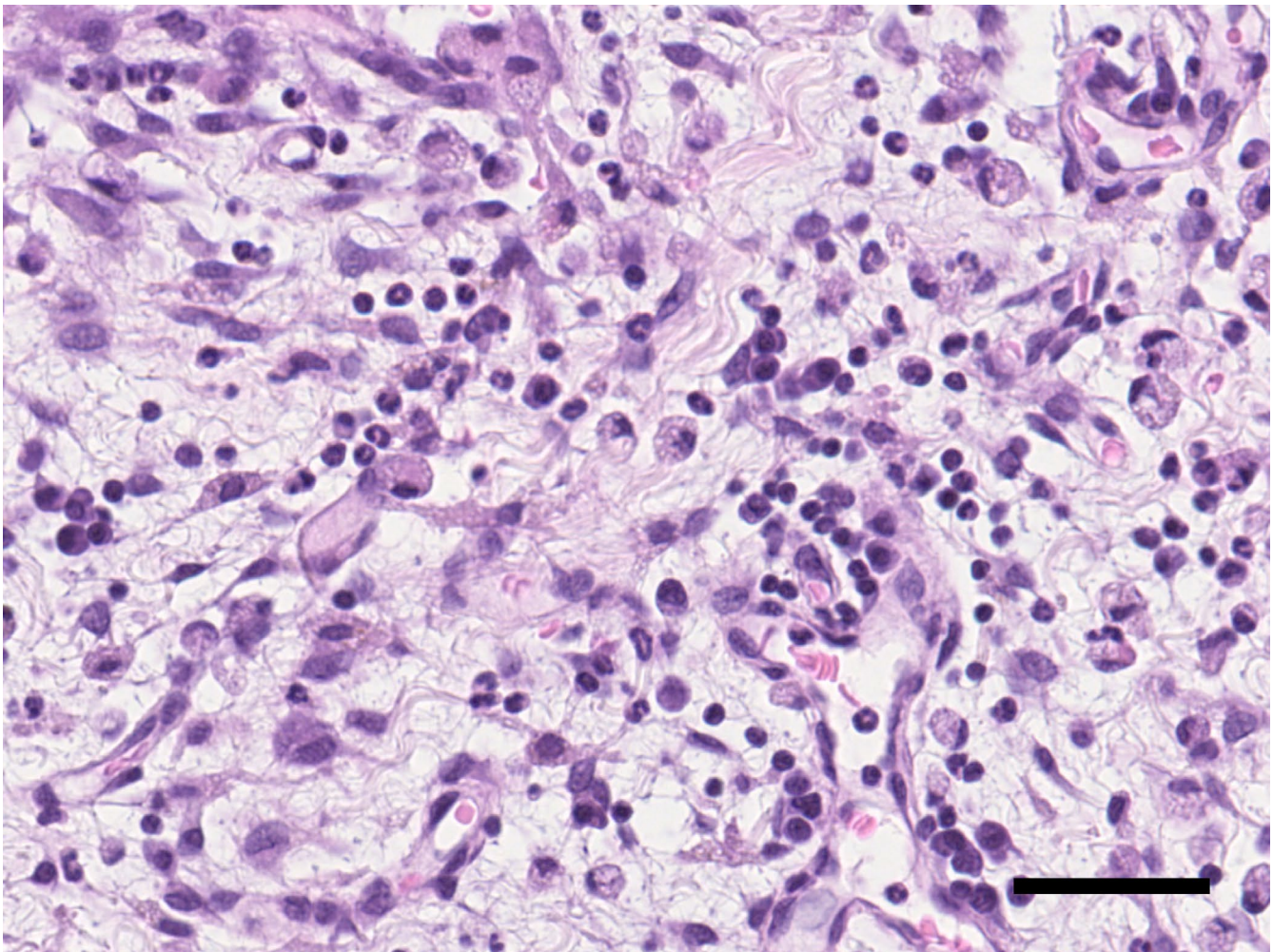


FIGURE 4 High magnification (×400) of the laryngeal inflammatory polyp. HE. Lymphocytes, macrophages, neutrophils and plasma cells infiltrate a loose fibrovascular tissue with interstitial oedema. Bar = 40 µm

3 | DISCUSSION

This is the first report about a laryngeal inflammatory polyp in dogs. In older dogs with dyspnoea, tracheal collapse and laryngeal paralysis are the most common aetiologies for upper airway disease (Fonfara et al., 2011). Laryngeal masses are rare in dogs (Ramirez et al., 2015).

