

Case Report

Glomus tumour of the trachea: a rare case

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ABSTRACT

This case report presents a rare case of a benign tracheal glomus tumor in a 48-year-old male who presented with progressive cough and dyspnea. Imaging revealed a proximal tracheal mass causing partial airway obstruction, and bronchoscopy demonstrated a highly vascularized lesion. Due to the risk of bleeding, biopsy was not performed, and PET/CT findings supported a benign etiology. The tumor was excised via a cervical approach, and histopathological examination confirmed a benign glomus tumor with typical immunohistochemical features. Postoperative recovery was uneventful; no recurrence was observed during one year of follow-up. This case highlights the diagnostic challenges of tracheal glomus tumors, the importance of imaging and surgical flexibility in management, and the favorable prognosis achievable with complete surgical resection and vigilant long-term follow-up.

Keywords: glomus tumor, tracheal neoplasms, airway obstruction, bronchoscopy

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Introduction

Glomus tumors are rare neoplasms that most commonly occur in the upper extremities [1]. These tumors originate from glomus bodies, mesenchymal structures responsible for thermoregulation. While they are typically found in the subungual region, glomus tumors have also been reported in unusual extraneous sites such as the stomach, abdominal wall, mandible, and bronchi [2-4].

Glomus tumors arising within the airway are exceedingly rare, with only a limited number of cases described in the literature. A recent literature review has shown that there were 77 published articles on tracheal glomus tumors in the English-language medical literature up to 2020 [5]. They usually occur in the upper and middle portions of the trachea, where they lead to airway obstruction. The rarity of these tumors in the trachea creates diagnostic challenges, as their symptoms such as cough and dyspnea are nonspecific and often mimic more common respiratory disorders. In these patients, imaging modalities such as computed tomography, bronchoscopy, and PET-CT are commonly utilized to evaluate the lesion and its extent within the airway. The low FDG uptake of glomus tumors on PET/CT may help differentiate them from other malignant neoplasms; however, the definitive diagnosis of glomus tumors is based on histopathological examination and immunohistochemical staining.

In this report, we present a case of a 48-year-old male initially misdiagnosed with a tracheal papilloma, in whom surgical excision confirmed a glomus tumor. This case emphasizes the need to consider glomus tumors among the differential diagnoses of tracheal lesions and highlights the curative potential of complete surgical resection.

Case Report

A 48-year-old male, with a history of Behcet's disease and no comorbidities or smoking history, presented to pulmonology clinic with a persistent cough and increasing exertional dyspnea. The patient reported these symptoms had increased over the past six months and were impacting his quality of life. Physical examination was unremarkable.

Behcet's disease is a systemic disease that can affect the vascular system. The literature presents data showing that the disease causes vascular involvement and inflammatory processes in the airways and lungs. The patient's complaints could be related to this. Given the severity of his symptoms, further diagnostic workup was warranted.

The initial thoracic computed tomography (CT) scan revealed a 15x10 mm soft tissue mass in the proximal trachea (Figure 1). The lesion was located approximately 2 cm below the vocal cords and partially obstructed the

tracheal lumen. The patient was subsequently referred to our thoracic surgery clinic for further evaluation. Flexible bronchoscopy demonstrated a highly vascularized polypoid lesion arising from the posterior membranous wall of the trachea, causing nearly 50% luminal narrowing. Bronchoscopic biopsy was considered high risk and therefore not performed for previous case reports showing that massive bleeding has been encountered during biopsy of highly vascular tracheal tumors [5]. To further characterize the lesion, a positron emission tomography/computed tomography (PET/CT) scan was obtained, revealing minimal fluorodeoxyglucose (FDG) uptake with a maximum standardized uptake value (SUVmax) of 2.34, consistent with a benign process. Despite the imaging findings, the patient's persistent respiratory symptoms warranted surgical intervention.

The patient underwent an open surgical excision via a cervical collar incision. Intraoperatively, the tumor was found to be arising from the posterior tracheal wall at second tracheal cartilage ring. The tumor was only dissected from the posterior tracheal wall with sharp dissection for the tumor was located in the superior trachea, no deep infiltration, and no submucosal extension was detected. The lesion was excised en bloc without complications. Intraoperative frozen section analysis revealed no evidence of malignancy and there was no need for further tracheal resection.

The resected specimen was subjected to histopathological examination, revealing a neoplasm composed of uniform cells with round nuclei and eosinophilic cytoplasm surrounding numerous blood vessels. There was minimal cellular atypia and a low mitotic index (Figure 2). Immunohistochemical staining showed strong positivity for smooth muscle actin (SMA) and H-Caldesmon, with weaker staining for Desmin. The Ki67 proliferation index was below 5%, consistent with a benign glomus tumor.

Benign glomus tumors are histologically monotonous, with low mitotic activity and uniform cells; malignant glomus tumors show mitosis with atypical mitotic figures or marked nuclear atypia. Although the immunohistochemical profile (SMA and h-caldesmon positivity) is generally common in all glomus tumors, a low Ki-67 index and the absence of atypical cytological features characterize benign tumors [6].

