Case Report

Primary bronchial carcinoid: A rare differential diagnosis of pulmonary koch in young adult patient

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ABSTRACT

Bronchial carcinoids are uncommon, slow growing, low-grade malignant neoplasms comprising 1-2% of all primary lung cancers. They are thought to arise from neuroendocrine/Kulchitsky's cells of bronchial epithelium. Histological features range from low-grade typical to more aggressive atypical carcinoids. Clinically they may be asymptomatic, present with nonresolving recurrent pneumonitis, hemoptysis, or with paraneoplastic syndromes. Central bronchial carcinoids are more common than the peripheral type and are seen as endobronchial nodule or hilar/perihilar mass closely related to the adjacent bronchus. Chest X-ray may not show the central lesion due to its smaller size as is in our case. Contrast-enhanced computerized tomography (CECT) remains a highly sensitive examination which shows an intensely enhancing small rounded endobronchial nodule. We present a case of recurrent pneumonitis and hemoptysis in a young patient who showed features of typical central bronchial carcinoid in CECT and later confirmed with histopathological examination (HPE).

KEYWORDS: bronchial carcinoid, diagnosis, tuberculosis

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INTRODUCTION

Carcinoid tumors account for 0.5-2.5% of all primary lung tumors and are generally considered malignant.[1] The bronchial carcinoids are not related to exposure to any known carcinogen.

It is a low-grade malignant neoplasm believed to be derived from surface of bronchial glandular epithelium. Mostly located centrally, they produce symptoms and signs of bronchial obstruction such as localized wheeze, nonresolving recurrent pneumonitis, cough, chest pain, and fever. Hemoptysis is present in approximately 50% of the cases due to their central origin and hypervascularity.[2] Carcinoid syndrome was first recognized in 1954[3] as a clinical entity of a minority of neuroendocrine neoplasms which synthesize and secrete biologically active vasopeptides into the central circulation.

We report and emphasize the fact that a differential diagnosis of bronchial carcinoid is to be kept in mind apart from pulmonary tuberculosis in a young patient presenting with recurrent episodes of pneumonitis, hemoptysis, and pleural effusion.

Access this article online

Quick Response Code:

Website: www.lungindia.com

DOI: 10.4103/0970-2113.92366

CASE REPORT

A 28-year-old young adult male presented with history of fever and cough with sputum production for duration of 10 days. He also had history of dyspnea for 4 days and 2 episodes of hemoptysis.

Examination of the respiratory system revealed decreased breath sounds and dull note on percussion over right infrascapular area. No other positive signs were noted.

Hematological investigations showed a total count of 17,200 cells/cm, platelets 85%, lymphoctes 6%. His Liver function tests and blood sugar were normal.

PA view chest X-ray [Figure 1a] showed elevated right

hemidiaphragm, effaced right costo-phrenic angle, and nonvisualization of the right hilar shadow suggestive of right lower lobe collapse with minimal right-sided pleural effusion.

Based on X-ray findings pleural aspiration was attempted, but a dry tap was obtained. Aspiration was attempted under ultrasonographic (USG) guidance but no aspirate was obtained as the effusion was minimal [Figure 1b]. Further USG abdomen was done which was normal; no abnormality like focal liver lesions or intrabdominal adenopathy or ascitis was detected.

Provisional diagnosis of pulmonary tuberculosis was made. Three consecutive samples of sputum for AFB smear were negative. Gram stain revealed few pus cells with no bacteria and no fungal elements were seen in fungus smear.

In spite of antibiotics the patient continued to have right-sided chest pain, fever, and developed worsening dyspnea.

A follow-up chest X-ray [Figure 1c] showed right-sided moderate pleural effusion (much increased compared to previous study) occupying right mid- and lower zones, collapse and consolidation of right middle and lower lobes and mild mediastinal shift toward the left side. Thereafter the patient was evaluated with CT scan-nonenhanced computerized tomography (NECT) and CECT study.

The NECT study [Figure 2a] revealed a well-defined round-to-oval, smoothly marginated soft tissue density SOL with a mean density of 50 Hounsfield Unit (HU) measuring 14 × 8 mm in size located endobronchially in the proximal right main stem bronchus, partially obscuring its lumen. CECT [Figure 2b] with dynamic sequence was done which revealed intense enhancement of the lesion to 120 HU. Based on location, size, and contrast enhancement parameters a diagnosis of central bronchial carcinoid was made.

Other findings in CT were collapse and consolidation of right middle lobe (partial) and right lower lobe (total). Moderate right-sided pleural effusion was also noted.

The patient underwent bronchoscopy which showed a mass in the right bronchus intermedius. A transbronchial biopsy and histopathology of the mass showed features of a carcinoid tumor.

