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## Bronchial carcinoid tumor: A case report

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## ABSTRACT

**INTRODUCTION:** Bronchial carcinoid tumors are rare, slow growing, malignant neuroendocrine tumors and account for less than 2% of all lung tumors. Early diagnosis is extremely important as the main stay of treatment is surgical excision.

**PRESENTATION OF CASE:** We present a rare case of bronchial typical carcinoid tumor in a 22-year-old female who presented with a complaint of intermittent productive cough with bloody sputum of 3 weeks' duration associated with wheezing, low grade intermittent fever and loss of appetite. She was being treated as bronchial asthma for 10 years prior to her current presentation. Right lung bi-lobectomy with regional lymph node resection was done and she was discharged home in good condition.

**DISCUSSION:** Majority of typical carcinoids are located in the central airways leading to bronchial obstruction with recurrent pneumonia, chest pain, wheezing and hemoptysis. Due to such nonspecific presentation most patients are misdiagnosed or diagnosed late. Both typical and atypical Carcinoids have similar radiologic features and definitive diagnosis relies on bronchoscopic tissue biopsy. Although hilar and mediastinal lymph nodes are the most common metastatic sites for typical carcinoids most lymphadenopathies are caused by a reactive inflammatory reaction.

**CONCLUSION:** Bronchial carcinoids are rare, malignant neuroendocrine tumors with complete surgical resection being the only curative management. Thus patients with recurrent respiratory symptoms despite optimum medical treatment should be thoroughly investigated for accurate and early diagnosis. The outcome of typical carcinoids with lymph node metastasis is excellent with complete resection but close follow up is mandatory when dealing with larger tumors.

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## 1. Introduction

Bronchopulmonary carcinoid tumors are rare, slow growing, malignant neuroendocrine tumors arising from Enterochromaffin cells lining the aero digestive tract and account for less than 2% of lung tumors [1]. The most common site for carcinoid tumors is the gastrointestinal tract and only 10% occur in the bronchopulmonary area of which 80–90% arise within the segmental or sub segmental bronchus [2]. The scientific knowledge about bronchial carcinoid tumors has increased more slowly than gastrointestinal carcinoids and expert recommendations for diagnosis and management are also limited [3].

Patient presentation ranges from being asymptomatic in 25–39% of patients to symptoms of bronchial obstruction and

superinfection. Rarely, patients may present with features of carcinoid syndrome and crisis [4].

Early diagnosis is extremely important as the main stay of treatment is surgical excision and also determines the prognosis [2]. Diagnosis relies on Contrast enhanced chest CT scan to show hilar or perihilar masses, endobronchial nodules, enlarged mediastinal lymph nodes, findings suggestive of bronchial obstruction and peripheral nodules [5]. Fiber optic Bronchoscopy is the best method of choice for tissue diagnosis [2].

Surgery is the only curative approach in the management of pulmonary carcinoid tumors [2]. *The case report has been reported in line with the SCARE 2018 criteria* [6].

## 2. Case presentation

Twenty-two years old female presented with a complaint of intermittent productive cough with bloody sputum of 3 weeks' duration associated with wheezing, low grade intermittent fever and loss of appetite. She had frequent similar complaints for the last 10 years for which she visited different hospitals and was given salbutamol puff and antibiotics for the diagnosis of bronchial asthma with acute exacerbation. She had no contact

**Abbreviations:** CT, computerized tomography; IASCLC, International Association for the Study of Lung Cancer; SPHMMC, St. Paul's Hospital Millennium Medical College; WHO, World Health Organization.

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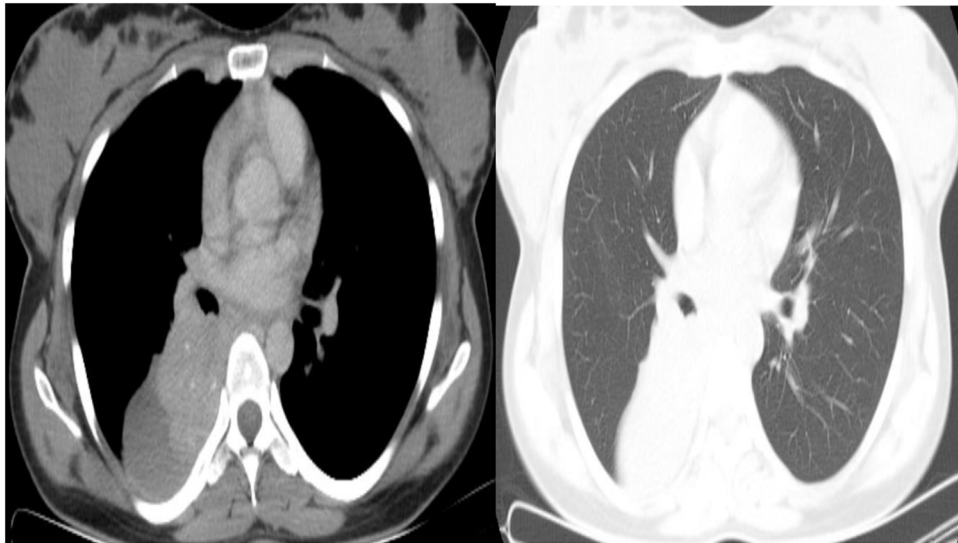


Fig. 1. Chest CT scan showing enhancing, lobulated right lung lower lobe soft tissue mass encasing bronchus intermedius.

history with known pulmonary tuberculosis patients and have never smoked cigarettes. she has no history of drug allergy, self or family history of relevant medical or surgical illness. On presentation her vital signs were in the normal range. She had scattered wheeze over her right posterior lower third lung field. Otherwise, there was no remarkable finding on other systems evaluation.

