Original Research Paper

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Pulmonology

COEXISTENCE OF LUNG CANCER WITH PULMONARY TUBERCULOSIS

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KEYWORDS :

INTRODUCTION

Pulmonary tuberculosis has been found in 0.7% of cases of lung cancer. The presence of lung carcinoma is rarely suspected in patients with active tuberculosis and the diagnosis of lung cancer may be delayed because of masking by a tuberculous lesion [1]

Lung carcinoma (LC) is the leading cause of cancer-related death and one of the major public health problems worldwide [2]

Tuberculosis (TB) is an important cause of morbidity and mortality despite good prevention, diagnosis, and effective therapy, especially in the poor and developing countries. [3]

The two diseases may occur as follows:

a. Carcinoma occurs on the TB ground, reactivating the old focus of TB
b. Carcinoma develops from previous TB scars (scar carcinoma)
c. Carcinoma developing by epithelium metaplasia of tuberculous cavities
d. Both diseases are independent of each other and develop simultaneously or sequentially by chance
e. Metastatic carcinoma developing in an old TB lesion
f. Secondary infection of TB in a cancer patient. [4-6]

Here we present a case of a 52/M patient with no previous history of smoking, diagnosed with pulmonary tuberculosis and lung cancer.

Case Report

A 52-year-old male presented with complaints of breathlessness grade 3 mmrc , productive cough and fever for 1 month, and chest pain for 7 days. There was an associated history of loss of appetite, generalized body weakness for 1 month and weight loss of 4 kgs in 1 month. There was no complaint of hemoptysis. Patient is a known case of diabetes and hypertension since 10 years and is on regular treatment. The patient is a non-smoker and non-alcoholic.

On examination, the patient was moderately built, well nourished and comfortable at rest. His oxygen saturation was 98% on room air, respiratory rate 30/min, and pulse rate 88/min. There was no clubbing of the digits, no cyanosis and no lymphadenopathy. On auscultation, bilateral air entry was positive associated with bilateral coarse crepitations.

Rest of the physical examination was unremarkable. The routine blood hemogram, liver function test, and renal function test were within normal limits.

Chest x-ray: Homogenous opacity of the left upper lobe with mild pleural effusion in the left lung was noted.

Sputum for True Nat: Mtb was detected with intermediate resistance to rifampicin .

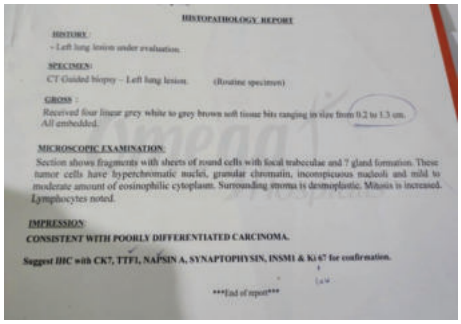
HRCT Thorax : - Large well defined soft tissue density lesion with irregular margins is seen in the upper lobe of the left lung with adjacent diffuse interstitial thickening, the lesion seen indenting the arch of aorta medially causing compression of the left pulmonary artery, the lesion is seen abutting the left main and upper lobe-bronchus ?Lung Malignancy

- Patchy ground glass areas are seen in the lingular segments of the upper lobe of the left lung
- Mild costal pleural thickening seen in the left lung.

PET-CT : 18F-FDG PET-CT scan shows FDG avid irregular lobulated heterogeneously enhancing soft tissue density mass lesion in left lung upper lobe measuring 84x56x85mm with SUV max of 20.77 with mass effect as described above the adjacent focal consolidation collapse and gross interstitial thickening.

Minimally avid left pleural effusion and mild irregular pleural thickening of left lung.

FDG avid enlarged aortopulmonary node measuring 26x24 mm with SUV max of 19.18. Mild avid mildly enlarged pretracheal, prevascular, lymphnodes, largest prevascular node measuring 18x13 mm with SUV max of 10.89 Histopathology report : Impression - consistent with poorly differentiated carcinoma.



