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Case report Free Access

A rare case of bronchial glomus tumour of uncertain malignant potential

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Abstract

Introduction: Glomus tumours are typically benign pericytic mesenchymal neoplasms, occurring in the soft tissues of distal extremities, and rarely seen in deep soft tissues and visceral locations. Malignant glomus tumours are exceedingly uncommon. Here, we present a rare case of glomus tumour with uncertain malignant potential, arising in the bronchus of a young female patient. This case report highlights the clinical, radiological, and pathological aspects of this unusual entity, discussing the challenges in diagnosis and management and reviewing relevant literature on its behaviour and treatment options.

Case Presentation: A 35-year-old lady with progressive breathlessness and cough, was found to have an obstructive mass lesion in the right upper lobe bronchus on CT scan. Check bronchoscopy and biopsy revealed features of a low-grade spindle cell lesion, with the possible differentials of a Glomus tumour and low-grade myofibroblastic tumour. She underwent right upper lobectomy; the final histopathological exam with the aid of immunohistochemistry confirmed the diagnosis of a Glomus tumour of uncertain malignant potential. Post-operatively, due to localised disease with negative surgical margins, she was kept on regular follow-up and was asymptomatic 6 months post-surgery.

Discussion: The possibility of a Glomus tumour must be considered for tumours with plump spindle to round cell morphology on a bronchoscopic biopsy. Immunohistochemistry helps to exclude most differentials. The assessment of malignant potential in Glomus tumour requires thorough examination of a completely resected tumour sample. Molecular studies have shown NOTCH1 gene rearrangements in both benign and malignant Glomus tumours. However, it does not help to predict malignant potential in benign-appearing tumours.

Conclusion: Bronchial Glomus tumours of uncertain malignant potential are rare tumours requiring more research on molecular markers for prognostication and treatment. This case is presented for its rarity, diagnostic and prognostic challenges.

Keywords: Glomangiomyoma, Coin lesion, Glomus Tumour of Uncertain Malignant Potential, SMA, Glomus classification

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Introduction

Glomus tumours (GT) originate from the glomus cells of the glomus body, a neuro-myo-arterial structure involved in regulating cutaneous circulation. These tumours constitute less than 2% of soft tissue tumours (1) and usually arise in distal extremities. Rare sites of occurrence include the gastrointestinal tract, genitourinary system, mediastinum, nerves, bones, and lungs (2). When arising in the bronchopulmonary tract, a number of entities enter the differential diagnosis and the possibility of glomus tumour may not be suspected, due to its rarity. The differentials considered in this site usually include carcinoid tumour, solitary fibrous tumour, sclerosing haemangioma, leiomyoma, paraganglioma etc. Though surgery remains the primary modality of treatment for most of these tumours, the prognosis, behaviour and adjuvant treatments vary and therein lies the importance of accurate diagnosis. Glomus tumours have been conventionally classified as benign, 'of uncertain malignant potential' and malignant. The assessment of malignant potential of GT is challenging on small bronchoscopic biopsies as they may not represent the entire picture. This is especially important for malignant Glomus tumours, as they behave very aggressively. This case report discusses a rare case of a young female with an endobronchial glomangiomyoma of uncertain malignant potential. The clinical and diagnostic work-up, treatment given and relevant published literature are discussed.

Case presentation

A 35-year-old lady presented with progressively worsening intermittent cough and breathlessness on exertion over a period of 1 month. She did not have fever, loss of appetite, weight loss, or pain. Her medical history was unremarkable. A chest CT scan (Figure 1) revealed an exo-endoluminal mass lesion occluding the right main stem bronchus; the endoluminal component appeared hypodense and exoluminal component appeared hyperdense with intrabronchial extension at places. Check bronchoscopy confirmed a mass lesion in the right main bronchus causing near-complete occlusion. Tumour debulking was performed in view of obstruction, using electrocautery snare under general anaesthesia. Cryo-debulking was also performed. The tumour was noted to be arising from the right upper lobe bronchus with the rest of the right bronchial tree being normal. Argon plasma coagulation was used to control bleeding after debulking. The biopsy sample was subjected to histopathological evaluation and immunohistochemistry. At this point of time, the provisional clinical diagnosis of neuroendocrine tumour was considered.

