Breast Metastasis from Adenocarcinoma of Lung: A Case Report

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ABSTRACT

Primary breast cancer is one of the most common malignancies in adult females, in which metastases to the breast represent approximately 0.4% to 1.3% of malignant tumours in the breast. We report a female patient of NSCLC with breast metastatic and discuss clinical, radiological and pathological differential diagnosis. A 30 years old female presented with complaints of cough with haemoptysis and worsening breathing difficulty since 1 month. Lung biopsy shows adenocarcinoma of lung. Patient started chemotherapy with pemetrexated and carboplatin. Clinical examination of the breast shows palpable lump. Patient had undergone breast biopsy to rule out second primary, morphology suggestive of adenocarcinoma. ALK mutation from the breast biopsy come positive, patient started on TKI. Metastasis to the breast, although a rare diagnosis, should be kept on the differential of a patient with primary adenocarcinoma lung cancer. Clinical examination, radiological findings, and immunohistochemistry are very helpful in reaching the proper diagnosis. It has a significant impact on the patient's treatment modalities and prognosis.

Key words: Breast metastasis, Lung cancer, ALK, TKI, Breast biopsy

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Conflict of interest: No

Case report is Original: YES

Whether case report publishes any where? NO

INTRODUCTION

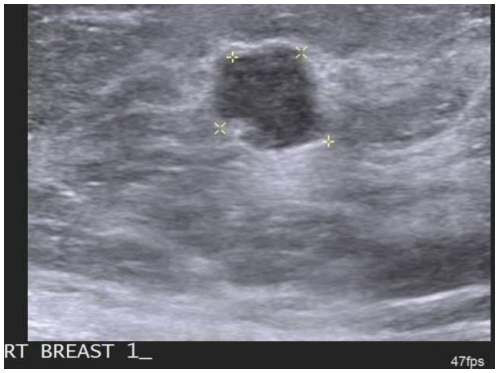
Breast cancer is the most commonly diagnosed malignancy in women [1]. Primary breast cancer is one of the most common malignancies in adult females; in which metastasis to the breast represent approximately 0.4% to 1.3% of malignant tumours in the breast [2, 3]. Secondary malignancy metastatic to the breast is uncommon with an incidence of 0.5% to 3% of patients with extra mammary malignancy [4, 5]. Other malignancies including ovary, prostate, stomach, malignant mesothelioma and rhabdomyosarcoma have been reported in several patients with breast metastasis [6, 7]. The lung is one of the most common cancer sites in terms of incidence and mortality and cases of pulmonary carcinomas metastasizing to the breast have also been

published [8, 9]. We report a female patient of NSCLC with breast metastasis and discuss clinical, radiological and pathological differential diagnosis.

CASE REPORT

A 30 years old female presented with complaints of cough with haemoptysis and neck pain from last 2 months. She had worsening breathing difficulty since 1 month. She was evaluated in her home town and suspected with tuberculosis and started on treatment. But her symptoms are worsened. She underwent endobronchial biopsy shows chronic inflammatory cells. Ultra sound guided FNAC of right lung showed positive for malignancy. She admitted here for further evaluation. PET CT (Figure 1) shows metastasis to bone, liver, mammary lymph nodes, supraclavicular lymph nodes and nodules in other parts of the body, suggests primary lung with metastasis. Lung biopsy reviewed in our hospital shows adenocarcinoma of lung. Patient started chemotherapy with pemetrexed and carboplatin. Clinical examination of the breast shows palpable lump. She was evaluated by breast mammogram (Figure 2) shows partially circumscribed opacity in upper quadrant of right breast; corresponding sonomammography reveals hypoechoic mass with angular margins BIRADS category IV. Patient had undergone breast biopsy to rule out second primary. Morphology suggestive of adenocarcinoma and IHC tested positive for TTF1 (thyroid transcription factor-1) and negative for Mammaglobin, GCDFP (Gross cystic disease fluid protein) (Figure 3). Patient tested negative for EGFR mutational status. ALK mutation status could not be done because of inadequate tissue biopsy. She was planned for 3 cycles of chemotherapy with pemetrexed and carboplatin. After 3 cycles clinically there was a progressive disease and hence stated with second line chemotherapy with taxanes and platinum's. Reassessment with PET CT after 3 cycles suggestive of progressive disease. Hence re biopsy was planned to rule out ALK mutation status from easily available breast lump. ALK was tested positive from the same. Hence patient was started on TKI with crizotinib. Patient is doing well till date on this therapy.

