Case Report

Rare Involvement of Thyroid Cartilage and Thyroid Gland by Multiple Myeloma on 18F-Fluorodeoxyglucose Positron Emission Tomography/ Computed Tomography

Abstract

Multiple myeloma commonly involves the skeleton. Extraosseous disease is sometimes noticed involving various organs. We present a very unusual site of myeloma involvement in the thyroid gland and thyroid cartilage.

Keywords: *18F-fluorodeoxyglucose, extraosseous, myeloma, thyroid cartilage*

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Introduction

Multiple myeloma is a disorder of plasma cells with propensity to involve multiple systems. Skeletal system is one of the common systems to be involved, with lytic lesions as the typical mode of presentation. Plasmacytoma is a collection of plasma cells in a tissue. Skeletal plasmacytomas are more common than extraskeletal ones. Extraskeletal plasmacytoma can occur in isolation or as a part of multi-system disease and can be seen in virtually any organ.

Case Report

A 54-year-old male patient presented with right shoulder swelling. Fine-needle aspiration of the lesion revealed plasma cells and a presumptive diagnosis of plasma cell disorder was made. The patient was referred for whole body 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) to evaluate systemic extent of disease. Imaging was done after 60 min of intravenous injection of 10 mCi of 18F-FDG. Images were acquired on a Philips Gemini GXL 16 Slice PET/CT. CT images were acquired with intravenous iodinated contrast and delay time of 35 s. CT was acquired at 120 kVp and automatic tube current, pitch 0.5, 5 mm thickness, 5 mm increment, and 250 mm field of view. PET images were acquired for 10 min over 2 table positions. The PET scan shows multiple areas of increased metabolic activity corresponding to lytic lesions involving the right scapula, cervical vertebra, manubrium, and multiple ribs [Figure 1].

In addition, an extraosseous site of disease was localized to the right lamina of the thyroid cartilage and also the right lobe of the thyroid gland. Needle aspiration of the lesion in the neck was done.

The fine-needle aspiration cytology smears revealed good cellularity comprising of thyroid acinar epithelial cells arranged in sheets along with plenty of discretely arranged typical and atypical plasma cells. Occasional cells show classic cytoplasmic inclusions [Figure 2].

The blood picture is consistent with microcytic normochromic anemia with hemoglobin of 9 gm% and total leukocyte count of 8800/cmm and platelet count of 282,000/cmm. Bone marrow evaluation revealed 60% plasma cells with a few binucleate forms. He had renal dysfunction with serum creatinine of 2.3 mg% (estimated glomerular filtration rate 50 ml/min) with normal calcium levels. Serum protein electrophoresis revealed an M-spike of 5.5 gm% with Ig G-Kappa type on immunofixation. Serum LDH was elevated, and serum beta 2-microglobulin was 7.9 µg/ml. Cytogenetic evaluation was negative for t(4;14), t(11;14), t(14;20), and deletion 17p.

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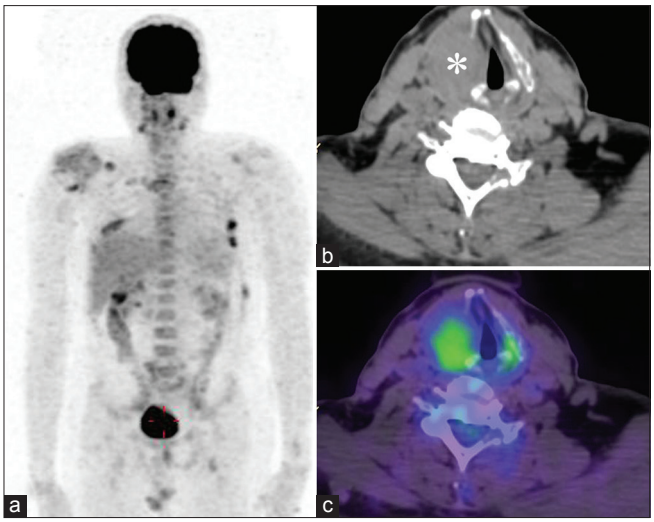