Her complete blood count, renal function test and serum electrolytes were in the normal range. Chest computerized tomography (Chest CT) showed 5.6 cm × 4.4 cm enhancing, lobulated, soft tissue mass in the lower lobe of the right lung. The mass has endoluminal extension to bronchus intermedius and the lower lobe of the right lung has marked collapse due to bronchial obstruction (Fig. 1). Bronchoscopic evaluation revealed red, fleshy and fragile right bronchus intermedius mass, and tissue biopsy from the mass showed organoid growth pattern of monomorphic small cells with paper chromatin, inconspicuous nucleoli surrounded by delicate vessels with diagnostic impression of typical carcinoid tumor. Abdominal ultrasound examination didn't reveal evidence of liver secondary.

With an impression of right lung lower lobe typical carcinoid tumor, the patient was operated through right posterolateral thoracotomy after getting informed written consent. The intraoperative finding was an 8 cm × 6 cm firm lower lobe mass involving bronchus intermedius (Figs. 2 and 3). There were multiple enlarged mediastinal lymph nodes involving stations 8, 9 and 11. With these findings right lung bi-lobectomy (middle and lower lobe) with mediastinal lymphadenectomy of station 8, 9 and 11 was done and we left right tube thoracostomy.

Post procedure, she was transferred to intensive care unit and put on oxygen support as well as epidural analgesics. Subsequently, she had smooth recovery and was transferred to surgical ward. The chest tube output was insignificant and minor bubbling decreased gradually. Control chest x ray taken on her 5th post op day showed well expanded right upper lobe with no evidence of pneumothorax for which the chest tube was removed.

Histopathologic study of the excised mass showed lobulated tissue consisting of organoid and trabecular growth pattern with scattered pseudoglandular pattern. The cells are uniform round with salt and paper chromatin pattern. There was no evidence of mitosis and necrosis the final diagnosis being typical bronchopulmonary carcinoid tumor (Figs. 4 and 5). The mediastinal lymph nodes were free of metastatic deposits.

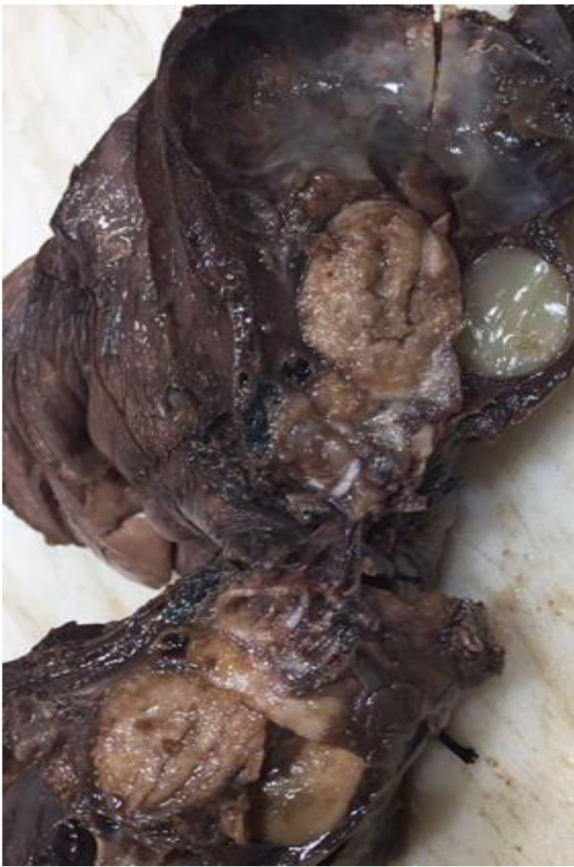


Fig. 2. Intra operative picture showing obstructive endobronchial mass.

Subsequently, the patient showed a remarkable improvement and was discharged from the hospital in a stable condition.

