BJCR
Brazilian Journal of Case Reports

PCAA
Publicações Científicas de Acesso Aberto

Case Report

Glomus Tumor in the Tracheal Region: Case Report

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Abstract: This report presents a rare case of a glomus tumor in the mediastinal trachea. A 53-year-old man with tracheal stenosis underwent invasive procedures until the discovery of a benign tracheal lesion in the form of a glomus tumor. Diagnosis was made through bronchoscopy and chest tomography, and the patient was treated surgically with bronchoscopy and cryoablation. After recurrence, a mediastinal tracheoplasty was performed. In addition to the rarity of this type of tracheal lesion, we found it important to report this case, as remembering glomus tumor in benign lesions may assist the medical community involved in treating this condition in making the correct therapeutic decisions for this surgical pathology.

Keywords: Glomus Tumor; Tracheal Tumor; Mediastinal Tracheoplasty.

Citation: Souza LRF. Glomus Tumor in the Tracheal Region: Case Report. 2025 Jan-Dec;05(1):bjcr28.

https://doi.org/10.52600/2763-583X.bjcr.2025.5.1.bjcr28

Received: 9 September 2024
Accepted: 6 September 2024
Published: 17 October 2024

1. Introduction

Glomus tumors are perivascular tumors, with the primary site being the nail bed, although they may also be present in the hand, wrist, forearm, and foot, and less frequently in the chest wall, bone, stomach, colon, nerves, nose, trachea, and mediastinum [1]. These are perivascular tumors whose cells resemble modified smooth muscle cells of the glomus body [2]. In the context of a glomus tumor in the trachea, they may be distributed throughout the trachea; however, they are typically more localized in the lower third of the trachea, with lesions on the posterior tracheal wall. Most are endoluminal, but extratracheal cases have been reported [3].

The clinical manifestations of glomus tumors in the trachea depend on the location, the size of the lesion, and how much the lesion obstructs the tracheal diameter. Milder cases may present with coughing and dyspnea, often easily mistaken for asthma, while more severe cases can include hemoptysis and stridor due to airflow obstruction, necessitating further investigation [4]. They are also associated with pneumonia due to secretion buildup in the tracheobronchial tree [5].

Tracheal tumors are extremely rare, representing only 0.3% of all tumors [4]. Only 10 to 20% of primary tracheal tumors are benign, including glomus tumors. Most have a mesenchymal origin, with around 50% occurring in the lower third of the trachea and 25% in the middle and upper thirds. They are pedunculated, unlike malignant tumors. Squamous cell papillomas are the most common, entering the differential diagnosis alongside malignant tumors, such as squamous cell carcinoma, which is the most common tumor found in the trachea [6].

In this article, we present a case of a glomus tumor in the trachea, highlighting its symptoms, diagnostic methods, and appropriate treatment.

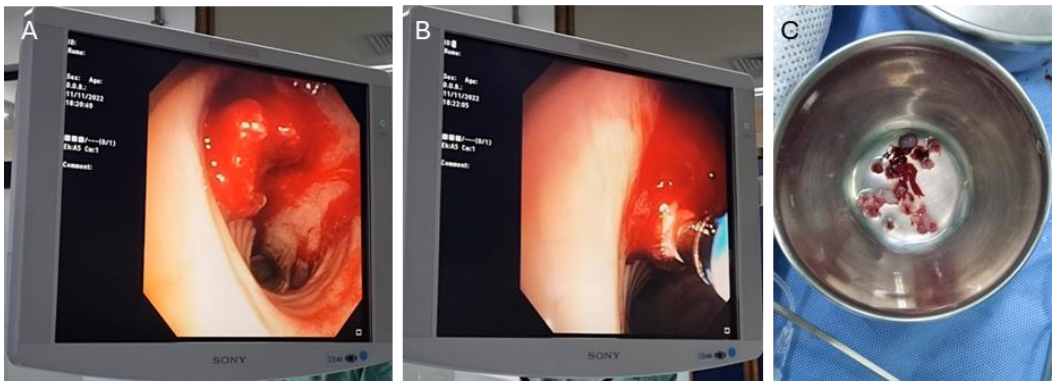
2. Case Report

Male, Caucasian, 53 years old, presented to the Emergency Room of the Hospital de Base do Distrito Federal due to moderate exertional dyspnea. During the physical examination, the patient was in regular general condition, anicteric, acyanotic, afebrile, with a normal cardiac assessment, but with mild stridor, tachypnea (respiratory rate around 22 breaths per minute, and oxygen saturation of 92%), abdomen without abnormalities, lower limbs without edema, and laboratory tests without notable findings. During the anamnesis, the patient reported having systemic arterial hypertension, treated with captopril, and gastroesophageal reflux disease, treated with daily omeprazole. He denied alcohol consumption, smoking, and previous surgeries. He also reported excessive throat clearing, with a sensation of something stuck in the trachea for approximately 3 months, which had been worsening.

