Infiltrative laryngeal lipoma in a Yorkshire Terrier as cause of severe dyspnoea

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Key words
Laryngeal paralysis, laryngeal tumour, neoplasia

Summary
A 10-year-old Yorkshire Terrier with suspected laryngeal paralysis was referred for further examination and surgical treatment. The dog displayed severe dyspnoea and dysphonia. Ventrolateral to the larynx a soft-elastic mass of 2 cm diameter was palpated and confirmed by radiography. Histopathological examination of the resected mass revealed an infiltrative lipoma/lipoma. Although the dog totally recovered after surgery, the prognosis remains guarded due to the high risk of a recurrence. Tumours of the larynx in general and an infiltrative lipoma specifically should be added to the list of differential diagnosis in dogs presented with clinical signs that could be misinterpreted as laryngeal paralysis.

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Introduction
Progressive respiratory distress due to upper airway disorders in older dogs is often associated with laryngeal paralysis (2, 6, 12, 19, 25). Another common upper airway disease causing dyspnoea is tracheal collapse (11). Tumours originating from the laryngeal or perilaryngeal tissues are not common in dogs and only a few case reports exist mainly about laryngeal rhabdomyoma (7, 8, 26). However, tumours of the laryngeal tissue can cause severe dyspnoea and may be difficult to diagnose. If surgical removal is possible, benign tumours of the larynx may have a good prognosis (14, 23).

Lipomas are benign tumours of the adipose tissue and are common in older dogs. Usually lipomas are asymptomatic as long as they do not lead to compression or impairment of organs (17). Lipomas are mostly well defined, but infiltrative lipomas can occur. These behave locally aggressive and differentiation from simple lipomas by cytology is not possible.

Case presentation
Patient and history
A 10-year-old, 7 kg, spayed female Yorkshire terrier was referred for further investigation of a suspected laryngeal paralysis. The owner reported progressive dyspnoea for approximately 4 weeks and an inspiratory sound. Both were more severe during exercise. During the last week an additional dysphonia developed. The dog had received Amoxicillin clavulanic acid (12.5 mg/kg BID) and prednisone (0.5 mg/kg BID) for one week, which did not result in improvement of the condition.

Clinical examination
The clinical examination revealed a body temperature of 38.9 °C, mild dyspnoea and tachypnoea (30 breaths/min). There was an obvious upper respiratory sound during in- and expiration. Additionally the voice of the dog was markedly hoarse. Auscultation of
the lung and heart was normal. Mucous membranes were pink and moist, the capillary refill time was < 2 s and the peripheral pulses were strong. The heart rate was 120 beats per minute. The nutritional status of the dog was normal. Peripheral lymph nodes and abdominal palpation were unremarkable. On palpation a soft-elastic swelling with a diameter of 2 cm was detected at the ventral and right side of the larynx.

Diagnostic measures

Intravenous catheter blood was taken for a complete blood count as well as serum biochemistry, the results of which were within normal ranges. A right lateral thoracic radiograph including the cervical spine showed a radiopaque approximately 2 × 2 cm measuring structure at the level of the larynx corresponding to the palpated mass (Fig. 1). The cardiac silhouette was normal, the vertebra heart size was 9.5 (reference value 8.5–10.5), and the lung fields were unremarkable.

It was unclear if the identified mass was responsible for the respiratory abnormalities or if an additional laryngeal paralysis was present. Therefore, a laryngoscopy was performed. Following mild sedation of the dog (midazolame, 0.1 mg/kg i. v., and propofol by effect) the movement of the larynx was examined with a laryngoscope for seven breathing circles. The abduction in inspiration and the adduction in exspiration of the arytenoid cartilage was symmetric and normal indicating that there was no evidence of laryngeal paralysis. However, a right sided extraluminal compression of the trachea reducing its size to 50% of the diameter was visible. A fine needle aspiration of the mass was declined by the owners, but a surgical exposure of the mass was carried out.

Surgical therapy and outcome

The dog was anaesthetised with levomethadon (0.1 mg/kg) and propofol to effect and inhalation anaesthesia was maintained using isoflurane. During intubation deformation and displacement of the trachea to the left was visible.

The dog was placed in dorsal recumbency and the neck was slightly turned towards the left. A ventral midline approach to the larynx was performed. The lingual vein with hyoid arch and submental branch were identified and preserved. Dissection of the sternohyoideus muscles was performed and prolapse of the right sternohyoideus muscle was visible. Further dissection of the sternohyoideus muscles at the level of the swelling revealed a white, soft elastic 2 × 2 cm mass, which was removed by a combination of blunt and sharp dissection (Fig. 2) followed by routine wound closure.