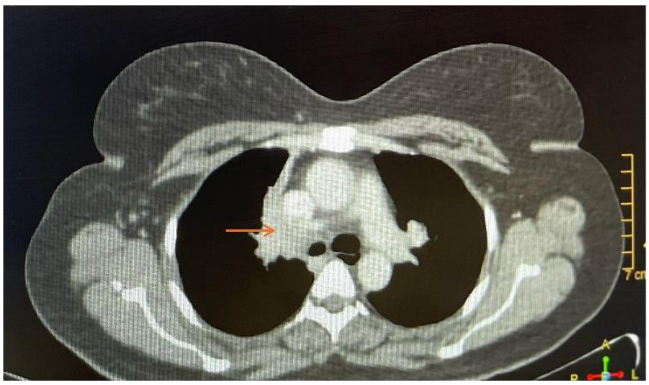

Figure 1. CT thorax showing right bronchial hypodense endoluminal mass (arrow).

Histologically, the biopsy showed a neoplasm composed of spindle to oval cells with pale eosinophilic cytoplasm and plump ovoid to spindle nuclei, arranged in sheets and fascicles. There was no significant nuclear atypia; mitotic figures were sparse (less than 1 per 2 square mm). Thin-walled branching blood vessels were present without evidence of calcifications or necrosis. Immunohistochemical staining demonstrated strong tumour positivity for Vimentin, alpha-SMA (Smooth Muscle Actin), focal S100 positivity, and a Ki67 index of ~12% at hotspots. Negative stains included PanCK (excluding a salivary neoplasm), neuroendocrine markers -Synaptophysin & Chromogranin (excluding carcinoid), STAT6 (excluding solitary fibrous tumour), Desmin (excluding leiomyoma), TLE1 (excluding synovial sarcoma) and ALK (for inflammatory myofibroblastic tumour). A brisk inflammatory activity characteristic for inflammatory myofibroblastic tumour (IMT) was not evident in the limited sampling. The differentials considered at this stage were a Glomus tumour and a low-grade myofibroblastic tumour, in view of spindled morphology, SMA positivity and relatively low Ki67 index. The final diagnosis was reserved for the resection specimen to evaluate other areas of the tumour.

A PET-CT scan confirmed localized disease with low grade FDG uptake (SUV max 3.5). In view of features suspicious for a localised neoplastic pathology of uncertain malignant potential, the patient subsequently underwent right upper lobectomy. The resected specimen (Figure 2) showed a solid, grey-white endobronchial tumour involving the largest and another branching bronchus, measuring 3.5x1.5x1.5 cm.