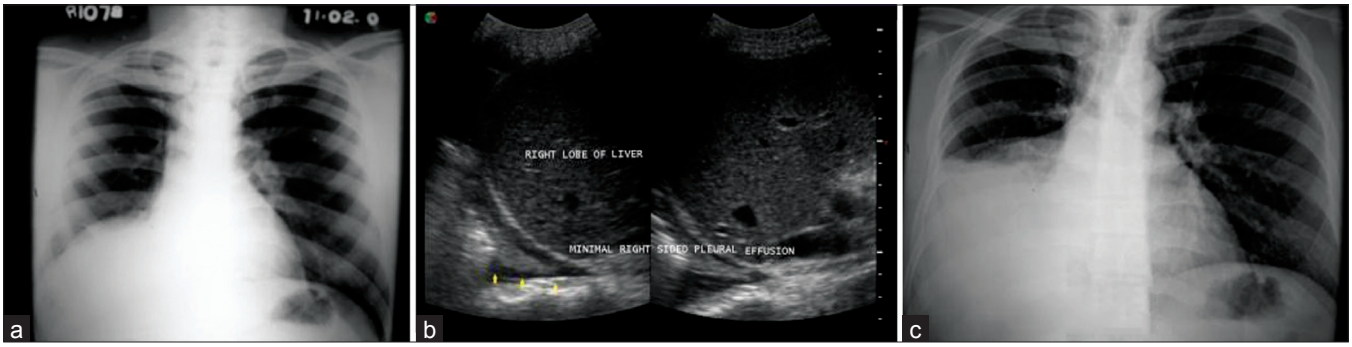

Figure 1: (a) PA view chest X-ray shows right lower lobe collapse with minimal pleural effusion; (b) USG image showing minimal right-sided pleural effusion; (c) Follow-up chest X-ray showing right-sided moderate pleural effusion, collapse, and consolidation of right middle and lower lobes

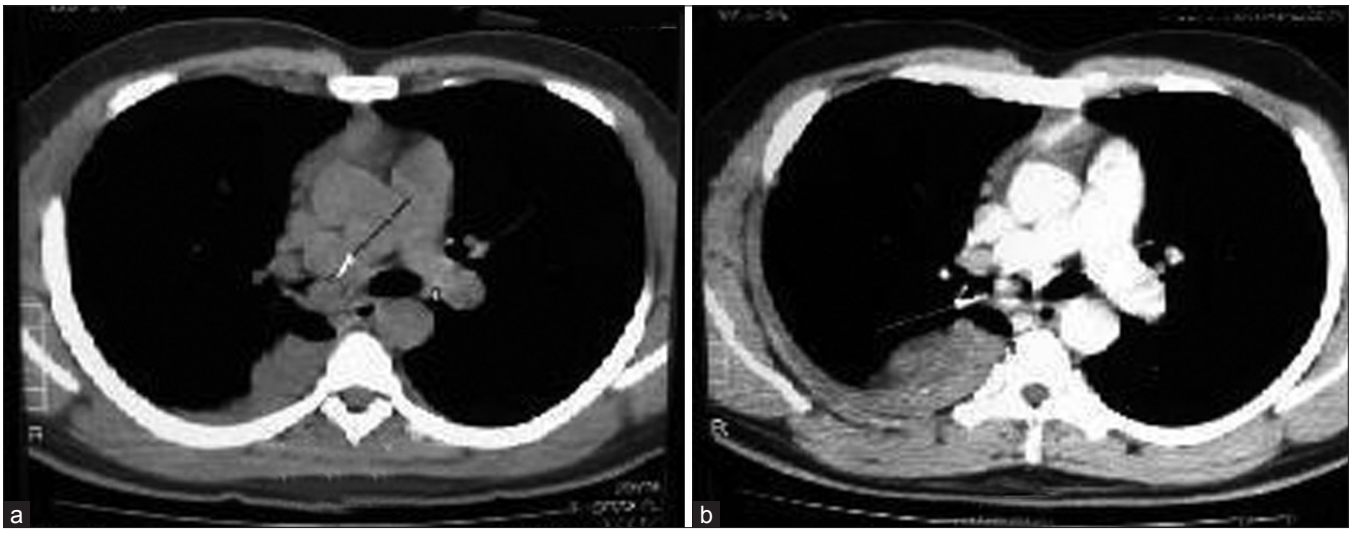

Figure 2: (a) NECT shows a soft tissue density SOL (50 HU) measuring 14 × 8 mm located endobronchially in the proximal right main stem bronchus partially obscuring its lumen; (b) CECT image showing marked enhancement of the endobronchial lesion up to 120 HU

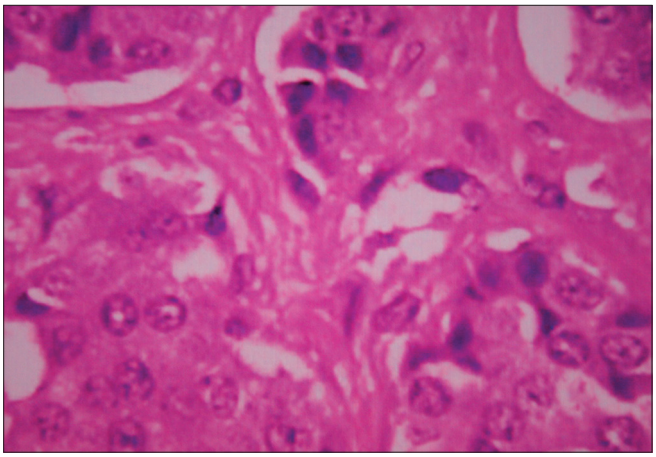

Figure 3: (H and E, ×400) shows nests of uniform tumor cells with stippled chromatin. Mitotic count was low

The patient underwent surgery where right middle and lower lobectomy with bronchoplastic repair was done. An immediate postoperative chest X-ray showed elevated right hemidiaphragm, minimal right-sided pleural effusion with intercostal drainage tube *in situ*.