Inflammatory polyps of the nasopharynx, larynx and trachea are protruding lesions composed of granulation tissue (Fan & de Lorimier, 2004; Fox, 2007b; Nicoll Madden, 2008). Inflammatory polyps are caused by infection, physical stimulation from foreign materials, irritant fumes, or are idiopathic. Clinically, it is extremely important to distinguish inflammatory polyps from malignant neoplasms to ensure correct treatment choice. Thoracic radiography is useful to assess the mass, larynx structures, and to find evidence of metastasis, but CT imaging yields more precise localization. Direct visualization of the larynx is most helpful for differentiating various laryngeal disorders. Tissue biopsy can also be performed under direct visualization. Histopathological examination is mandatory to obtain a final diagnosis of these mass lesions (Fox, 2007a).

Blutke et al. reported that polyps in the nasopharynx are composed of a fibrous connective tissue stroma with discreet infiltration of inflammatory cells and are covered by a partially ciliated epithelium (Blutke et al., 2010). Although the histological findings of this study were similar to the previous report, the polyp in this case was covered by stratified squamous epithelium. Lucke et al. reported tonsillar polyps in dogs (Lucke et al., 1988), and Miller et al. described a tonsillar lymphangiomatous polyp in a dog (Miller et al., 2008). In this case, findings suggestive of tonsillar polyps, for example dilated lymphatic channels or variable lymphocytic components, were not detected. These findings also support the idea that the inflammatory polyp arose in the subglottis.

In human medicine, laryngeal polyps rarely present with airway obstruction, and in some cases can improve without treatment (Tsunoda et al., 2004). However, if the polyps obstruct the airway, severe symptoms can occur. Therefore, early tracheotomy is recommended. In humans, steroids have been reported to be effective in some cases (Campagnolo, Tsuji, Sennes, & Imamura, 2008), but such effects are unknown in dogs.

In the dog reported here, the mass was likely the underlying cause of airway obstruction and dyspnoea. Nonetheless, the predicted diagnosis was of a polyp or a benign tumour because (a) the disease progression was slow, (b) the mass was observed to have a pedicle, and (c) the mass incompletely obstructed the airway, as seen with fluoroscopy images. Thus, a tracheotomy was not performed as early as it should have been. After initial treatment with medication, volume-reduction surgery to reduce the mass volume and to obtain biopsy samples was performed. Because it was difficult to intubate the dog, total intravenous anaesthesia was induced with spontaneous breathing. We also planned to approach the mass via the main trachea but could not obtain the owner's consent for this surgical approach. The causal factors of the inflammatory polyp could not be established; nonetheless, medical examination, radiography

and fluoroscopy were instrumental in rapidly diagnosing and aiding treatment for the inflammatory polyp in this dog. Laryngeal polyps rarely cause clinical signs, and are mostly identified as an incidental finding. However, as in this case, clinical signs occurred depending on size of the polyps. Laryngeal polyps should be considered as a differential diagnosis of dyspnoea.

CONFLICTS OF INTEREST

No conflicts of interest have been declared.

AUTHOR CONTRIBUTION

Keisuke Sugimoto: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Supervision; Visualization; Writing-original draft; Writing-review & editing. **Tepei Kanda:** Conceptualization; Data curation; Formal analysis; Methodology; Project administration; Resources; Visualization; Writing-original draft; Writing-review & editing. **Ikki Mitsui:** Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Resources; Visualization; Writing-original draft; Writing-review & editing. **Masahiro Miyabe:** Conceptualization; Data curation; Formal analysis; Writing-original draft; Writing-review & editing. **Noritaka Maeta:** Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Supervision; Visualization; Writing-original draft; Writing-review & editing.

ETHICAL STATEMENT

The authors confirm that the ethical policies of the journal, as noted on the journal's author guidelines, have been adhered to. No ethics approval was required as no experimentation was conducted on the treated dog and the consultation was conducted normally.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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