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Carcinosarcoma of the Lung Associated with Tuberculosis

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Abstract

Carcinosarcoma is an uncommon mixed tumor of the lung. It is composed of a mixture of carcinoma and sarcoma elements. We present a case of 64-year-old male with carcinosarcoma of the lung associated with tuberculosis involvement of the same site. The patient was admitted for cough, malaise and fever. Bronchial lavage culture revealed *M. tuberculosis*. Six months after completion of tuberculosis treatment, the patient was admitted for hemoptysis and headache. CT revealed a solid lesion at the left upper lobe anterior bronchus. Histopathologic examination of the bronchial biopsy specimen revealed carcinosarcoma. Cranial MRI showed a metastatic lesion in the cerebellum which was removed surgically. Four months later, the patient developed bilateral malignant pleural effusions, recurrent cerebellar and skeletal metastases and died in the intensive care unit following intubation for respiratory failure. We describe a case of pulmonary carcinosarcoma occurring at the same localization shortly after successful treatment of tuberculosis with reference to relevant literature.

Keywords

Carcinosarcoma, Tuberculosis, Lung Carcinoma

1. Introduction

Pulmonary carcinosarcoma is an exceedingly rare tumor of the lung, comprising approximately for only 0.2% - 0.3% of all lung malignancies [1] [2]. Patients are predominantly male smokers with a mean age of 65 years at diagnosis. Cough and hemoptysis are the most common presenting symptoms and the clinical course is aggres-

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sive [3] [4]. Lung cancer risk has been reported to be increased among persons with a history of tuberculosis, pulmonary fibrosis and chronic obstructive pulmonary diseases [5]-[7]. Although malignancies especially adenocarcinomas are well documented complications of chronic inflamatory states and association between pulmonary tuberculosis with consequent development of lung cancer has been reported, pulmonary carcinosarcoma occurring at the same site occurring shortly after successful treatment of pulmonary tuberculosis has not been described previously.

We report a case of pulmonary carcinosarcoma occurring shortly after successful treatment of pulmonary endobronchial tuberculosis.

2. Case Report

A 64-year-old male patient presented to Istanbul University Cerrahpasa Faculty of Medicine Internal Medicine Pulmonary Unit with complaints of cough, malaise and night sweats in the last 2 months. Patient's medical history included a history of pulmonary tuberculosis 20 years prior to presentation, cholesytectomy operation, hypertension and diabetes mellitus type 2 for 10 years. Patient did not smoke. The patient did not have a history of enviromental or occupational exposure to carcinogens. Chest CT revealed bilateral upper lobe consolidation consistent with reactivation tuberculosis. Bronchoscopy showed multiple easily bleeding, soft, white, and caseified lesions in the proximal mainstream bronchi on both sides (**Figure 1**). Acid Fast bacilli was demonstrated on direct smear examination of bronchial lavage. Biopsy of lesions revealed caseifying granulomas (**Figure 2**). *M. tuberculosis* complex growth was noted in lavage cultures and final diagnosis was endobrochial tuberculosis. The patient was commenced on streptomycin, isoniacid, rifampycin, pyrazinamide and ethambutol treatment for two months, followed by isoniacid, rifampycin and ethambutol treatment for another four months with uneventful recovery. Bronchoscopic examination following treatment revealed a completely normal bronchial system.

The patient presented again with hemoptysis, cough, headaches following a six months period of well-being after completion of the anti-tuberculous treatment. Chest CT showed an approximately 2.5 cm solid lesion compatible with malignancy in the left upper paramediastinal zone obliterating the ascending branch of the left pulmonary artery and the anterior bronchus of the left upper lobe (**Figure 3**). Bronchoscopy revealed a single submucosal lesion obstructing the orifice of the left upper lobe anterior bronchus while areas of prior endobronchial tuberculosis involvement showing complete resolution (**Figure 4**) with a normal appearence. Biopsy performed from this solid lesion revealed a two component neoplastic process. CK7 staining of the epithelial component, and vimentin staining of the spindle cell component were consistent with a bronchial carcinosarcoma (**Figure 5**). PET-CT imaging was performed (**Figure 6**) and revealed high FDG uptake of the primary mass (SUV: 12.6),

