Bronchial Carcinoid Tumor in the Era of Covid-19 Pandemic: A Case Report

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Case report

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Abstract

Introduction: Bronchial carcinoid tumors are rare, slow growing, malignant neuroendocrine tumors which arise from Enterochromaffin (Kulchitsky) cells. 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 27-year-old male who presented with a complaint of intermittent dry cough of 2 weeks' duration associated with shortness of breath, low grade intermittent fever and loss of appetite. He was initially misdiagnosed as covid-19 pneumonia and was admitted to covid-19 treatment center. Right lung bi-lobectomy with regional lymph node resection was done and he 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. In the era of covid-19 pandemic, in addition to the wide spread anxiety on the health care workers access to diagnostic work up of patients with rare diseases like bronchial carcinoids is very challenging especially in resource limited areas as invasive diagnostic procedures like bronchoscopy are usually avoided in covid-19 suspected patients during the pandemic. 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. Although the world is over burdened by Covid-19 pandemic crisis, other lung pathologies are also still present in communities. In such challenging circumstance diagnosing rare pulmonary diseases like bronchial carcinoids need high index of suspicion and meticulous diagnostic work up. 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.

Introduction

Bronchial carcinoid tumors are rare, slow growing, malignant neuroendocrine tumors which arise from Enterochromaffin (Kulchitsky) cells of the respiratory tract epithelial lining(1).They account for less than 2 % of all lung tumors (2) and predominantly arise within the lobar or segmental bronchus (3).Although no known carcinogen has been found, majority of patients diagnosed with carcinoid tumors are smokers (3).

Majority of carcinoid tumors have indolent behavior being asymptomatic in 25–39% of patients. Centrally located tumors may present with symptoms of bronchial obstruction and superinfection. Features of carcinoid syndrome and crisis occur rarely in 1% of patients (4).

Early diagnosis is extremely important as the main stay of treatment is surgical excision and also determines the prognosis (3).For centrally located tumors Contrast enhanced chest CT scan may show

characteristic 'gloved finger opacity' (5). Fiber optic bronchoscopic biopsy with immunohistochemistry test for neuroendocrine markers is the best method for definitive diagnosis(3).

Surgical resection is the treatment of choice for patients with bronchial carcinoids with no evidence of systemic metastases(3). *The case report has been reported in line with the SCARE 2018 criteria (6).*

Case Presentation

Twenty-seven years old male, postgraduate student presented with a complaint of intermittent dry cough of 2 weeks' duration associated with shortness of breath, low grade intermittent fever, night sweat and loss of appetite. He has no previous history of similar complaints. He had no contact history with known pulmonary tuberculosis patients and have never smoked cigarettes. For his complaints he visited local hospital where he was diagnosed to have Corona virus infection (covid-19 pneumonia) and was admitted to treatment center but after admission repeated covid 19 tests were repeatedly negative despite his persistent symptoms for which he was referred to our tertiary care center, Saint Paul's Hospital Millennium Medical College(SPHMMC). On presentation his vital signs were in the normal range. He had decreased air entry over his right posterior lower third lung field. Otherwise, there was no remarkable finding on other systems evaluation.

His complete blood count, renal function test and serum electrolytes were in the normal range. His RT PCR (Reverse Transcription Polymerase Chain Reaction) test for covid-19 at our hospital was negative. Chest computerized tomography (Chest CT) showed 5cm x 4 cm enhancing, lobulated, soft tissue mass in the middle lobe of the right lung. The mass has endoluminal extension to bronchus intermedius (fig.1). Bronchoscopic evaluation revealed red, fleshy and fragile right bronchus intermedius mass(fig.2), and tissue biopsy from the mass showed scattered discohesive atypical cells with eosinophilic cytoplasm and irregular nuclear border suggestive of infiltrates of carcinoma. Abdominal ultrasound examination didn't reveal evidence of liver secondary.