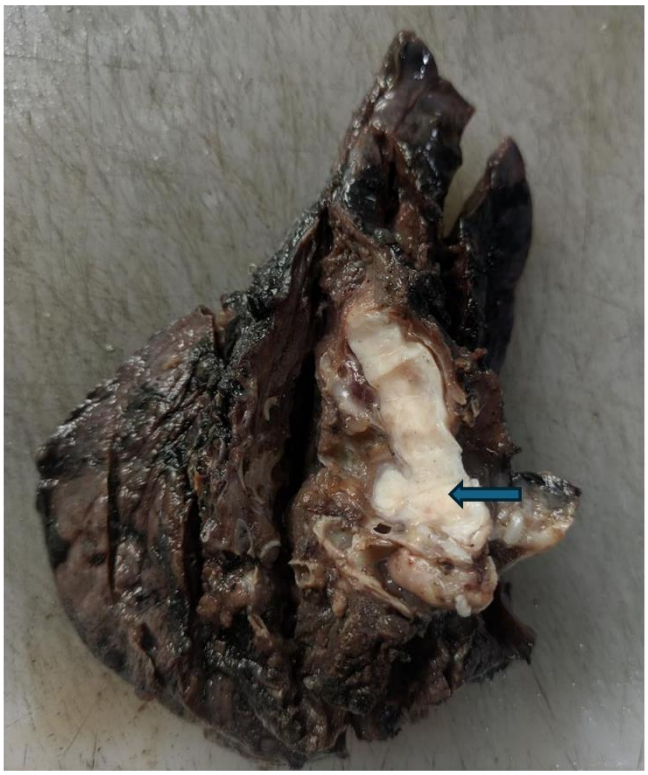

Figure 2. Lobectomy specimen with cross section of main bronchus displaying grey-white tumour filling the lumen (arrow).

The microscopic examination revealed a tumour composed of oval to spindle cells arranged in sheets with interspersed thin-walled blood vessels and separated by focal hyalinized stroma (Figure 3A). A few areas resembling smooth muscle fibres in fascicles were also observed (Figure 3B).

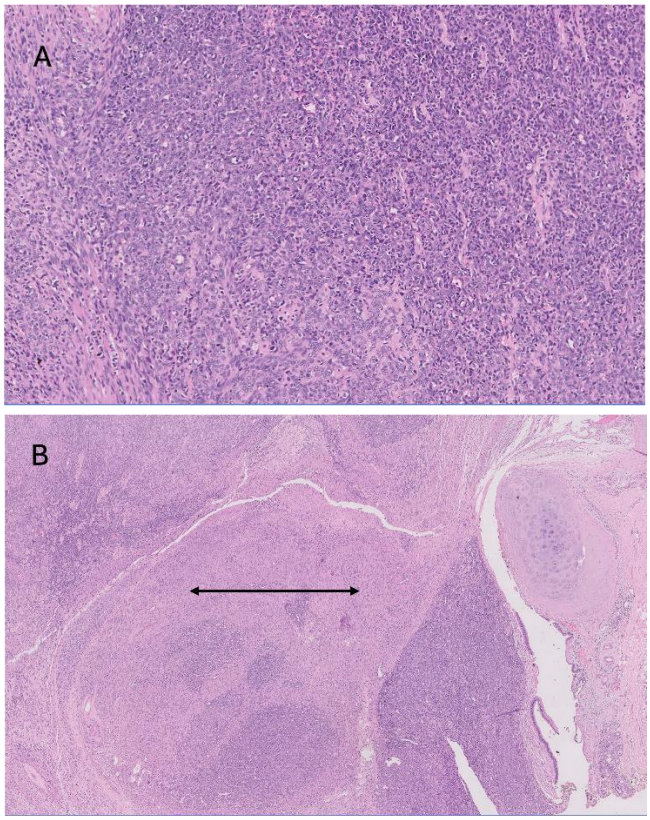

Figure 3. A. Microscopic examination shows sheets of spindled cells with scant hyalinised matrix (H&E, 100X). B. Smooth muscle component seen at places within the tumour (arrow) (H&E, 40X).

The tumour cells exhibited scant cytoplasm, elongated spindled to oval nuclei, vesicular chromatin, occasional intranuclear grooves, and inconspicuous nucleoli (Figure 4).

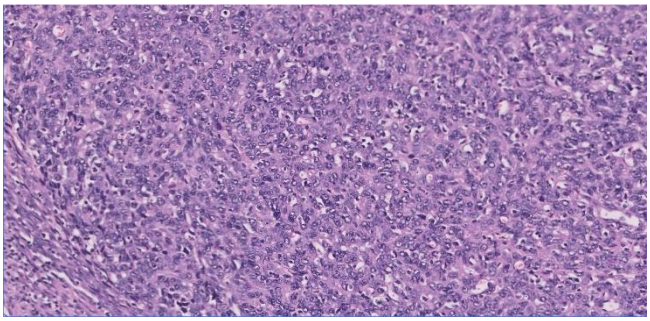

Figure 4. Microscopic examination-high power magnification shows spindled tumour cells with plump spindle to oval nuclei, vesicular chromatin, and inconspicuous nucleoli. (H&E, 400X).