Figure 1: (a) Whole body maximum intensity projection showing multiple areas of increased abnormal metabolism including the right shoulder, ribs, thoracic vertebra, and in the neck on the right side. (b) Transaxial computed tomography image showing soft-tissue expansile lesion (*) in the right lamina of the thyroid cartilage. (c) Fused positron emission tomography/computed tomography image showing the lesion with increased fluorodeoxyglucose avidity. The lesion was also seen involving the upper pole of the right lobe of the thyroid gland

The patient was diagnosed as multiple myeloma Ig G-Kappa R-ISS 3, with extraosseous involvement of the thyroid gland and thyroid cartilage.

He was started on treatment with bortezomib, lenalidomide, and dexamethasone (VRD) regimen. He required palliative Radiotherapy for extreme pain in the neck secondary to the vertebral lesions. The patient had a good symptomatic improvement by the 1st month of treatment. After completion of 4 months of VRD regimen, he is in complete remission. He is presently awaiting autologous peripheral blood stem cell transplantation for prolonging remission duration.

Discussion

Multiple myeloma is a plasma cell disorder presenting with clonal plasma cell proliferation resulting in hypersecretion of immunoglobulins, anemia, hypercalcemia, and lytic bone lesions. Extramedullary plasmacytoma (EMP) is a localized collection of plasma cells that arise in tissues other than bone. Multiple studies have evaluated the incidence of EMP, estimated to occur in 10%–16% of cases in their natural course.[1-3] Prognosis of patients with extramedullary disease also appears to be less favorable.[4]

Head and neck region is the most common site of EMP accounting for 80% of involved sites. Myeloma involvement of the thyroid cartilage is a very rare phenomenon with only few reports published in the indexed literature.[5-8] In a case series of 272 cases of EMP, thyroid EMP accounted for 7 of them. We present another such rare involvement of the thyroid cartilage by myeloma with extension into the larynx along with the involvement of the thyroid gland.

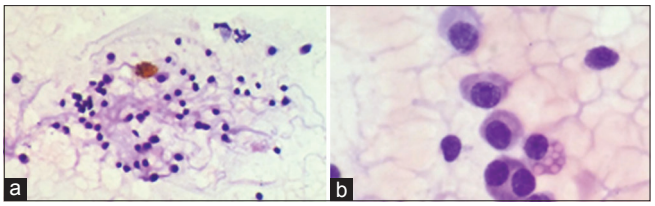

Figure 2: Fine needle aspiration cytology smears of the thyroid. (a) Showing discretely arranged atypical plasma cells admixed with follicle cells (H and E, ×40) (b) Binucleate plasma cells and Mott cells with abundant grape like inclusions (H and E, ×100)

Coexistent multiple myeloma has to be looked for in a case of EMP. The complete evaluation would include demonstration of M protein in serum and/or urine, clonal plasma cell proliferation in bone marrow examination along with evidence of myeloma-related end-organ damage. Such evaluation has revealed the presence of multiple myeloma with renal dysfunction and bone disease in the index patient.

The treatment of EMP would depend on the presence or absence of evidence of coexistent multiple myeloma. Anti-myeloma systemic therapy with proteasome inhibitors and/or immunomodulatory drugs controls EMP also and is the usual treatment employed if a coexistent multiple myeloma is present. Surgery and/or radiotherapy is the treatment option for solitary EMP, the choice of which depends on the location of involvement as well as expertise available. In the present case, a combination of VRD regimen has controlled the EMP of thyroid and pushed the multiple myeloma into complete remission.

EMP of the thyroid is a rare entity. Knowledge of this entity enables its recognition. A thorough work up to look for multiple myeloma is warranted for a holistic treatment approach. The presence of an EMP along with multiple myeloma portends a poorer prognosis and usually requires a multimodality treatment.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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