

## CASE REPORT

### A CASE OF CONCOMITANT ADENOCARCINOMA OF LUNG AND PULMONARY TUBERCULOSIS IN A YOUNG FEMALE

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#### HOW TO CITE THIS ARTICLE:

Pujari Vishwanath V, Bhagwat Shraddha V, Rajurkar Sourabh B. "A Case of Concomitant Adenocarcinoma of Lung and Pulmonary Tuberculosis in a Young Female". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 30, July 28; Page: 8328-8332, DOI: 10.14260/jemds/2014/3050

**ABSTRACT:** 28 year female presented to us with X-ray chest suggestive of right opaque hemithorax. She was on anti-tubercular treatment for the presence of Acid Fast Bacilli (AFB) in pleural fluid. Clinical examination revealed bronchial breathing on right side. CT thorax showed large mass lesion in right hemi thorax with mild pleural effusion. Thoracocentesis and bronchoscopy showed no evidence of malignancy however AFB were detected in bronchial washing. Transthoracic biopsy was positive for malignancy. On Immunohistochemistry (IHC), Thyroid Transcription Factor 1(TTF1) and NAPSIN A were positive, confirming the diagnosis of adenocarcinoma lung. Final diagnosis of primary adenocarcinoma lung with concomitant tuberculosis was established.

**KEYWORDS:** Adenocarcinoma of lung, Immunohistochemistry, Tuberculosis.

**MESHTERMS:** Adenocarcinoma of lung, Immunohistochemistry, Tuberculosis.

**INTRODUCTION:** Lung cancer is the most common cause of major cancer incidence and mortality in men, whereas in women it is the 3<sup>rd</sup> most common cause of cancer incidence and the 2<sup>nd</sup> most common cause of cancer mortality.<sup>1</sup> Tuberculosis is also a leading cause of mortality and morbidity in developing countries like India. Adenocarcinoma is the most common lung malignancy with peak incidence between 61 to 70 years of age. It is the most frequently diagnosed subtype in women and in non-smokers. Association of pulmonary tuberculosis with lung cancer has been reported in few studies.<sup>2,3</sup>

**CASE REPORT:** A young married female, aged 28 years, with no history of any addictions, presented with complaints of dry cough, right sided diffuse, dull aching chest pain and breathlessness along with anorexia and weight loss over three months. At the time of presentation, she was on anti-tubercular treatment for right sided pleural effusion on the basis of presence of acid fast bacilli (AFB) in pleural fluid. She was referred to us for further management as she had right opaque hemi thorax on chest X-ray (Fig. 1).

General examination was normal except for pallor. Respiratory system examination showed diffuse bulge of the chest on right side. Bronchial breathing was heard in right mammary and inter-scapular areas. Breath sounds were decreased in right infra-mammary, infra-axillary and infra-scapular areas.

On routine investigations, hemoglobin was 7.9gm/dl. Liver and renal functions were normal. USG thorax revealed mild pleural effusion. CECT thorax showed large heterogeneously enhancing cystic mass in right hemithorax with nodular pleura and mild pleural effusion. A nodule was seen in contra lateral lung with mediastinal lymph node involvement (Fig. 2a & 2b). CECT abdomen showed no significant abnormality. 50cc hemorrhagic fluid was aspirated by thoracocentesis which was lymphocyte predominant with total proteins 3.6 g% and negative for malignant cells and AFB.

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Serum lactate dehydrogenase was elevated (2246U/l).  $\beta$ -HCG and Alfa feto protein were within normal limit, excluding germ cell tumor as a possible etiology. Fiberoptic bronchoscopy showed no endobronchial lesion. Bronchial washings were negative for malignant cells but showed AFB on smear. Transthoracic biopsy of lung mass was positive for malignancy (Fig. 3a); however sub-typing was not possible on histopathology alone. On IHC tumor cells stained positive for TTF1 (Fig. 3b) and NAPSIN A (Fig. 3c) and negative for p63, confirming the diagnosis of primary lung adenocarcinoma. She was continued on anti-tubercular treatment and was started on Gefitinibas advised by oncologist.

**DISCUSSION:** Incidence of lung carcinoma is increasing in India.<sup>4</sup>Non-Small Cell Lung Carcinoma accounts for 80-85% of all lung carcinomas and adenocarcinoma is the predominant histologic type with male preponderance.<sup>4</sup>Nowadays incidence of Adenocarcinoma lung is increasing in women and non-smokers. Our patient presented with large mass involving entire right hemi-thorax at a young age.<sup>5</sup> Pleural fluid and bronchial washing showed the presence of AFB. Yield of detecting AFB in pleural fluid is low (01%).

