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Case report

Granular cell tumor of the bronchus: A case report

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ABSTRACT

Introduction and importance: Pulmonary granular cell tumor (GCT) is a very rare neoplasm that originates from Schwann cells.
Case presentation: Our case report describes a symptomatic benign pulmonary GCT found during follow-up CT imaging and was eventually excised with a good outcome.
Clinical discussion: GCT are mostly benign tumors. Pulmonary GCTs mostly occur in the endobronchial region and can be symptomatic or discovered incidentally.
Conclusion: Treatment options for pulmonary GCT are either conservative treatment or surgical resection depending on the size of the tumor and the presence of tracheal wall invasion.

1. Introduction

Pulmonary granular cell tumors (GCT) are a very rare neoplasm that originates from Schwann cells [1,2]. They accounts for approximately 2–6% of all GCT, and 90% of these originate from the endobronchial area [1]. GCT is mostly a benign neoplasm, but around 1–2% are malignant tumors [2]. It has a wide variety of symptoms based on the size and location of the tumor [1]. Treatment can be conservative or surgical depending on the tumor size and the invasion of adjacent structures [1,3]. We report here a case of granular cell tumors (GCT) found in the bronchi of the lung that was surgically excised. This work has been reported in line with the SCARE criteria 2020 [4].

2. Case presentation

A 51-year-old male had hypertension and gastric cancer diagnosed eight years ago and treated with partial gastrectomy and chemotherapy. During his regular follow up, he presented with shortness of breath, cough, and hemoptysis. Lab results were normal except for low hemoglobin. Computed tomography (CT) of the chest showed a lobulated lesion at the right upper lobe bronchus measuring 18 × 13 mm with some extension into the adjacent parenchyma (Fig. 1). The lesion was gradually progressing in size according to previous chest CT. The thoracic surgery team was consulted. A bronchoscopy was done confirming the CT findings, and a biopsy from the lesion was taken for histopathology. Histopathology results showed a granular cell tumor with immunohistochemistry positive for S-100 (Fig. 2). The patient underwent right upper lobectomy including the endobronchial lesion. The operation was successful with no complications. Post-operatively, the patient was followed by daily physical examination and chest X-rays. He was vitally stable with good pain control. Both lungs on x-rays were fully expanded. He was discharged a few days later and followed in the clinic. The endobronchial lesion biopsy report came back describing a complete resection of the bronchial wall mass lesion measuring 2*1.5*1 cm with an extension to the bronchial margins. The diagnosis was confirmed to be a benign granular cell tumor positive for S-100, INHIBIN, and NSE.

3. Discussion

Pulmonary GCT is a rare neoplasm accounting for 2–6% of all GCT with less than 80 cases reported in the literature [1,3]. It commonly presents between the fourth to sixth decade with no gender difference [1,2]. 90% of pulmonary GCT are seen in the endobronchial region with a tendency to appear at the bronchial bifurcation sites [1].

GCT was believed to originate from myogenic cells, but most studies suggest that it originates from Schwann cells [2,5]. The granular appearance of the cytoplasm is the distinctive feature of GCT [1]. S-100 protein, vimentin, neuron-specific enolase (NSE), NK1-C3, and CD68 are usually positive in most GCTs [1]. In our case, the histological appearance along the immunohistochemistry positive for S100 and NSE suggest that the extracted lesion is a granular cell tumor originating from