A chest computed tomography (CT) scan was performed during the patient's admission to the emergency room, revealing parietal thickening of the right posterolateral wall of the upper thoracic trachea, about 5.4 cm from the carina, involving the adventitia. Additionally, a polypoid component was observed projecting into the tracheal lumen, causing a luminal reduction of approximately 50%, with a lesion extension of 1.6 cm.

Following this finding on the CT scan, bronchoscopy with cryotherapy was chosen to resect the tumor, aiming to relieve symptoms and obtain a diagnosis of the vegetative lesion observed on the tomography. An incisional biopsy was performed, with the material sent for pathological and immunohistochemical analysis of the lesion, along with a reduction in the area of luminal obstruction, which improved the patient's symptoms.

Figure 1. **A.** Presence of the endotracheal lesion. **B.** Biopsy performed by cryotherapy. **C.** Biopsy samples obtained by cryotherapy.

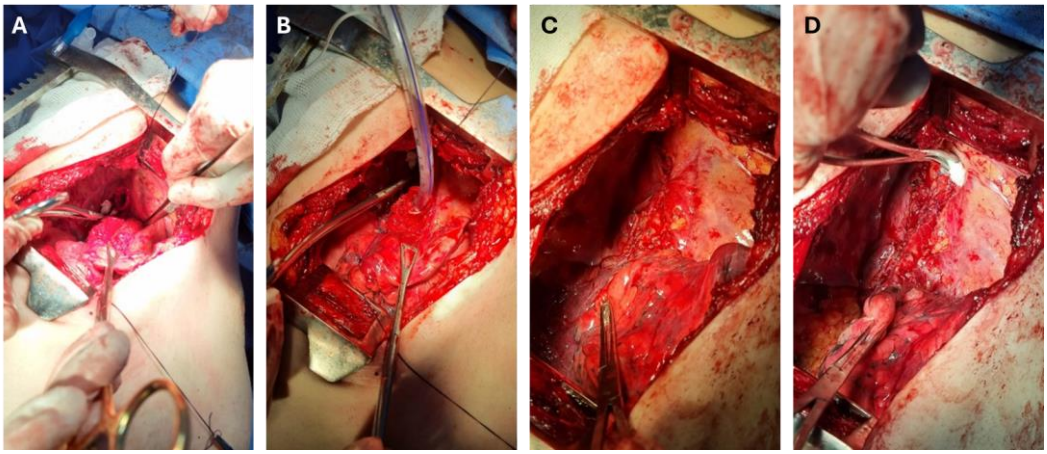


Through the images, we observe the presence of the bleeding lesion near the carina (Figure 1A). In Figure 1B, we see the cryotherapy being performed for lesion resection, and in Figure 1C, the material removed via cryotherapy, which was sent for pathological analysis and immunohistochemistry. The patient remained hospitalized for an additional day for hematimetric control and to assess the improvement of respiratory symptoms postoperatively, being discharged on the second day with a referral for follow-up in the thoracic surgery outpatient clinic. At the post-surgical outpatient consultation, immunohistochemistry confirmed that the lesion was a glomus tumor. Follow-up CT scans in the outpatient clinic revealed that, even after the procedure, the lesion continued to grow. The latest report indicated signs of partial resection of the lesion located in the right posterolateral wall of the thoracic trachea, with part of the posterior component still present, measuring approximately 1.8 x 0.8 cm.

Surgical treatment of the lesion was performed on 02/10/2023, approximately one year after the initial bronchoscopy with cryotherapy. The procedure consisted of a mediastinal tracheoplasty, with a right posterolateral thoracotomy of approximately 10 cm. The entire mediastinal pleura was opened, and the azygos vein was ligated for better tracheal

exposure. A 1.5 cm length of the trachea was resected, with disease-free margins. The tracheal suture was performed with separate 3.0 PDS stitches, and a number 30 chest tube was inserted to monitor for a possible tracheal fistula. Some steps of the surgery are recorded in Figure 2. After the procedure, the patient remained hospitalized for another 7 days, was discharged, and referred for outpatient follow-up.