Lump In the Right Breast



Mammogram of Right Breast

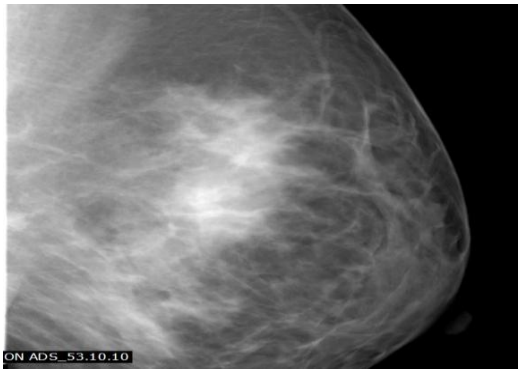


Figure 1: Breast Mammogram Images

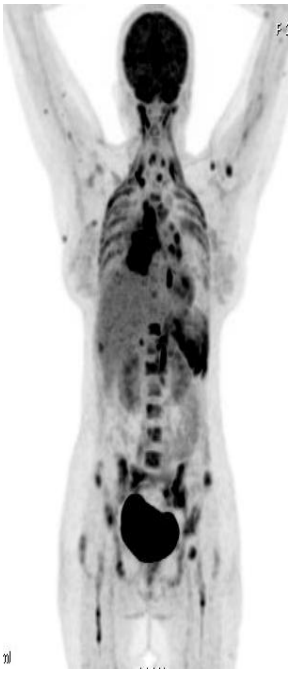
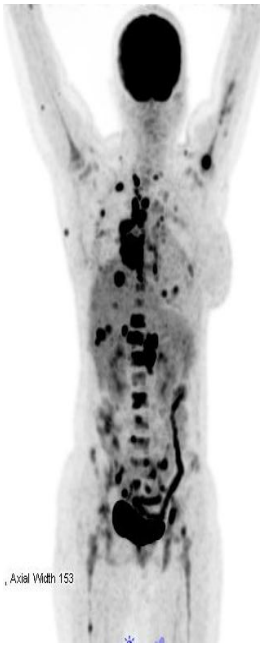
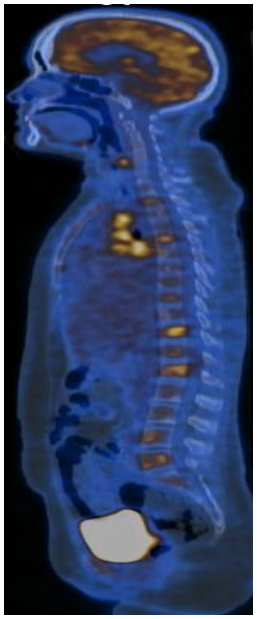


Figure 2: PETCT Images



(a) FDG-PET Images Before chemotherapy



b) FDG-PET Images After chemotherapy

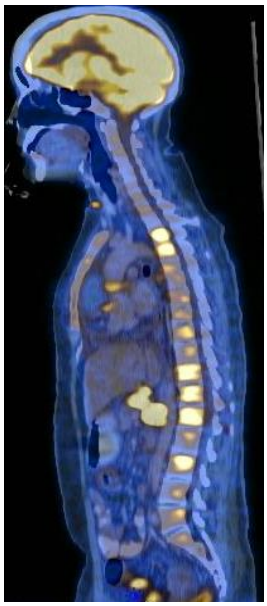
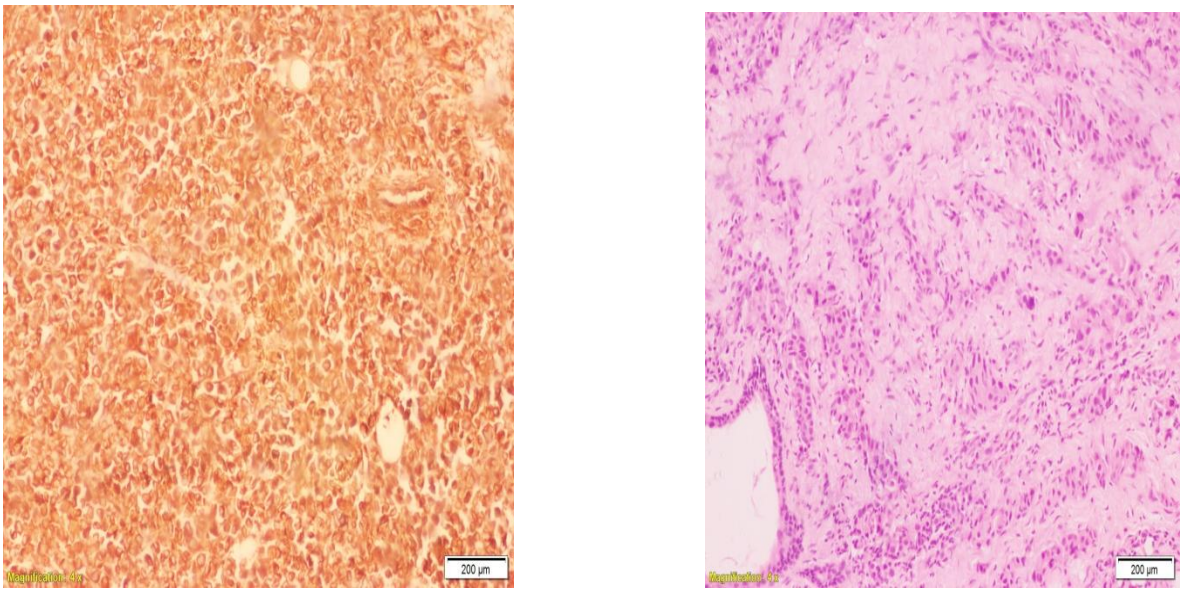