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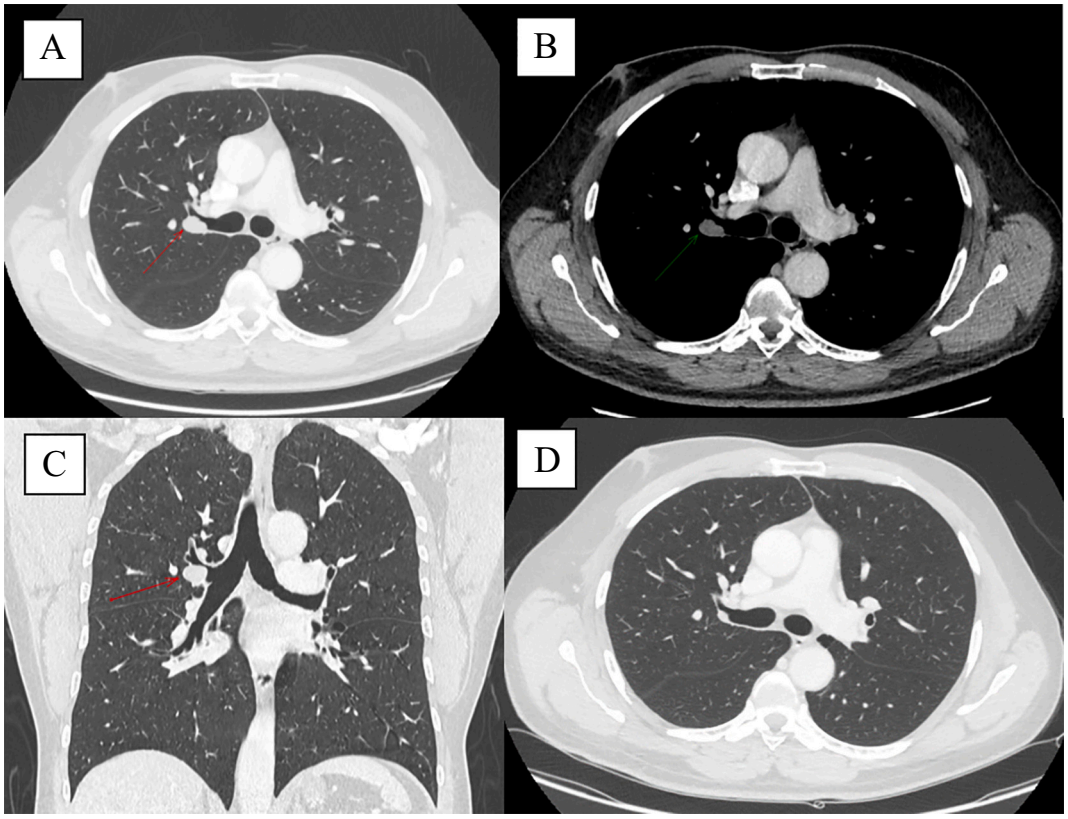

Fig. 1. CT chest showing right upper lobe bronchus lobulated lesion with some extension into the adjacent parenchyma. (A, B, C) There is an interval and gradual progression in size versus a previous study (D).