Figure 2. **A.** Proximal margin of the lesion. **B.** Distal margin of the lesion with a tube used for patient ventilation. **C.** Post-mediastinal tracheoplasty. **D.** Final result of the surgery.



3. Discussion

Glomus tumors are uncommon, accounting for only 2% of soft tissue tumors. They are typically found in the fingers, hands, and feet. However, a rarer site of involvement is the airways, both upper and lower, and even the lungs [7]. Glomera are responsible for controlling body temperature at the skin's surface [8]. Glomus tumors are mesenchymal tumors, believed to be related to smooth muscle cells [7].

Regarding tracheal tumors, they are extremely rare, with an incidence rate of 0.2 per 100,000 inhabitants, making them approximately 180 times rarer than lung cancers [4]. These tumors can be distributed throughout the trachea, but are generally located in the lower third, with lesions on the posterior tracheal wall. Most are endoluminal, although extratracheal cases have been reported [3]. Their symptoms can mimic asthma, leading to misdiagnoses until the condition reaches more severe stages. The most common symptoms are cough and dyspnea (depending on the degree of tracheal lumen compromise), as well as stridor, which can be easily confused with other pulmonary pathologies, such as asthma and chronic tracheobronchitis [6].

Situations in which tracheal tumors mimic asthma include: (1) short-term improvement with oral corticosteroid treatment (due to the reduction of edema surrounding the tumor); (2) pedunculated tumors may exert a ball-valve effect, causing pulmonary hyperinflation [6]. Cough and expectoration are common due to the accumulation of endotracheal secretions caused by tumor obstruction, leading to significant air turbulence in the trachea, predisposing to hemoptysis, which occurs in about 30% of cases and may cause airway obstruction by clots, representing a life-threatening risk for the patient [6].

The main differential diagnoses, besides the previously mentioned carcinoid tumor, include paragangliomas and hemangiomas, requiring differentiation through histopathological and immunohistochemical examination of the specimen [9]. Tracheal tumors can be classified as benign or malignant, originating from epithelial cells, tracheal glands, and mesenchymal cells [4]. For diagnosing this condition, a contrast-enhanced chest CT scan is used to assess the tracheal lesion, its location, size, tissue invasion, and the presence or absence of pulmonary metastasis. Depending on the tumor's location and size, spirometry

may range from normal to a mildly restrictive pattern. After the tracheal tumor evaluation, bronchoscopy is necessary, as it is the only method capable of confirming the diagnosis reliably, allowing for lesion localization and assessing its extent [7].

In terms of treatment, surgery is the first choice, either through mediastinal tracheoplasty or endoluminal treatment. If mediastinal tracheoplasty is chosen, the affected tracheal rings can be removed, followed by primary anastomosis. Endoluminal treatment may be an option for patients who do not wish to undergo a more invasive procedure or who are at high surgical risk, provided the lesion is restricted and does not involve the tracheal wall [10]. Of the 31 cases described in the literature, most underwent surgical resection followed by reconstruction, with only nine patients receiving endoscopic resection combined with laser ablation [10].

4. Conclusion

Although rare, glomus tumors represent an important consideration in the differential diagnosis of tracheal lesions, especially in patients with persistent respiratory symptoms such as cough, dyspnea, and stridor. The presented case illustrates how careful evaluation and proper investigation are crucial for the correct diagnosis and effective management of this condition. Biopsy confirmation, along with surgical treatment, proved to be an effective approach, not only allowing for tumor removal but also significantly improving the patient's quality of life. The literature indicates that, despite being predominantly benign, early identification and treatment of glomus tumors are crucial to avoid severe complications and ensure a good prognosis. Therefore, it is essential for healthcare professionals to be aware of the manifestations and importance of an accurate diagnosis to optimize patient care.

Funding: Not applicable.

Research Ethics Committee Approval: We declare that the patient approved the study by signing the informed consent form, and that the study followed the ethical guidelines established by the Declaration of Helsinki.

Acknowledgments: Not applicable.

Conflicts of Interest: The authors declare no conflicts of interest.

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