Postoperative lateral radiographs of the neck confirmed macroscopic evidence of complete removal of the mass (Fig. 3). Recovery of the dog was uneventful and the patient was discharged 2.5 days postoperatively. During hospitalisation the dog displayed only a mild inspiratory stridor during excitement and intermittent dry coughing (5–6 times daily) but no improvement of its voice.

The dog was presented 4 days after discharge for routine wound review. The owner reported that there were no abnormal respiratory sounds and that the coughing had improved. The voice of the dog had changed to almost normal. At removal of the stitches 10 days after surgery the voice was normal and coughing had decreased to 1–2 times per day. A routine re-examination of the dog 3 months postoperatively showed no abnormalities and it was impossible to induce coughing.
Histopathological examination of the mass revealed a mature fat cell tissue with infiltration of skeletal muscle tissue mainly in the periphery of the mass. The fat tissue extended to the margins in almost all planes so that the total extirpation of the mass remained unclear (▶ Fig. 4). The neoplasia was diagnosed as a lipoma suggestive of an infiltrative lipoma.

Discussion

Tumours of the laryngeal or perilaryngeal tissue are uncommon in dogs. To the authors’ knowledge there is only one report of a lipoma representing a canine laryngeal mass (30). In humans laryngeal lipomas are rare and account for only 0.1% of all benign laryngeal tumours (16). Reports on a lipoma/infiltrative lipoma in canines at the laryngeal tissue causing severe upper airway problems in particular respiratory distress and voice changes with clinical signs comparable to laryngeal paralysis are not available.

The combination of respiratory distress and dysphonia might have led to the suspected diagnosis of laryngeal paralysis by the referring veterinarian. Laryngeal paralysis usually occurs in older medium to giant breed dogs probably with an increased frequency in male dogs and is very uncommon in small breed dogs (12, 15, 18). The presented patient displayed a laryngeal sound in both the inspiratory and expiratory phases of respiration. Usually a biphasic respiratory sound can only be noticed in severely dyspnoeic dogs (34). Besides laryngoscopy there are more diagnostic procedures, e.g. echolaryngography, for confirmation of laryngeal paralysis, nevertheless laryngoscopy seems to be the most reliable procedure (28). In this case the dog showed normal laryngeal function under light sedation and a laryngeal paralysis could be ruled out.

Tumours originating from the laryngeal or tracheal tissue are rare in dogs (7). Single case reports of various tumours such as rhabdomyoma, carcinoma, squamous cell carcinoma, oncocytoma, plasmacytoma and mast cell tumours exist, as well as a case of a granular cell tumour of the vocal cord. Both malignant and benign neoplasias in this region can lead to severe respiratory symptoms including stridor, dyspnoea, wheezing and coughing and additionally changes or loss of voice (2–4, 7, 8, 11, 13, 14, 26, 32, 33, 35). Other diseases may show similar clinical symptoms. Inflammatory myopathies, tracheal collapse or a laryngeal cyst are described in the literature (9–11, 29).

Lipomas are benign, usually asymptomatic tumours of adipose tissue in older dogs (17). They may cause clinical dysfunction secondary to compression or strangulation of the adjacent tissue (22, 27). Infiltrative lipomas are composed of well-differentiated adipose cells without evidence of anaplasia and differentiation from well-defined lipomas is difficult. They are considered to be benign because they do not metastasize (1). However, infiltration of muscle, fascia, and occasionally bone is reported (1, 5, 24, 31). In the present case mature fat cells in all planes up to the margins of the mass were identified histopathologically. Furthermore there were skeletal muscle fibres within the margins of the mass. These findings combined with the location of the neoplasia were highly suggestive of an infiltrative lipoma.

In other locations infiltrative lipomas have recurrence rates up to 36–50% even with extensive surgical resection (1, 20). Unfor-
Conclusion for practice

Infiltrative lipomas of the larynx specifically and laryngeal tumours in general are rare in small animal practice. However, they should be considered as a differential diagnosis in cases with upper respiratory distress that could be misinterpreted as laryngeal paralysis.

Unfortunately, in this case a surgical resection with compartmental margins was not possible due to the location of the mass leading to a guarded prognosis in this dog.

During the follow-up period respiration and the voice of the dog normalized. However, due to the risk of an infiltrative lipoma and the doubtful total resection of the mass the prognosis is guarded. Infiltrative lipomas are usually treated surgically with aggressive excision (1). One study reports surgical excision combined with radiation therapy for the management of infiltrative lipoma in 13 dogs but information on the outcome of these tumours is missing (21).

Conflict of interest

The authors confirm that they do not have any conflict of interest.

References