Figure 3: IHC images

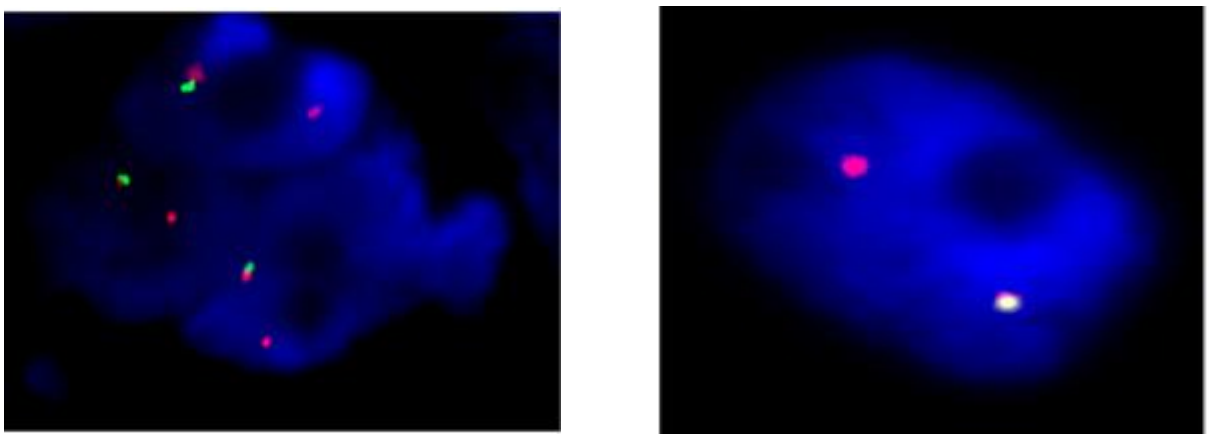


(a) **(b)**

a) IHC of breast biopsy showing carcinoma cells positive for TTF1

b) H/E stain of breast biopsy showing neoplastic ductal cells with moderate nuclear pleomorphism.

Figure 4: (a) FISH assay for diagnosing ALK rearrangement.Break apart signals (red and green) Positive. (b) Enlarged Image



DISCUSSION

The incidence of metastasis from newly diagnosed non-small cell lung cancer ranges from 11% to 36%. Common metastatic sites include the liver, adrenal glands, brain, bone, kidney and abdominal nodes [10]. Metastatic lesions of the breast only account for 0.4% to 6.6% of all breast malignant tumours, and this difference is due to the inclusion or exclusion of hematopoietic malignancies. Besides leukaemia or lymphoma, breast metastasis has been reported to be most commonly from melanoma, rhabdomyosarcoma, and the lung [11]. Differentiation between the primary and metastatic breast carcinoma is important in determining treatment plans. Metastatic mammary carcinoma is usually well-defined, and in the absence of characters of primary breast carcinoma such as distortion of adjacent architecture or micro calcification [11,12]. Multiplicity of the masses and absence of hormone receptors favour the diagnosis of metastatic lesions.

In this case, though breast lump on PET CT didn't show metabolic activity but tested positive for metastasis from lung. This highlights the importance of clinical examination and differential diagnosis to be considered in any breast lump. ALK positivity in breast biopsy may be one of its first occurrences as per literature till date.

CONCLUSION

We report a case of a rapidly growing breast metastasis from adenocarcinoma lung cancer with breast being its clinical site of metastases. Metastasis to the breast, although a rare diagnosis, should be kept on the differential of a patient with primary adenocarcinoma lung cancer. Clinical examination, radiological findings, and immunohistochemistry are very helpful in reaching the proper diagnosis. It has a significant impact on the patient's treatment modalities and prognosis.

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