Some areas showed moderate nuclear atypia. The mitotic rate was 3 per 2 sq. mm. Lymphovascular and perineural invasion were not identified. Seven perihilar lymph nodes showed reactive hyperplasia.

Immunohistochemical analysis of the resected tumour showed similar findings as seen in the bronchoscopic biopsy, including strong positivity for vimentin and SMA (Figure 5). h-Caldesmon was positive only in the myomatous component and negative in other areas. There was no inflammatory component to suggest inflammatory myofibroblastic tumour (IMT).

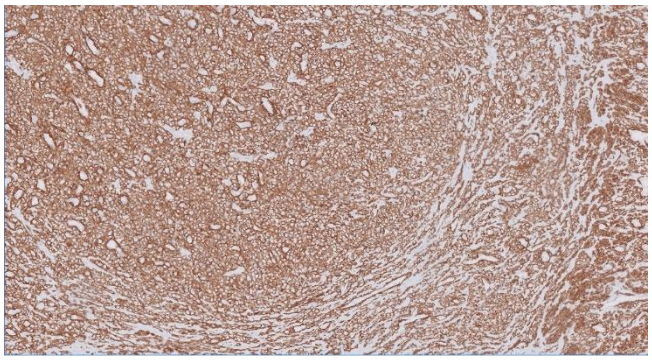

Figure 5. Diffuse strong cytoplasmic staining for smooth muscle actin (SMA) seen in tumour cells by IHC.

The characteristic perivascular concentric arrangement of tumour cells seen in myopericytoma and biphasic zonation phenomenon (central spindle cells with hemangiopericytomatous pattern and peripheral hyalinised area) of a myofibroma were not seen; both conditions are generally seen in dermis and subcutis and very rarely in deep locations. The complete histological and immunohistochemical evaluation of the tumour showed morphology consistent with a Glomangiomyoma. Invasion into the bronchial wall and peribronchial fibrous tissue was observed focally (Figure 6). There was no evidence of marked nuclear atypia or atypical mitosis to indicate malignancy. Applying WHO classification of Glomus tumours (2), due to focal moderate nuclear atypia, infiltration of the bronchial wall, deep location, and size exceeding 2 cm, the diagnosis of Glomus tumour (Glomangiomyoma) of uncertain malignant potential (GTUMP) was made. In view of negative surgical margins and absence of metastatic disease, the patient was placed on close follow-up and remained asymptomatic at 6 months post-surgery.

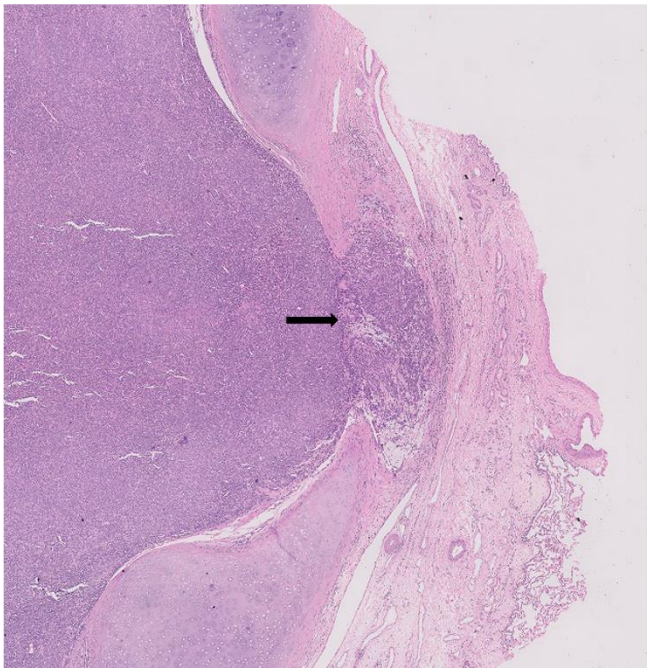

Figure 6. Tumour infiltrates bronchial wall microscopically (arrow).

