

When Location Misleads: Plasma Cell Neoplasm Diagnosed by Fine-Needle Aspiration Cytology

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Abstract

Plasma cell neoplasms (plasma cell dyscrasias) are a group of disorders characterized by the neoplastic proliferation of a single clone of plasma cells, which usually produces a monoclonal immunoglobulin and are rarely diagnosed in cytology. Fine-needle aspiration cytology (FNAC) in these patients may aid in early and definitive diagnosis, thus helping inappropriate management of such patients. We report a case of a 70-year-old male with swelling over the right-side clavicle. On ultrasound of the neck, an ill-defined heteroechoic solid lesion was noted in the subcutaneous and deep muscle planes, with underlying clavicle showing cortical discontinuity. FNAC aspirate exhibited sheets and scattered plasma cells and was diagnosed as a plasma cell neoplasm.

Keywords: Plasma cell neoplasm, fine needle aspiration cytology (FNAC), clavicle swelling.

Introduction

Plasma cell neoplasm is defined as an aberrant growth of clonal plasma cells that invades bone marrow, blood, or other organs and tissues.[¹] Plasma cell neoplasms and related disorders account for approximately 10% of hematologic malignancies and 15% of lymphoid neoplasm-related fatalities, the majority of which are caused by multiple myeloma.[²] Diagnoses of unusual plasma cell neoplasms might be difficult. Fine-needle aspiration cytology (FNAC) with cell block technique can be a simpler, less invasive, and more cost-effective approach for making an early diagnosis.[³] Our case is a rare presentation of plasma cell neoplasm in an unusual site diagnosed on FNAC which was further confirmed with serum protein electrophoresis.

Case Report

A 70-year-old male presented to the surgery department with swelling over the right-side clavicle for 1 month associated with right-sided nasal obstruction, right-sided blurring of vision, and right cheek swelling. On local examination, a swelling of size 6x5 cm was noted over the medial aspect of the right-side clavicle [Figure 1], hard in consistency and not associated with pain.

On ultrasound of the neck, an ill-defined heteroechoic solid lesion measuring 5.5x4.5x4.5 cm was noted in the subcutaneous and deep muscle planes, with the underlying clavicle showing cortical discontinuity. MRI of the brain showed an ill-defined lesion arising from the base of the skull extending into the nasal cavity and right maxillary sinus, ethmoid sinus, sphenoid sinus, and clivus. On computed tomography (CT) chest, a heterogenous solid non enhancing mass present in the medial end of the right clavicle with a fracture of the medial end of the clavicle -? neoplastic/? metastasis was given. [Figure 2]

FNAC of the lesion showed cellular smears with sheets and scattered plasma cells having eccentric nuclei with moderate to abundant cytoplasm. [Figure 3] A few of them are binucleated and multinucleated [Figure 4]. Serum protein electrophoresis was done, which showed an M-band monoclonal increase in beta-2 globulin, suggestive of monoclonal gammopathy with hypogammaglobulinemia. [Figure 5]



Figure 1: Clinical photomicrograph showing a swelling over the medial aspect of right-side clavicle.

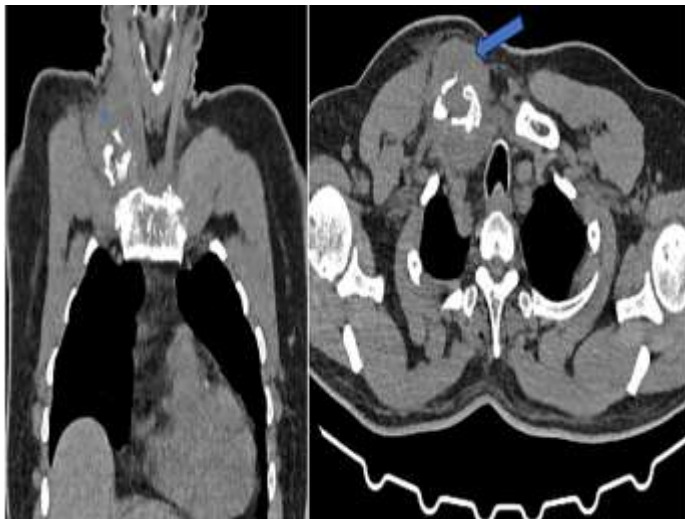


Figure 2: CECT image showing a well-defined heterogenous solid soft tissue mass the medial end of right clavicle (blue arrow), with osteolytic changes and fracture of medial end of clavicle causing mild mass effect over right sternocleidomastoid muscle, right infrahyoid muscle and right pectoralis muscles.

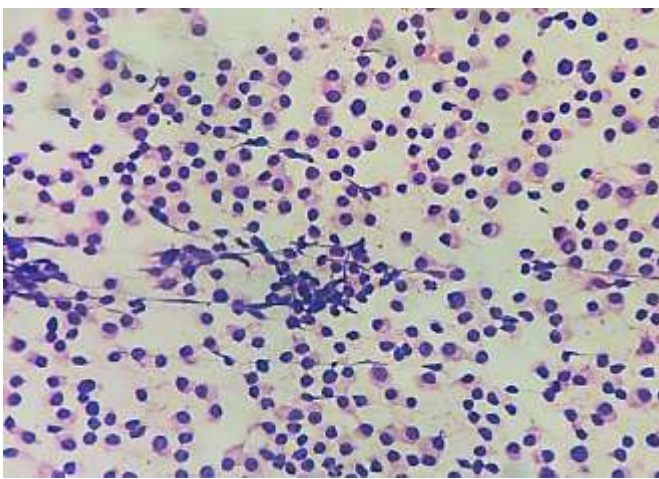


Figure 3: Photomicrograph of FNA smear showing sheets and scattered plasma cells with eccentric nucleus (H&E, 40X).