With an impression of right lung middle lobe mass, the patient was operated through right posterolateral thoracotomy after getting informed written consent. The intraoperative finding was an 8cm x 6 cm firm mass involving entire middle lobe and infiltrating long segment of bronchus intermedius (fig. 3). There were multiple enlarged mediastinal lymph nodes involving stations 7, 8, 9 and 11. With these findings right lung bi-lobectomy (middle and lower lobe) with mediastinal lymphadenectomy of station 7, 8, 9 and 11 was done and we left right tube thoracostomy.

Post procedure, he was transferred to intensive care unit and put on oxygen support as well as epidural analgesics. Subsequently, he 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 his 4th post op day showed well expanded right upper lobe for which the chest tube was removed.

Histopathologic study of the excised mass showed organized nests of uniform round cells with salt and pepper chromatin pattern and indistinct cytoplasm. There was no evidence of mitosis and necrosis the

final diagnosis being typical bronchopulmonary carcinoid tumor (fig.4). The mediastinal lymph nodes were free of metastatic deposits.

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

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^2 and no necrosis; Atypical carcinoid, increased mitosis(2-10 mitosis/ 2 mm^2) with confirmed necrosis (7,8). In the era of covid-19 pandemic due to the wide spread anxiety in the health care workers most clients with respiratory symptoms have higher chance to be misdiagnosed as covid-19 patients unless the RT PCR test is done cautiously. Additionally, further diagnostic work up of patients with rare diseases like bronchial carcinoids is very challenging especially in resource limited area like ours as invasive diagnostic procedures like bronchoscopy are usually avoided in covid-19 suspected patients during the pandemic. Although the sensitivity and specificity of RT PCR for covid-19 is >95%, false positivity rate is as high as 4% even in the best set ups like United kingdom mainly due to contamination and cross reaction (9). Our patient's first test result looks to be false positive and we also faced serious difficulty to access bronchoscopy service.

Majority of typical carcinoids are located in the central airways leading to bronchial obstruction with recurrent pneumonia, chest pain, wheezing and hemoptysis (5). 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 (10). Although urinary level of 5-HIAA and serum level of chromogranin A are elevated in patients with carcinoid tumor (3) we couldn't determine our patient's result.

Surgery is the only curative approach for patients with carcinoid tumors and lung saving surgeries are preferable especially for those tumors located peripherally (11). Outcome of surgery is excellent even for patients with local nodal metastasis that does not preclude definitive surgical treatment (12). 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 (3). 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% (3). Metastasis commonly occurs to mediastinal lymph nodes followed by liver (3).

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 him with clinical evaluation, radiologic imaging with chest CT scan and bronchoscopy as the chance of recurrence is higher for patients with larger tumor size. He has no evidence of recurrence or metastasis.

Conclusion

Although the world is over burdened by Covid-19 pandemic crisis, other lung pathologies are also still present in communities. In such challenging circumstance diagnosing rare pulmonary diseases like bronchial carcinoid tumor needs high index of suspicion and meticulous diagnostic work up. 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.

Abbreviations

CT - computerized tomography

IASCLC - International Association for the Study of Lung Cancer

RT PCR- Reverse Transcription Polymerase Chain Reaction

SPHMMC – St. Paul's Hospital Millennium Medical College

WHO - World Health Organization

Declarations

Ethics approval & consent to participate: Clearance was obtained from the Institutional Research and Ethics Review Committee (IRB) of SPHMMC for the publication of the case report

Consent to publish: 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

Availability of data and materials

All data related to the outcome are included in the manuscript.

Competing interests

All authors declare that they have no competing interests.

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Author's contribution

EM: Participated in the surgery, conceived and conducted the study, did literature search

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Figures

Figure 1

Chest CT scan showing enhancing, lobulated right lung middle lobe soft tissue mass infiltrating bronchus intermedius.

Figure 2

Bronchoscopic picture showing obstructive bronchus intermedius endobronchial mass

Figure 3

Intra-operative picture showing 8cmx6cm lobulated, firm, mass involving the right lung middle lobe.

Figure 4

Histologic section showing uniform round cells with salt and paper chromatin