Postoperative recovery was uneventful. Follow-up bronchoscopy performed one week and four months after surgery showed no evidence of tumor recurrence (Figure 3). The patient remained symptom-free with no signs of recurrence at the one-year follow-up. Informed consent was obtained from the patient for publication of this case report and accompanying images.



Figure 1. Preoperative axial CT imaging shows a tumor narrowing the trachea by %50 (a), preoperative sagittal CT imaging shows that the tumor originates from the posterior wall of the trachea (b).

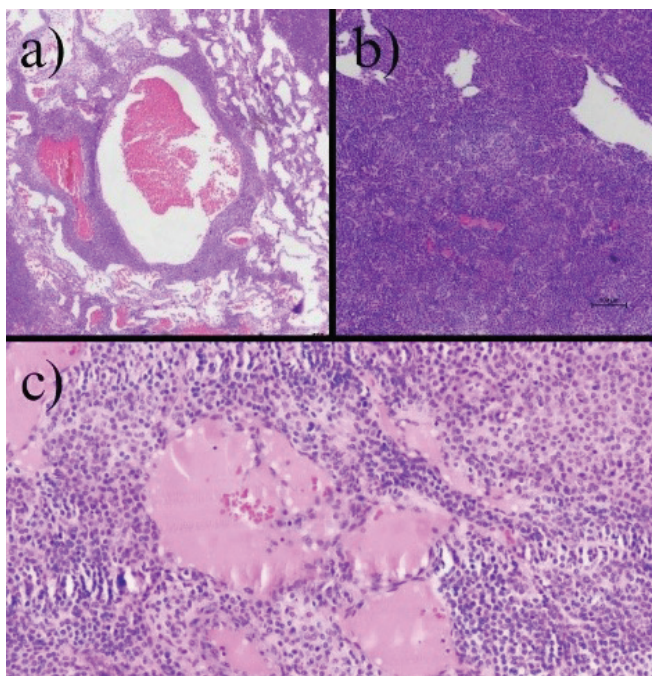


Figure 2. At low magnification, layers of glomus cells surrounding the vascular spaces can be observed, HEx40 (a), glomus cells with round nuclei, eosinophilic cytoplasm, and minimal atypia are observed to solid growth pattern, HEx100 (b), round nuclei with indistinct borders, eosinophilic cytoplasm, minimal atypia, and low mitotic activity glomus cells are observed HEx200 (c).



Figure 3. Bronchoscopy performed in the 4th month postoperatively shows no signs of recurrence.

Discussion

Tracheal glomus tumors present significant clinical and pathological challenges in diagnosis due to their rarity. In the present case, several important aspects were observed. Firstly, because the symptoms overlapped with other respiratory conditions, imaging studies played a crucial role in detecting the lesion and assessing its extent. Secondly, the lesion appeared highly vascularized during bronchoscopy, which modified the diagnostic and therapeutic approach. Instead of performing a high-risk biopsy, a PET-CT scan was obtained. Low SUVmax value (2.34) is consistent with benign glomus tumors based on previously reported cases. Surgical excision through tracheotomy was performed. The intraoperative frozen section confirmed removal of the tumor with clear surgical margins, emphasizing the importance of flexibility in diagnostic and treatment planning. Finally, histopathological evaluation revealed an exceptionally rare diagnosis, leading to a review of the literature and implementation of a long-term follow-up strategy.

Complete surgical excision with clear margins is essential to prevent local recurrence and achieve long-term disease control. The selection of the surgical approach should be individualized according to the tumor's size, vascularity, and precise tracheal location. In reported cases, techniques such as rigid bronchoscopic resection, tracheotomy, segmental resection, or sleeve resection have been successfully employed, each with

specific indications and limitations [2]. Rigid bronchoscopic resection is less invasive but carries a high risk of bleeding and local recurrence. Segmental or sleeve tracheal resection is generally curative for preventing local recurrence, especially in cases with deep invasion. However, it is a major surgical procedure. It carries a risk of serious postoperative complications such as anastomosis leak and tracheal stenosis.

Intraoperative frozen section examination may be valuable, confirming complete tumor removal and guiding the extent of resection when malignancy cannot be excluded. For this case, open surgical excision via a cervical approach provided optimal exposure and ensured complete resection without the need for segmental tracheal reconstruction.

The prognosis for benign glomus tumors is generally favorable, with low recurrence rates following complete surgical excision. Nevertheless, long-term follow-up remains essential to detect potential recurrence or malignant transformation. Although glomus tumors are predominantly benign, rare cases with malignant behavior have been reported; therefore, regular postoperative surveillance using bronchoscopy and imaging is recommended.

Given the rarity of these tumors, further case reports are needed to improve understanding of their biological behavior, optimal treatment strategies, and long-term outcomes. This case reinforces the importance of including glomus tumors in the differential diagnosis of tracheal masses, highlights the value of a multidisciplinary approach in diagnosis and treatment, and emphasizes the necessity of follow-up to ensure favorable patient outcomes.

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Authors' contribution

All authors contributed to the conception, data collection, writing, and final approval of the manuscript.

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