Case Report:

Metastatic brachial plexopathy in breast cancer

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ABSTRACT

We report the case of a 29-year-old woman previously treated for breast cancer who presented 3 years later with pain weakness and burning sensation in the left upper limb of one month duration. Electroneuromyography showed reduced sensory nerve action potential (SNAP) amplitude and reduced conduction velocity in left median nerve sensory conduction, Magnetic resonance imaging (MRI) of brachial plexus revealed nodular thickening of trunks and cords of left brachial plexus, suggesting metastasis. Ultrasonography guided fine needle aspiration cytology confirmed the presence of metastatic ductal cell carcinomatous deposits. Brachial plexopathy due to metastases from breast cancer is a rare entity, and should be kept in mind while evaluating patients with breast cancer.

Key words: *Cancer, Breast, Metastasis, Brachial plexopathy*

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INTRODUCTION

Breast cancer is the top ranking cancer in women globally. The incidence of breast cancer is increasing in the developing world due to increase in life expectancy, urbanisation and adoption of western lifestyles. Worldwide, 1.38 million new cases of breast cancer were diagnosed in 2008.[1] Common sites of breast cancer metastases include regional lymph nodes, bones, liver, lungs and brain. Brachial plexopathy is a rare condition, which is a significant cause of pain and disability in breast cancer patients, with an incidence of less than 0.5%.[2] Metastatic breast and lung cancers are the most common non-traumatic causes of brachial plexopathy, after radiation induced fibrosis.[3] Because one of the major lymphatic drainage of the breast is through the apex of the axilla, it is not uncommon for metastatic breast cancer to invade the brachial plexus. Metastatic lymphadenopathy may encase the neurovascular bundle, resulting in vascular or neural symptoms.

CASE REPORT

A 29-year-old premenopausal woman presented to the Medical Oncology outpatient service with a complaint of a lump in her left breast. The patient had no other medical problems. She attained menarche at the age of 12 years. She was married and was mother of 2 children. There was no history of oral contraceptive use. There was no family history of breast or ovarian cancer.

On examination, the patient had a 5 x 4 cm lump in the upper outer quadrant of the left breast. Lymph nodes were palpable in left axilla and these lymphnodes were not fixed. The rest of the examination was unremarkable.

Mammogram showed a 2 x 2 cm hypoechoic nodule with irregular margins and specks of calcification in upper outer quadrant of left breast; right breast was normal. Fine needle aspiration cytology (FNAC) of the breast lump showed ductal carcinoma. Chest radiograph and ultrasonography of the abdomen were normal.

The patient underwent left modified radical mastectomy with axillary clearance up to level-III. The pTNM was T2N1Mx. Histopathological examination revealed the features of infiltrating duct cell carcinoma - not otherwise specified (NOS). Examination of the excised left axillary lymph nodes revealed metastatic duct cell carcinomatous deposits in 4 of the 10 lymph nodes. The tumour cells were negative for im-

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munohistochemical markers such as oestrogen and progesterone receptor proteins and p53 gene mutation, but tumour cells showed intense (3+) cytoplasmic positivity to c-erb-B2 protein.

Patient was given adjuvant chemotherapy consisting of 6 cycles of cyclophosphamide, 5- fluorouracil and doxorubicin. Thereafter, she was on regular follow up and was assessed to be in complete clinical remission. She did not receive trastazumab, lapatinib or adjuvant radiotherapy.

After 3 years, patient presented with complaints of pain, weakness and burning sensation in her left upper limb of one month duration. The electroneuromyography (ENMG) of the left upper limb showed reduced sensory nerve action potential (SNAP) amptitude and reduced sensory conduction velocity in the left median nerve. It also showed reduced compound muscle action potential (CMAP) from left deltoid, biceps and triceps muscles.

Ultrasound guided fine needle aspiration was performed from the thickened nodular lesion of the left brachial plexus. Cytological examination showed the presence of malignant cells, suggesting duct cell carcinomatous deposits in left brachial plexus (Figure 2). Patient was given second line chemotherapy with 4 cycles of paclitaxel. There was partial improvement in neurological symptoms.