Coexistence of adenocarcinoma and pulmonary tuberculosis is rare. In the study by Karnaket al<sup>6</sup>, pulmonary tuberculosis and malignancy co-existed in 73 patients, with lung cancer being the most common. It mainly exists in elderly people due to relatively high incidence of both TB and malignancy in this age group. However, in this case, a young female suffered from it.

A cohort study from Taiwan showed an increased risk of lung cancer in tuberculosis patients with hazard ratio of 3.3 after adjusting for confounding factors, such as COPD and smoking-related cancers other than lung cancer.<sup>7</sup>It is suggested that the mycobacterial cell wall components induce the production of nitric oxide and reactive oxygen species causing DNA damage, inhibition of apoptosis and leading to cancer formation.<sup>7-10</sup>

In this patient, tumor cells stained positive for TTF1 and NAPSIN A and negative for p63 on IHC, confirming the diagnosis of adenocarcinoma lung. TTF1 is a tissue specific transcription factor expressed on thyroid and lung with specificity 97-100% and sensitivity 54-75% for adenocarcinoma.<sup>11</sup>

NAPSIN A is a functional aspartic proteinase which is moderately sensitive (79-85%) and highly specific (100%) for adenocarcinoma. NAPSIN A is superior to TTF1 in distinguishing primary lung adenocarcinoma from other carcinomas.<sup>12, 13</sup> Tumor protein p63 is encoded by TP63 gene, a member of the p-53 family of transcription factors and considered as the single best marker to distinguish between squamous and adenocarcinoma lung, with a sensitivity of 84% and specificity of 85%.<sup>11</sup>

**CONCLUSION:** Coexistence of pulmonary tuberculosis and adenocarcinoma is rare and observed mostly in elderly population. In our case a young female had such a coexistence, making it a rare case.

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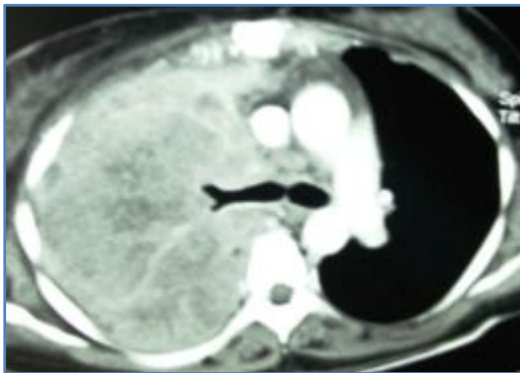
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**Fig 1: XRAY CHEST showing opaque right hemithorax**

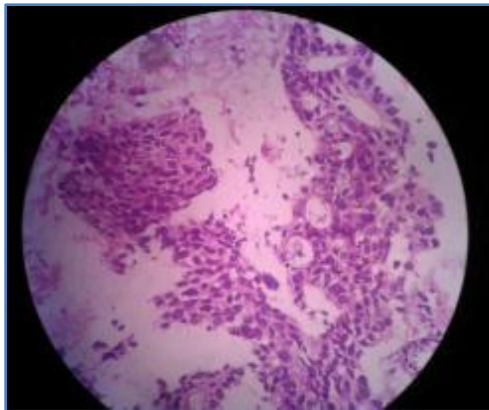
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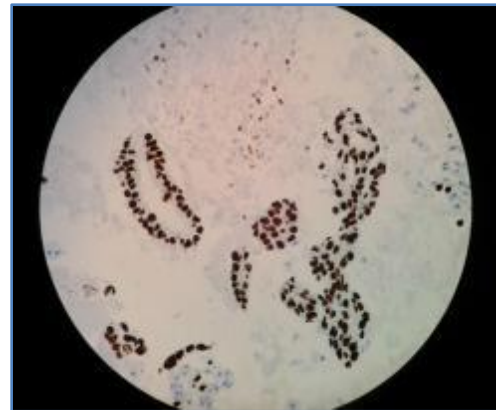
**Fig 2a: Axial cut section of CT chest showing large heterogeneously enhancing mass lesion on right side**



**Fig 2b: Axial cut section of CT chest showing nodular pleura with effusion**



**Fig 3a : Light microscopy (H & E) showing tumor cells arranged in a glandular pattern**



**Fig 3b: Photomicrograph showing tumor cells stained positive for TTF1**



**Fig 3c : Photomicrograph showing tumor cells stained positive for Napsin A**

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Date of Submission: 15/07/2014.

Date of Peer Review: 16/07/2014.

Date of Acceptance: 18/07/2014.

Date of Publishing: 22/07/2014.