Discussion

The term "glomus" originates from Latin, meaning "ball" or spherical mass. Oide et al. analysed reported cases of bronchopulmonary Glomus tumours, identifying 36 cases arising from either the bronchus or lung; this series showed that the tumour occurred predominantly in adult males (3). A PubMed search for "Glomus tumour of uncertain malignant potential" and "bronchopulmonary Glomus tumours" yielded two additional case reports (4), (5) and a series of 11 cases (6) from 2010 to 2019.

Radiologically, GT present as variable-sized lesions on chest radiographs. Cunningham JD et al (7) reviewed imaging findings in 21 cases, noting that both benign and malignant tumours appear as well-circumscribed solid masses without internal calcification or cavitation. On CT, tumours exhibit peripheral vascularity with heterogeneous peripheral contrast enhancement and a lack of central enhancement in both benign and malignant lesions. PET-CT is of limited use in differentiating benign from malignant primary lesions, as both may show absent or low-to-moderate FDG uptake.

One of the primary challenges in evaluating Glomus tumours is assessing their malignant potential. The recent WHO classification (2) categorizes Glomus

tumours into benign, GTUMP, and malignant based on atypical features: Benign tumours show classic histology and lack atypical features; malignant tumours show marked nuclear atypia or atypical mitosis; GTUMP do not fulfil the criteria for malignancy but have at least 1 atypical feature other than nuclear pleomorphism. This classification of GTUMP has evolved from earlier criteria by Folpe et al (9)., with emphasis on nuclear pleomorphism and other atypical features which include: infiltrative growth pattern, high cellularity, necrosis, spindled morphology, large size (>2cm), and deep location. However, cases lacking nuclear pleomorphism despite atypical features pose challenges in exact categorization using WHO criteria. This case, with focal moderate atypia but large size, deep location, and bronchial wall infiltration, was categorized as GTUMP. Glomus tumours are consistently positive for SMA; additional positive stains include vimentin, h-Caldesmon and stromal collagen-IV. CD34 positivity has been reported in up to 32% of cases (8). In these cases, a negative STAT6 can exclude a solitary fibrous tumour.

Complete surgical excision with negative margins has been recommended (9,10) for all cases. Chemotherapy has been employed in rare cases of metastatic disease, following protocols similar to sarcomas (11). Molecular studies of glomus tumours arising in various sites have shown the occurrence of NOTCH gene fusions in more than half the cases (predominantly in benign GT), less commonly, BRAF V600E and very rarely KRAS G12A mutations (12,13). Most benign NOTCH-fusion positive GT occurred in extremities while the malignant NOTCH positive tumours occurred in viscera (gastrointestinal tract and lung). The identification of NOTCH gene rearrangement by FISH can help in diagnosing a malignant glomus tumour in diagnostically challenging cases (12). However, to the best of our knowledge, molecular markers that predict malignant behaviour in GT have not been established so far; such a marker could aid in cases of partially resected tumours and tumours with uncertain malignant potential for deciding further treatment and follow-up. Next generation sequencing of these tumours may facilitate identification of further molecular alterations and thereby, potential targets for therapy.

Conclusion

Primary pulmonary Glomus tumors are rare lesions in the bronchi or lungs, often mistaken for more common entities at these sites and challenging to differentiate radiologically. Glomus tumours can exhibit atypical or malignant features, necessitating comprehensive evaluation of all specimens. Ambiguities persist in exact categorization of Glomus tumours with uncertain malignant potential. While complete surgical excision remains the preferred treatment, alternative options such as chemotherapy and targeted therapy need to be explored. The identification of molecular markers to predict malignancy and potential targets for treatment warrant further studies.