HISTOPATHOLOGY REPORT

HISTORY :
- Left lung lesion under evaluation.

SPECIMEN:
CT Guided biopsy – Left lung lesion. (Routine specimen)

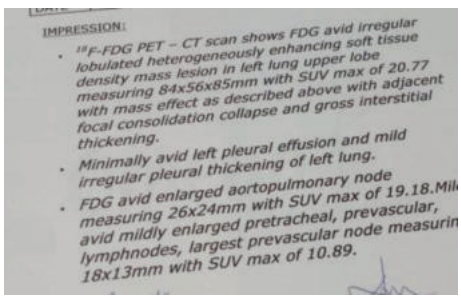
GROSS :
Received four linear grey white to grey brown soft tissue bits ranging in size from 0.2 to 1.3 cm. All embedded.

MICROSCOPIC EXAMINATION:
Section shows fragments with sheets of round cells with focal trabeculae and ? gland formation. These tumor cells have hyperchromatic nuclei, granular chromatin, inconspicuous nucleoli and mild to moderate amount of eosinophilic cytoplasm. Surrounding stroma is desmoplastic. Mitosis is increased. Lymphocytes noted.

IMPRESSION:
CONSISTENT WITH POORLY DIFFERENTIATED CARCINOMA.

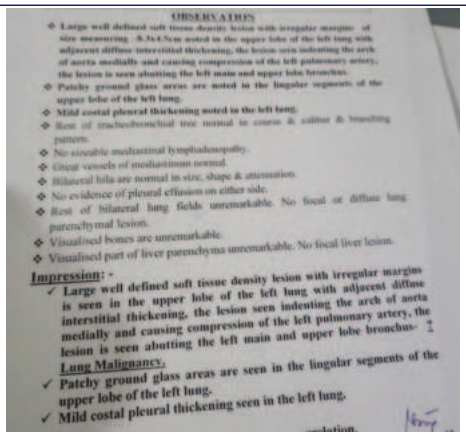
Suggest IHC with CK7, TTF1, NAPSIN A, SYNAPTOPHYSIN, INSM1 & Ki 67 for confirmation.

End of report



IMPRESSION:

- 18F-FDG PET – CT scan shows FDG avid irregular lobulated heterogeneously enhancing soft tissue density mass lesion in left lung upper lobe measuring 84x56x85mm with SUV max of 20.77 with mass effect as described above with adjacent focal consolidation collapse and gross interstitial thickening.
- Minimally avid left pleural effusion and mild irregular pleural thickening of left lung.
- FDG avid enlarged aortopulmonary node measuring 26x24mm with SUV max of 19.18.Mil avid mildly enlarged pretracheal, prevascular, lymphnodes, largest prevascular node measurin 18x13mm with SUV max of 10.89.



OBSERVATION

- Large well defined soft tissue density lesion with irregular margins of size measuring ~8.3x4.5cm noted in the upper lobe of the left lung with adjacent diffuse interstitial thickening, the lesion seen indenting the arch of aorta medially and causing compression of the left pulmonary artery, the lesion is seen abutting the left main and upper lobe bronchus.
- Patchy ground glass areas are noted in the lingular segments of the upper lobe of the left lung.
- Mild costal pleural thickening noted in the left lung.
- Rest of tracheobronchial tree normal in course & calibre & branching pattern.
- No sizeable mediastinal lymphadenopathy.
- Great vessels of mediastinum normal.
- Bilateral hila are normal in size, shape & attenuation.
- No evidence of pleural effusion on either side.
- Rest of bilateral lung fields unremarkable. No focal or diffuse lung parenchymal lesion.
- Visualised bones are unremarkable.
- Visualised part of liver parenchyma unremarkable. No focal liver lesion.