### 3. Discussion

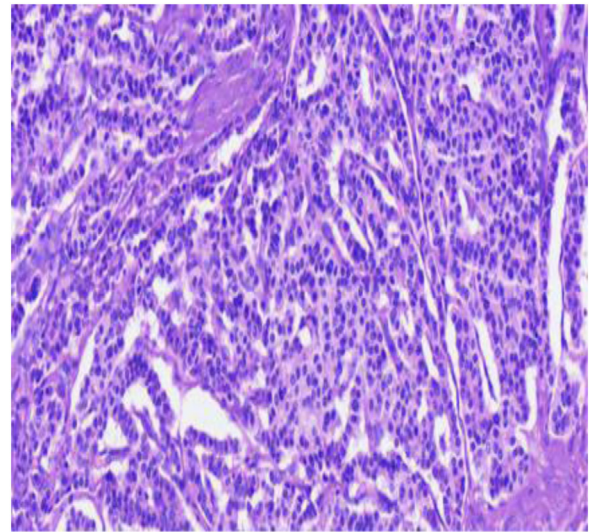
Based on histologic differentiation the World Health Organization/The International Association for the Study of Lung Cancer (WHO/IASLC) classifies pulmonary Carcinoid tumors into: Typical carcinoids (76–90%), less than 2 mitosis/2 mm<sup>2</sup> and no necrosis; Atypical carcinoid, increased mitosis (2–10 mitosis/2 mm<sup>2</sup>) with confirmed necrosis [7,8]. Typical carcinoids affect both sex with peak incidence during adolescence and age from 40 to 50 years [2]. In this regard, although our patient is adolescent, based on her presentation it looks she had the tumor since childhood with



**Fig. 3.** Post-operative tissue cut section showing lobulated, firm mass filling the bronchial lumen.



**Fig. 4.** Tissue section showing endobronchial growth of the mass involving the bronchial wall.



**Fig. 5.** Histologic section showing uniform round cells with salt and paper chromatin, and eosinophilic cytoplasm.

indolent behavior. Majority of typical carcinoids are located in the central airways leading to bronchial obstruction with recurrent pneumonia, chest pain, wheezing and hemoptysis [5]. Since it is rare tumor often it is not considered as differential diagnosis in young patients like our case presenting with such complaint. As a result, most intrabronchial carcinoid tumors are misdiagnosed or diagnosed late like our patient. Thus patients with recurrent respiratory symptoms despite optimum medical treatment should be thoroughly investigated with chest CT scan and bronchoscopy followed by tissue biopsy for accurate and early diagnosis.

Pulmonary carcinoids may release corticotropin, growth hormone releasing hormone and vasoactive substances resulting in Cushing's syndrome, acromegaly and carcinoid syndrome respectively, and none of these were evident in our patient [2]. Bronchial typical and atypical Carcinoids have similar radiologic features on chest CT scan making bronchoscopic tissue biopsy crucial to differentiate one from another [2]. Carcinoid tumors are characteristically highly vascular but the incidence of serious bleeding during bronchoscopic biopsy is very low (<1%) which makes bronchoscopy safe and gold standard modality for earlier tissue diagnosis [9].

Surgery is the only curative approach for patients with carcinoid tumors and lung saving surgeries are preferable especially for those tumors located peripherally [10]. Outcome of surgery is excellent even for patients with local nodal metastasis that does not preclude definitive surgical treatment [11]. We also did right lung bilobectomy with regional lymph node resection for our patient. Although hilar and mediastinal lymph nodes are the most common metastatic sites for typical carcinoid, most lymphadenopathies are caused by a reactive inflammatory reaction [2]. This could explain why histopathologic study of the resected lymph nodes in our patient were negative for metastasis.

Depending upon the degree of differentiation and lymph node metastasis typical Carcinoids have excellent prognosis than atypical carcinoids, with a 10-year survival rate of more than 80% [2]. Metastasis commonly occurs to mediastinal lymph nodes followed by liver [2].

Carcinoid tumors have poor response for adjuvant chemo and radiotherapy making complete resection of the tumor with regional lymph nodes the main stay of treatment. Our patient was not initiated in any form of adjuvant treatment and we are following her with clinical evaluation, radiologic imaging with chest CT scan and bronchoscopy as the chance of recurrence is higher for patients with larger tumor size in the absence of metastasis. She has no

evidence of recurrence or metastasis and is also happy with her treatment.

#### 4. Conclusion

Although bronchial carcinoid tumors are rare they should be considered as differential diagnosis in patients with recurrent respiratory symptoms despite adequate medical treatment as timely and prompt diagnosis is crucial for early intervention. Surgical resection is the main stay of treatment for patients with no evidence of systemic metastasis. The outcome of typical carcinoid tumors with lymph node metastasis is excellent with complete resection but patients with larger tumor require cautious follow up post operatively as the chance of recurrence is relatively higher.

#### Declaration of Competing Interest

The authors report no declarations of interest.

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#### Ethical approval

Ethical Clearance was obtained from the Institutional Research and Ethics Review Committee (IRB) of SPHMMC for the publication of the case report and accompanying images.

#### 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.

#### Author contribution

**Esubalew Taddese Mindaye:** Conceived and conducted the study, did literature search and Critical revision of the manuscript, primarily involved in the management of the case.

**Goytom knfe tesfaye:** Conducted over all supervision and critical revision of the manuscript.

#### Registration of research studies

NA.

#### Guarantor

Esubalew Taddese Mindaye.

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