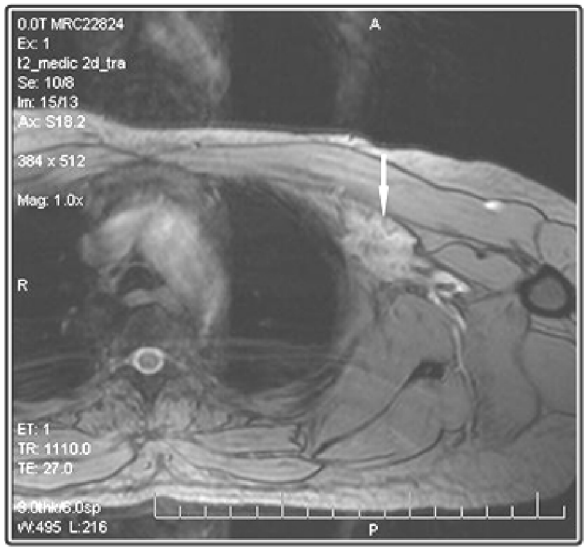

Figure 1: T2-weighted axial image showing altered signal intensity lesion along the trunks and cords of left brachial plexus (arrow)

DISCUSSION

Neoplastic invasion of the brachial plexus is an uncommon, though not rare, cause of plexopathy. Lesions of the brachial plexus occur secondary to neoplasms that reach the plexus by direct extension (Pancoast tumour) or, by metastases through lymphatics from the axilla. Primary neoplasms of the brachial plexus such as schwannoma and neurofibroma are generally benign, while secondary neoplasms are malignant. Patients with neoplastic brachial plexopathy may present with shoulder pain and paraesthesia with radiating pain onto the medial aspect of forearm and/or hand. Symptoms often are related to metastasis from a primary site such as breast, lung or from lymphoma in a generalized plexus involvement, sometimes with a lower trunk predominance. Symptoms may be diffuse but more often involve the C8-T1 dermatomes and myotomes (mimicking ulnar neuropathy or C8-T1 radiculopathy).

In patients with breast carcinoma who have symptoms of brachial plexopathy, radiation injury or metastatic spread of the tumour should be considered. About 95% of the patients with brachial plexopathy have shoulder and arm pain with a dermatomal distribution.[4] Our patient had intractable pain in the left upper limb. This pa-

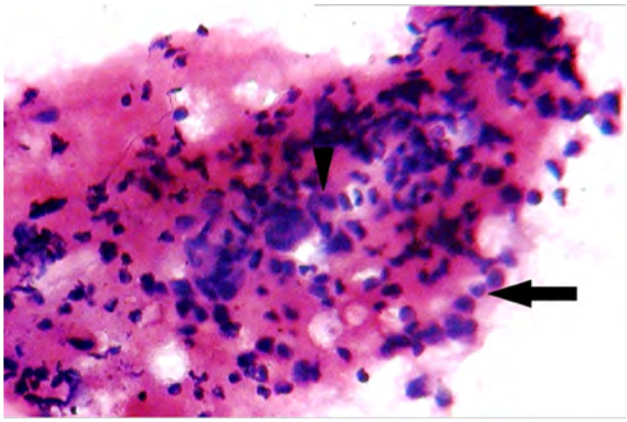

Figure 2: Photomicrograph showing pleomorphic epithelial cells (arrow) entangled in the midst of wavy elongated neuronal cells (arrow-head)(Haematoxylin and eosin, × 400)

tient did not receive radiation therapy because of financial constraints, thus radiation induced brachial plexopathy was excluded. As the patient had surgery three years before, complication due to surgery was not considered. The diagnosis of metastatic brachial plexopathy was suggested on MRI of the left brachial plexus and confirmed by FNAC. In conclusion, metastatic involvement of the brachial plexus is a rare condition but commonly associated with breast cancer. When patients with breast cancer present with severe pain spreading to the shoulder and arm followed by sensory and motor symptoms, brachial plexus metastases should be considered in the differential diagnosis.

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