Impression: -

- ✓ **Large well defined soft tissue density lesion with irregular margins is seen in the upper lobe of the left lung with adjacent diffuse interstitial thickening, the lesion seen indenting the arch of aorta medially and causing compression of the left pulmonary artery, the lesion is seen abutting the left main and upper lobe bronchus- Lung Malignancy.**
- ✓ **Patchy ground glass areas are seen in the lingular segments of the upper lobe of the left lung.**
- ✓ **Mild costal pleural thickening seen in the left lung.**

M TB detected case

NTEP Request Form for examination of biological specimen for TB

(Required for Diagnosis of T.B. Drug susceptibility Testing and follow-up)

Lab No: 137

Nucleic Acid Amplification Test (NAAT)

Drug susceptibility Test (DST) results

The connection between lung tuberculosis and lung or bronchial carcinoma certainly exists, as it has been verified by many pathologists and clinical doctors. In the tuberculosis field cancer can develop or in cancer-depleted patients tuberculosis develops secondary [7,8]

Bayle in 1810 was the first to report on the co-existence of pulmonary tuberculosis and bronchogenic carcinoma [9]. Fontenelle et al. reviewed 90 patients over a 12 year period who had coexistent bronchogenic carcinoma and pulmonary tuberculosis. Seventy-one patients (78.8%) had active tuberculosis. One third of the 90 patients underwent thoracotomy and lung biopsy for diagnosing cancer [10]. Ting et al. proposed several plain radiographic features which should increase the suspicion of coexisting lung carcinoma in a patient with pulmonary tuberculosis the foremost of which was progression of pulmonary infiltrates while the patient was on anti tuberculosis drugs as was seen in our patient [11]. In a study to identify factors causing delay in diagnosis of lung cancer, Chandra et al. found that of 123 patients with lung cancer, 23 (17%) had been labelled initially as suffering from pulmonary tuberculosis. But of the 23, only 3 had bronchial wash positive for tuberculosis [12]. Wu et al. [13]. proposed the theory of 'reverse causality' which explains that occult lung cancer may provoke reactivation of latent TB infection by weakening host immune mechanisms and the lung cancer is usually diagnosed in the 6-9 months of TB treatment.

TB treatment consisted of two months of HRZE (H:isoniazid, R: rifampicin, E: ethambutol, Z: pyrazinamide) plus 10 months of of HR. [14]

The treatment should be given for a total of 1 year. As risk of relapse is very common in such patients as they are immunosuppressed.

Patients with lung cancer are vulnerable to develop active TB because of immunosuppression induced by the use of intensive treatment modalities, such as aggressive chemotherapy, radiotherapy, or malnutrition.

Tuberculous bacilli may live at a dormant status in granulomas and induce TB sensitivity [15] If the local immunity is deteriorated, reactivation of a latent TB, primary mycobacterial infection, or new exogenous infection may cause TB infection. [16-17]

The responses to anti-cancer treatment were defined according to the response evaluation criteria in solid tumors (RECIST 1.1) [18] and accessed by chest computed tomography every two chemotherapy cycles. Since one month after the initiation of anti-tuberculosis treatment, sputum smear were performed on consecutive 3 days every month. The outcome of anti-tuberculosis treatment was defined according to the World Health Organization's definitions [19]. The side effects of chemotherapy were graded using the National Cancer Institute Common Terminology Criteria for adverse events, version 4.0 [20]

DISCUSSION

Malignant tumors are characterized by an enormous proliferation of the cells with the tendencies of destruction and capture of normal tissue anarchically with the formation of metastases. Long-term TB process, especially if it takes up larger portions of the lungs leads to metaplasia of the epithelium of bronchi and alveoli. Such metaplasia can be considered as a precancerous condition.

CONCLUSION

A significant association exists between TB and the subsequent risk for metastasis among primary cancers and comorbidities. Clinicians must be aware of the protean manifestations of TB and cancer and keep a high index of suspicion for simultaneous and/or misleading clinical and radiological presentations. Early TB diagnosis and antitubercular treatment may extend median survival in cancer. Therefore, TB patients should be evaluated for the subsequent risk of secondary lung cancer.

Patient was put on antitubercular treatment and was referred to the oncology department for further management of Lung Cancer.

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