Etical approved

Written informed consent for publication was obtained from the patient.

Author contribution

Conceptualization: **ShS, ShV, AK**. Data curation: **ShS, ShV, AK, SK**. Formal analysis: **ShS, ShV, AK**. Investigation: **SV, DV, AK**. Methodology: **ShV, AK**. Administration**: ShV, AK**. Resources: **ShV**. Software: **ShV**. Supervision: **ShV, AK**. Validation: **ShV, AK**. Visualization: **ShV**, **AK**. Writing—original draft: **ShS, ShV**. Writing— review & editing: **ShV, AK**. Approval of final manuscript: all authors..

Conflict of interest

There is no Conflicts of interest/competing interests.

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References

1. Gombos Z, Zhang PJ. Glomus tumor. Arch Pathol Lab Med. 2008 Sep;132(9):1448-52.

2. Specht K, Antonescu CR. Glomus tumour. In: WHO classification of tumours (5th edition) of soft tissue and bone. Lyon: International Agency for Research on Cancer (IARC). 2020:179–181.

3. Oide T, Yasufuku K, Shibuya K, Yoshino I, Nakatani Y, Hiroshima K. Primary pulmonary glomus tumor of uncertain malignant potential: A case report with literature review focusing on current concepts of malignancy grade estimation. Respir Med Case Rep. 2016;19:143-9.

4. Jin Y, Al Sawalhi S, Zhao D et al. Behavior of primary tracheal glomus tumor, uncertain malignant potential subtype. Gen Thorac Cardiovasc Surg. 2019 Nov;67(11):991-5.

5. Dai SH, Tseng HY, Wu PS. A glomus tumor of the lung of uncertain malignant potential: A case report. Int J Clin Exp Pathol. 2018 Dec;11(12):6039-41. Erratum in: Int J Clin Exp Pathol. 2019 Mar;12(3):1117.

6. Zhao SN, Jin Y, Xie HK, Wu CY, Li Y, Zhang LP. Clinicopathological characterization of primary pulmonary and tracheal glomus tumors. Zhonghua Bing Li Xue Za Zhi. 2020 Dec 8;49(12):1282-7.

7. Cunningham JD, Plodkowski AJ, Giri DD, Hwang S. Case report of malignant pulmonary parenchymal glomus tumor: Imaging features and review of the literature. Clin Imaging. 2016 Jan;40(1):144-7.

8. Mravic M, LaChaud G, Nguyen A, Scott MA, Dry SM, James AW. Clinical and histopathological diagnosis of glomus tumor: An institutional experience of 138 cases. Int J Surg Pathol. 2015;23(3):181-8.

9. Folpe AL, Fanburg-Smith JC, Miettinen M, Weiss SW. Atypical and malignant glomus tumors: Analysis of 52 cases, with a proposal for the reclassification of glomus tumors. Am J Surg Pathol. 2001 Jan;25(1):1-2.

10. Wood C, et al. Malignant glomus tumors: Clinical features and outcomes. Clin Sarcoma Res. 2020;10:20.

11. Wolter NE, Adil E, Irace AL, et al. Malignant glomus tumors of the head and neck in children and adults: Evaluation and management. Laryngoscope. 2017 Dec;127(12):2873-82.

12. Agaram NP, Zhang L, Jungbluth AA, Dickson BC, Antonescu CR. A molecular reappraisal of glomus tumors and related pericytic neoplasms with emphasis on NOTCH-gene fusions. Am J Surg Pathol. 2020 Nov;44(11):1556-62.

13. Chakrapani A, Warrick A, Nelson D, et al. BRAF and KRAS mutations in sporadic glomus tumors. Am J Dermatopathol. 2012;34: 533–535.