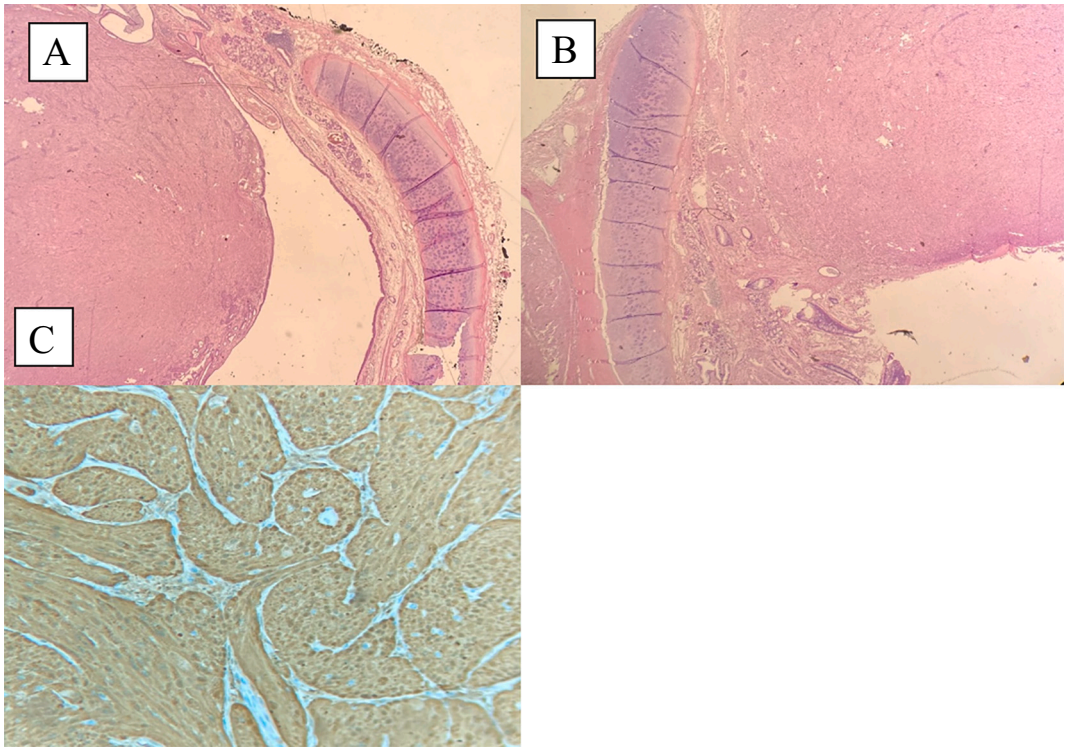

Fig. 2. Histopathology slides (A, B) show the entire endobronchial mass attached to the bronchial wall. Panel (C) shows a section from the cell block that is positive for S100.

Schwann cells.

Pulmonary GCT has a wide range of symptoms and signs depending on the size of the tumor and its location [1]. Tumors centrally located are usually symptomatic, but some patients may have an incidental finding with radiological studies alone [1,5,6]. Patients may present with dysphagia, chest pain, cough, dyspnea, hemoptysis, and stridor [1]. The chest x-ray may show normal findings or it can show signs of pneumonia, atelectasis, mucoid impaction, and bronchiectasis as well as apparent tumor [1]. CT usually shows a soft tissue mass located in the endobronchial region [1]. GCTs are grossly described as rounded firm mucosal covered masses with a size range of 0.3 to 5 cm [1]. However, the definite diagnosis of pulmonary GCT is established by pathology [1].

GCT are mostly benign tumors while malignant GCT tumors are rare (accounting for only 1–2%) [2,3]. Upon attempting to distinguish the benign nature of GCT from malignant disease, three out of six histological features must be considered to diagnose a malignant tumor [3,7]: spindling of tumor cells, the presence of vesicular nuclei with large nucleoli, a high mitotic rate of more than two mitotic cells/10 high power fields at more than 200× magnification, high nucleus-to-cytoplasm ratio, pleomorphism, and necrosis [3,7]. Recent studies found that the up regulation of p53 and ki67 tumor markers supports the diagnosis of a malignant tumor [3]. Some studies report that a tumor size of more than 5 cm suggests a malignant nature while other studies confirm that the tumor size in not a reliable factor in determining the nature of the tumor [2,3]. In our case, the previous histological criteria were not met, and thus a benign GCT diagnosis was established.

Treatment options for GCT are either conservative treatment or surgical resection depending on the size of the tumor and the presence of tracheal wall invasion [1,3,5]. Small GCTs of less than 1 cm are preferably treated by bronchoscopic excision, laser therapy, or sleeve resection [3,6]. Large GCT tumors of more than 1 cm are treated by complete surgical resection [3]. Brochoscopically excised granular tumor cells more than 1 cm were reported to have a high recurrence rate that could be explained by the fact that large tumors usually involve the tracheal wall full thickness; therefore, a surgical approach is preferred in such cases [8]. Surgical resection is curative, but tumor recurrence has been reported. For that, a follow up once a year for a minimum of 5 years is recommended [1]. The progressive nature of the lesion with invasion to adjacent structures favors surgical resection in our case.

4. Conclusion

GCT is an extremely rare tumor with few cases reported in literature. The management of such tumors depends on the local characteristics of the tumor. Our case report describes a symptomatic benign pulmonary GCT found during follow up CT imaging that was eventually excised with a good outcome.

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Ethical approval

N/A.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Research registration

N/A.

Guarantor

Dr. Mohammed Ishaq and Dr. Esraa Arabi accept full responsibility for the work, had access to the data, and controlled the decision to publish

CRediT authorship contribution statement

Dr. Mohammed Ishaq: data collection, interpretation, writing the paper.

Dr. Esraa Arabi: writing and editing the paper, process of publishing.

Dr. Ayman Yousef: writing and editing the paper.

Dr. Haifa Almedbal: writing and editing the paper.

Declaration of competing interest

No conflict of interest.

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