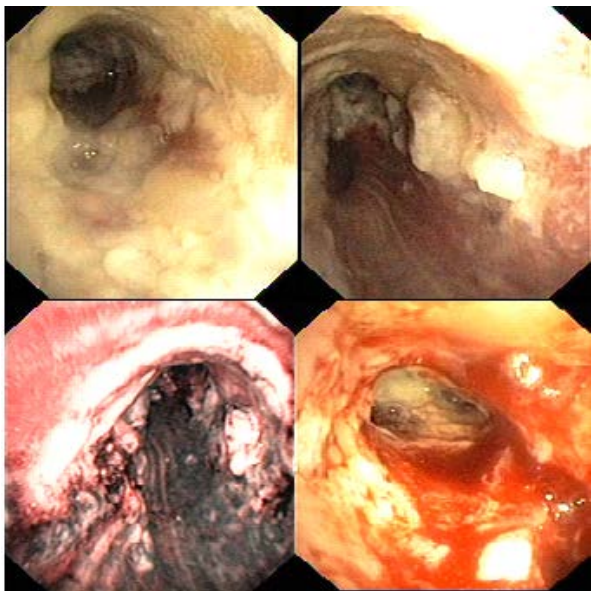

Figure 1. Bronchoscopy revealing endobronchial lesions consistent with endobronchial tuberculosis.

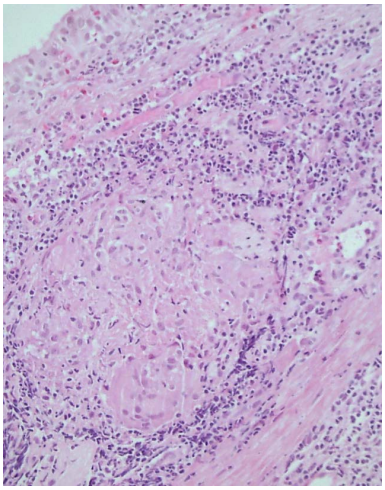

Figure 2. Endobronchial biopsy specimen showing a granuloma and lymphocytic infiltration.

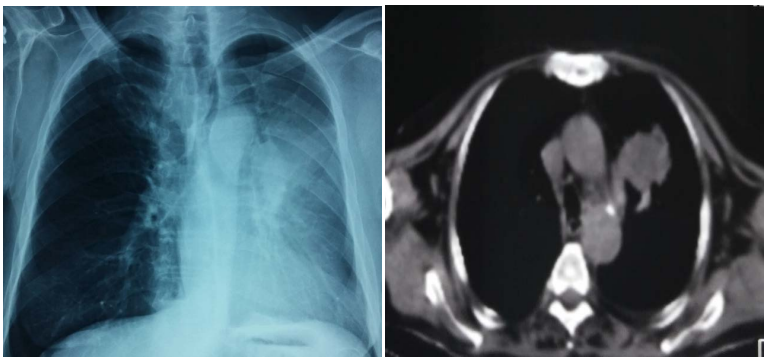

Figure 3. Chest X-ray and CT imaging revealing a large mass in the left middle zone.