Histopathology of the resected tumor (H and E, ×400) showed nests of uniform tumor cells with stippled chromatin. The mitotic count was low [Figure 3]. Immunohistochemistry showed positive staining for chromogranin consistent with the carcinoid tumor.

DISCUSSION

Bronchial carcinoids are rare neoplasms of lung representing 0.5-2.5% of all pulmonary neoplasms.[1] Having the potential to metastasize, they are considered true malignancies belonging to the neuroendocrine tumor family arising from enterochromaffin cells of the bronchial epithelium (Kulchitsky cells).[4]

They synthesize and secrete neuroendocrine peptides into the central circulation and their ability to synthesize serotonin from dietary tryptophan are suggested to be pathognomonic of carcinoids.[3]

Histopathologically, they are classified as typical carcinoids (TCs) and atypical carcinoids (ACs).[5] TCs have a favorable prognosis with a 10-year survival of up to 80-90%, compared to 40-60% in patients with ACs.[3]

Of the many histopathologic techniques available immunohistochemistry is considered to be the most sensitive and accurate in distinguishing TCs and ACs.

A diagnosis of bronchial carcinoids is often overlooked in young patients as in the absence of specific symptoms that accompany bronchial carcinoids, clinical diagnosis is controversial and difficult.[1]

Apart from symptoms like chest pain, pleural effusion, cough, wheeze, hoarse voice, or atelectasis,[3] common pulmonary manifestations are hemoptysis (18%), post obstructive pneumonitis (17%), and dyspnea in 2% of patients[3] all of which were noted in our case.

The symptoms depend on the location of the tumor; central or peripheral. Central tumors are mostly located in the right lung and cause hemoptysis or recurrent bronchial obstruction as noted in our case. Endocrine manifestations occur in 1-7% of cases including the carcinoid syndrome, which occurs in 86% of patients with liver metastases.

In our case no such symptoms were seen, and ultrasonography of abdomen was normal with no abnormal lesions were detected in the liver.

Chest radiographs are abnormal in 75-90% of cases. Peripheral carcinoids may present as solitary pulmonary nodule while central lesions are seen as hilar/perihilar mass with or without atelectasis, bronchiectasis, or consolidation. Majority of bronchial carcinoids arise in the large bronchi causing partial or complete obstruction as noted in our case. Cross-sectional studies like CT scanning and magnetic resonance imaging can detect bronchial carcinoid tumors more than 1-2 cm in diameter.[3]

CT scanning is useful in identifying endobronchial lesion, lymph node enlargement[2] and discloses small tumors occult in plain radiographs, as noted in our case.

In NECT, bronchial carcinoids are usually smooth, round, can be lobulated or contain calcifications and being highly vascular, enhance markedly on postcontrast CT.[6]

In our case, the tumor was 8 mm×14 mm in size which was well detected in NECT and showed marked postcontrast enhancement from 50 HU to 120 HU.

Biological behavior and prognosis for bronchial carcinoid tumor are better than other lung cancers. Surgical treatment requires radical excision and lymph node sampling. Survival and long-term outcome are significantly related to the histological type, nodal status, and pathological stage.[7] Tumors confined to bronchus are treated by sleeve resection and circumferential resection, provided that care is taken to ensure histologically negative margins. Other tumors may require lobectomy or pneumonectomy.

Complete excision is usually possible as in our case, as only 15% of tumors demonstrate metastases. Patients with typical bronchial carcinoids have an excellent prognosis, with 5, 10, and 15 year survivals of 92.4%, 88.3%, and 76.4% respectively.[3]

CONCLUSION

In conclusion, the present case illustrates clinical

diagnostic difficulties sometimes encountered in the work-up in a young adult patient with chest symptoms such as recurrent pneumonitis and hemoptysis. The differential diagnosis should include endobronchial tumors apart form more common infective etiologies like pulmonary tuberculosis. With a strong clinical suspicion aided with radiological investigations, especially with CECT, an early and accurate diagnosis of an endobronchial tumor can be made and adequate surgical treatment can be offered.

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How to cite this article: Bora MK, Vithiavathi S. Primary bronchial carcinoid: A rare differential diagnosis of pulmonary koch in young adult patient. Lung India 2012;29:59-62.
Source of Support: Nil, **Conflict of Interest:** None declared.