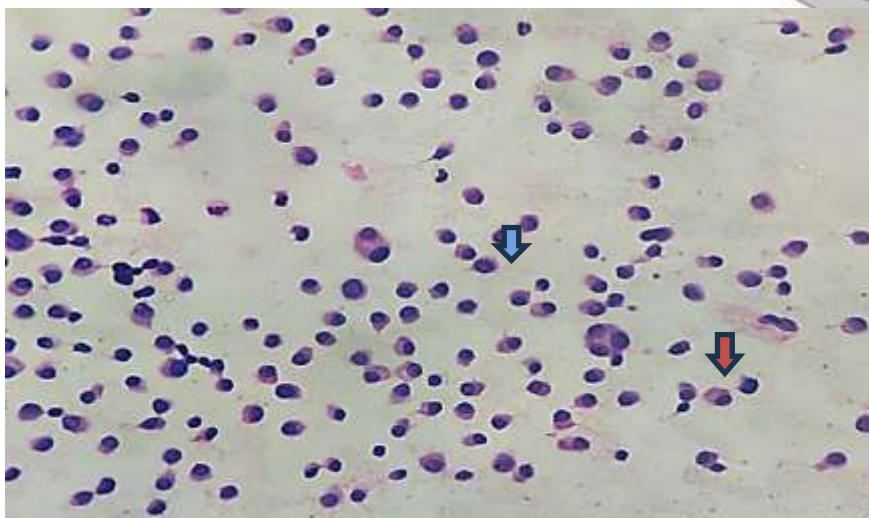


Figure 4: Photomicrograph of FNA smear showing binucleated (blue arrow) and multinucleated plasma cells (orange arrow) (H&E, 40X).

Name: [REDACTED] Sample No: 152317874
 Age: 70
 Sex: M

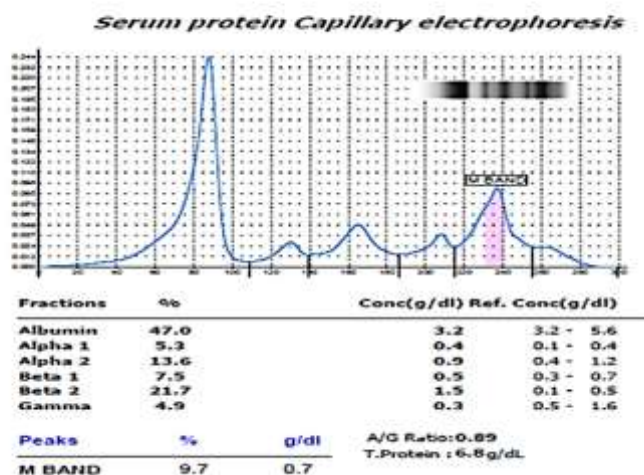


Figure 5: Serum protein electrophoresis showing an M-band monoclonal increase in beta-2 globulin.

Discussion

Plasma cell neoplasms are a diverse category of end-stage antibody-producing B-cell (or plasma cell) diseases. They are characterized by the growth of tumor plasma cells (PC), usually inside bone marrow (BM), with or without involvement of peripheral blood and/or other (extramedullary) tissues such as bone, soft tissues, or skin.^[4] Plasma cell neoplasms come in several forms. There is a monoclonal (or myeloma) protein (M protein) linked to all these disorders. These comprise multiple myeloma, solitary bone plasmacytoma, extramedullary plasmacytoma, and monoclonal gammopathy of unknown significance (MGUS).^[5]

Extramedullary plasmacytoma (EMP) are uncommon hematological malignancies that develop outside of the bone marrow and is mostly seen in the head and neck area (nasopharynx, nose cavity, sinuses, and tonsils).^[6] As a first-line treatment, FNAC may aid in the accurate diagnosis of unknown plasma cell disease and aid in distinguishing EMP from non-Hodgkin's lymphoma, infectious processes, and carcinoma-related

lesions. It is possible to make an accurate diagnosis quickly and start staging and treating patients right away.^[7]

Multiple myeloma (MM), on the other hand, is a disseminated tumor formed by the development of a single plasma cell clone that produces monoclonal immunoglobulin, typically class G (IgG).^[8] This clone of plasma cells multiplies in the bone marrow and frequently invades the neighboring bone, causing significant skeletal damage, bone pain, and fractures.^[9] Plasmacytoma and MM have similar cytomorphology, and the diagnosis of plasmacytoma can only be made when MM is ruled out. EMP can be misinterpreted as a mesenchymal tumor or lymphoma. FNAC is a simpler and faster approach to diagnose plasmacytomas, revealing sheets and clusters of plasma cells. A confirmed diagnosis of plasma cell neoplasm can be achieved using the cell block technique and immunohistochemistry (IHC).^[3]

In recent years, FNACs have been the initial investigation for clinically palpable lesions. FNAC diagnosis of plasma cell neoplasm at extramedullary sites allows for non-invasive verification of widespread involvement.^[10] Subsequent work-up and follow-up with these patients are required to rule out the presence of multiple myeloma. Thus, FNAC provides a rapid, reliable, and precise diagnosis of plasma cell neoplasms, allowing appropriate treatment to be initiated.

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