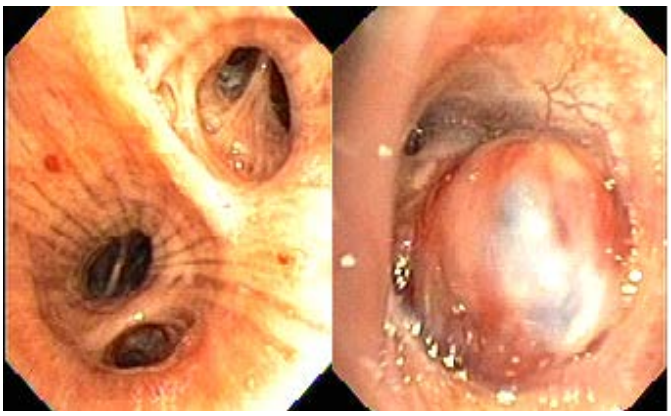

Figure 4. Bronchoscopy demonstrating complete resolution of endobronchial tuberculosis (left) and a 2 cm solid submucosal lesion with total obstruction of the left upper lobe anterior bronchus (right).

left hilar lymph nodes suggestive of malignancy and asymmetry in cerebellar FDG uptake, indicating metastasis (**Figure 7**) compatible with a stage IV lung carcinoma. Cranial MRI showed a cerebellar mass that was surgically removed and histopathology showed a poorly differenitated adenocarcinoma compatible with the metastasis of the carcinomatous component of the primary bronchial carcinosarcoma.

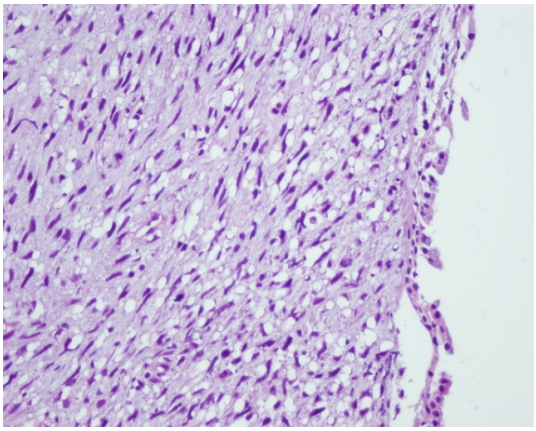

Figure 5. Biopsy sample showing spindle cell compatible with carcinosarcoma.

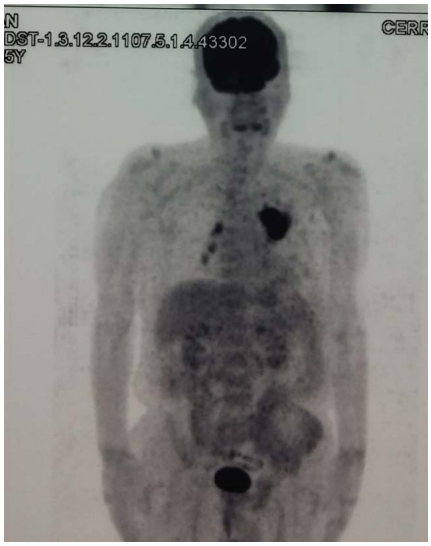

Figure 6. PET-CT scan performed following tissue diagnosis of carcinosarcoma with a high SUV at the lesion site.

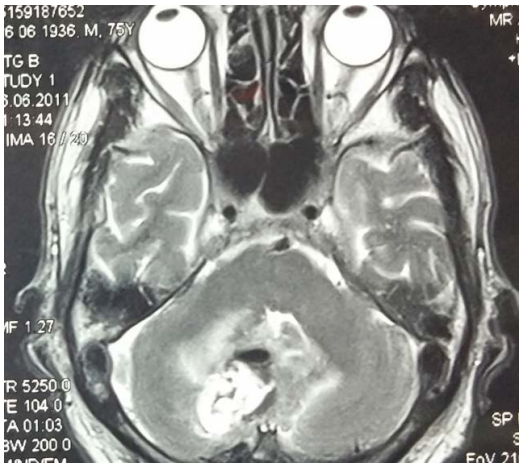

Figure 7. Cranial MRI showing a recurrent cerebellar metastasis in the right hemisphere following metastasectomy.

Four months later, the patient was admitted for recurrence of cerebellar metastasis, osteolytic bone lesions and bilateral malignant pleural effusions. Performance status was not adequate for administration of specific anti-neoplastic therapy, and palliative treatment was given. Mechanical ventilation was performed in the intensive care unit for significant respiratory distress and accompanying aspiration pnemonia. The patient did not respond to treatment and died one week later.

