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Case Report

Submandibular Gland Involvement, As an Unusual and the Only Site of Breast Cancer Metastasis, Detected in FDG PET/CT Study

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Abstract

We present a rare case of solitary submandibular gland metastases in a 40 years old lady after being treated for invasive ductal breast carcinoma about 10 years ago. She complained of swelling in her left submandibular region. Routine metastatic workup including bone scan and high resolution Computed Tomography (CT) scan of the abdomen and chest with intravenous contrast, were unremarkable. Whole body Fluro-Deoxy-Glucose (FDG) Positron Emission Tomography/ Computed Tomography (PET/CT) scan showed increased FDG uptake in the left mandibular gland, with relatively high SUV, which proved to be due to subglandular gland metastasis in the FNA histopathologic review and IHC.

Keywords: Submandibular gland; Breast carcinoma; Metastasis; FDG PET/CT

Case Presentation

A 40 years old woman with history of breast invasive ductal carcinoma treated with right mastectomy and chemo-radiation therapy 10 years ago, was referred to our nuclear medicine department for evaluation of recurrence. She complained of swelling in her left submandibular region that has occurred in the past 1 year ago and she did not receive any treatment during this period. Routine metastatic workup including high resolution Computed Tomography (CT) scan of the abdomen and chest with intravenous contrast, were unremarkable. Bone scanning with Tc99m-Methylen Diphosphonate (MDP) also did not show any abnormal uptake throughout the skeleton (Figure 1). After 6 hours of fasting, 229 Megabecquerel (Mbq) of FDG was injected and after 68 minute, whole body PET-CT scan was performed. The scan showed an FDG avid lesion in the left submandibular gland with relatively high standardized uptake value (SUV max=6.6) with no other area of abnormal FDG uptake throughout the body. Fine needle biopsy of the left submandibular gland was performed later. Histopathology report and the subsequent and Immunochemistry (IHC) result confirmed metastatic ductal carcinoma of the breast origin. Immunohistological study was positive for estrogen and progesterone receptors, and negative for Human Epidermal Growth Factor Receptor 2 (HER2) and the proliferative activity rate (Ki 67) was 8 to 10% (Figure 2).

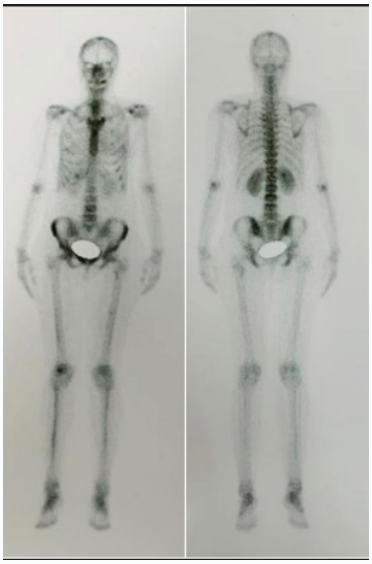

Figure 1: Bone scanning with Tc99m-Methylen Diphosphonate (MDP) also did not show any abnormal uptake throughout the skeleton.

Discussion

Salivary gland cancers are relatively rare and metastases to submandibular gland are less common. [1] There are few reports of parotid gland involvement as first presentation of recurrence in patients with breast carcinoma. [2].

Ductal carcinoma may occur as a primary salivary gland tumor that has histologic pattern similar to invasive ductal carcinoma of the breast but almost all salivary duct carcinomas are negative for estrogen and progesterone receptors. In our case, Immunohistological study was positive for estrogen and progesterone receptors and therefore metastatic form of breast carcinoma was confirmed.

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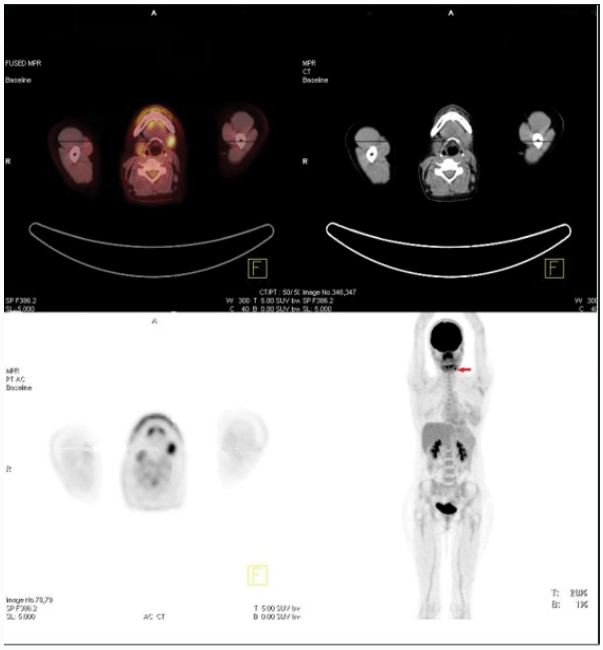

Figure 2: Immunohistological study was positive for estrogen and progesterone receptors, and negative for Human Epidermal Growth Factor Receptor 2 (HER2) and the proliferative activity rate (Ki 67) was 8 to 10%.

Asymmetric focal FDG uptake in submandibular glands needs ultrasound and fine needle biopsy. [3] Our case showed relatively significant uptake in the left submandibular gland with SUV more than triple of the liver mean SUV. As we know, this is the first case in the literature which showed solitary submandibular gland metastasis, with no other site of metastasis, detected in FDG-PET/CT study of a breast cancer patient. Although FDG uptake in salivary glands and tonsils are known as a normal variant in FDG PET/CT studies, attention should be paid when the uptake is asymmetrical or intense, even when the underlying malignant disease is not in the head and neck region.

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