3. Discussion

Pulmonary carcinosarcoma is a rare malignant tumor accounting for only 0.2% - 0.3% of all lung malignancies. In a retrospective analysis of 2400 lung cancers, only seven patients had pulmonary carcinosarcoma while Diaconita reported eight cases among 3000 patients with malignant lung tumors [8] [9]. It is a mixture of carcinoma and sarcoma [9]-[11]. It is included in a group of poorly differentiated non-small cell lung carcinomas that contain a component of sarcomatoid differentiation. The average age of diagnosis is 60 years with men to women ratio of four to one and more than 90% of these patients are heavy smokers [1] [2]. The carcinomatous component is more often squamous carcinoma, followed by adenocarcinoma and large cell carcinoma; whereas the most common mesencyhmal component is poorly differentiated spindle cell carcinoma. Foci of rhabdomyosarcoma, osteosarcoma and chondrosarcoma are often present [2] [3] [11].

The carcinosarcomatous components are squamous cell carcinoma (46%), adenocarcinoma (31%), and adenosquamous carcinoma (19%) while the sarcomatous elements are rhabdomyosarcoma (51%), chondrosarcoma, and osteosarcoma. The carcinomatous elements are often displaced to the periphery, revealing rapid growth of the central sarcomatous elements. These form the bulk of the tumor. Immunohistochemical staining for keratin is positive for both the epithelial and mesenchymal components, suggesting the carcinosarcomas are of a monoclonal epithelial origin that has undergone sarcomatoid metaplasia. Metastases are found in lymph nodes, bone, kidney, liver and lung which usually contain only one of the components of the primary tumor. Complete surgical resection possible and the 5-year survival rate ranges between 21% and 49%. Endobronchial location and tumor stage do not correlate with survival. However, tumor size greater than 6 cm is associated with poor survival [2] [12]-[14].

Our case had three distinctive features. The first is that the epidemiologic evolution of the tumor is different what is currently known. The development of these tumors seems to be strongly associated with heavy cigarette smoking [1] [15]. The patient did not smoke and did not have any exposure to environmental or occupational carcinogens. The second and more important point is the development of the tumor following after a short period of successful anti-tuberculous treatment. Whether the tumor has developed as a sequelae of old or recent tuberculosis is unknown. However, histopathologic examination of the biopsy specimen did not reveal any chronic inflammatory changes associated with the previous tuberculosis infection the patient had twenty years ago.

Thirdly, carcinosarcomas appear as two distint groups, a central endobronchial type and a peripheral invasive type [16] [17]. Several investigators maintain that central endobronchial tumors have a better prognosis than do peripheral invasive tumors [16] [17]. However, this opinion appears be true when the tumor is small, less than 3 cm, and when no metastases are present [15]. The tumor measured by CT and bronchoscopic evaluation was less than three cm and had a central endobronchial localization. There were no known metastasis at the time of diagnosis. However, the patient had a very short survival and died six months after diagnosis. The aggressive behaviour of the tumor and the short patient survival is probably due to the poorly differentiated adenocarcinomatous component. Our case is in contradiction with what is currently known in literature.

4. Conclusion

We believe that our case is unique that previous old or recent tuberculosis infection may be associated with pulmonary carcinosarcoma. Occurrence of carcinosarcoma very shortly after reactivation tuberculosis may denote that the malignancy developed due to the current process. Pulmonary tuberculosis may be included in the etiology of pulmonary carcinosarcoma, as an inflammatory scar carcinoma leading to the adenocarcinoma component of the tumor tissue in our case because there were no other risk factors in this patient including a smoking history. The poor prognosis of the patient is in great contradiction with the literature in regard to the small size of the initial tumor that may be associated with the poorly differentiated adenocarcinomatous component of the tumor.

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