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EXTRAMEDULLARY PLASMACYTOMA OF THE SCALP REVEALING UNDERLYING MULTIPLE MYELOMA: A CASE REPORT

DR. SUBASH MOHAN THULASI
POSTGRADUATE, DEPARTMENT OF GENERAL MEDICINE, SAVEETHA MEDICAL COLLEGE AND HOSPITALS, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES, CHENNAI, TAMIL NADU, INDIA

DR. ASHA GOPAN G P
POSTGRADUATE, DEPARTMENT OF GENERAL MEDICINE, SAVEETHA MEDICAL COLLEGE AND HOSPITALS, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES, CHENNAI, TAMIL NADU, INDIA

DR. SORNAVALLI VALLIAPPAN
POSTGRADUATE, DEPARTMENT OF GENERAL MEDICINE, SAVEETHA MEDICAL COLLEGE AND HOSPITALS, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES, CHENNAI, TAMIL NADU, INDIA

DR. THILAGAVATHI VENKATESAN
PROFESSOR, DEPARTMENT OF HAEMATOLOGY, SAVEETHA MEDICAL COLLEGE AND HOSPITALS, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES, CHENNAI, TAMIL NADU, INDIA

Abstract

Background: Multiple myeloma is a plasma cell malignancy that typically presents with anemia, bone pain, hypercalcemia, renal dysfunction, and lytic skeletal lesions. Extramedullary plasmacytomas represent an uncommon manifestation, often occurring in the upper aerodigestive tract. Involvement of the scalp and skull vault as an initial presentation is extremely rare.

Case Presentation: We report the case of a 60-year-old male who presented with a progressive right scalp swelling of two months' duration, associated with pain for one week. Laboratory evaluation revealed hypercalcemia, normal renal function, and absence of urinary Bence Jones protein. Imaging demonstrated multiple lytic lesions in the skull and axial skeleton. Serum electrophoresis confirmed IgA kappa monoclonal gammopathy. Bone marrow examination revealed plasmacytosis with atypical plasma cells strongly positive for CD138. PET-CT confirmed multifocal lytic lesions. The patient was diagnosed with multiple myeloma with extramedullary involvement and initiated on a bortezomib, lenalidomide, dexamethasone (VRd) regimen along with intravenous zoledronic acid.

Conclusion: This case highlights an unusual initial presentation of multiple myeloma with scalp swelling due to extramedullary plasmacytoma. Recognition of such atypical manifestations is vital to prevent diagnostic delay. Review of literature emphasizes that extramedullary disease portends a poorer prognosis and requires prompt systemic therapy.

Keywords: Multiple myeloma, extramedullary plasmacytoma, scalp swelling, IgA kappa, lytic lesions

INTRODUCTION

Multiple myeloma (MM) is a clonal plasma cell disorder accounting for nearly 1% of all malignancies and approximately 10% of hematological cancers worldwide [1]. The disease is characterized by proliferation of malignant plasma cells in the bone marrow, monoclonal immunoglobulin production, and end-organ damage defined by the CRAB criteria (hypercalcemia, renal impairment, anemia, bone lesions). Although osteolytic bone lesions are typical, the occurrence of extramedullary disease (EMD) is increasingly recognized with advances in imaging.

Extramedullary plasmacytomas (EMP) may occur either in the setting of systemic myeloma or, rarely, as solitary lesions without marrow involvement. EMPs are reported in 7–18% of MM patients during the disease course, with prevalence higher in relapsed or refractory disease. Common sites include the upper aerodigestive tract, lymph nodes, liver, spleen, and skin. In contrast, EMPs of the scalp and skull vault are rare, with limited case reports available.

Extramedullary spread is associated with biological aggressiveness, resistance to therapy, and poor prognosis. Several mechanisms including altered adhesion molecule expression, angiogenesis, and clonal evolution under treatment pressure are implicated. Presentation as a scalp swelling poses a diagnostic challenge, as differentials such as metastasis, primary bone tumors, or meningiomas must be excluded.

We describe a patient who presented with scalp swelling, ultimately diagnosed as multiple myeloma with extramedullary involvement. This case is significant because it underlines an uncommon presentation of a relatively common malignancy and reinforces the importance of considering MM in the differential diagnosis of lytic skull lesions.

Case Presentation

A 60-year-old male, daily wage worker with no history of smoking, alcohol use, or toxin exposure, presented with swelling over the right side of the scalp for the past two months. The swelling was insidious in onset, progressively enlarging, and associated with pain for one week prior to hospital presentation. There were no systemic complaints such as fever, weight loss, anorexia, dyspnea, pedal edema, or urinary abnormalities.The patient was afebrile with stable vital signs (pulse 76 bpm, blood pressure 130/70 mmHg). Local examination revealed a 3 × 3 cm soft, non-tender, non-mobile swelling on the right parietal scalp without overlying skin changes (Figure 1). Systemic examination was unremarkable: cardiovascular system revealed normal heart sounds, lungs had bilateral air entry with normal vesicular breath sounds, abdomen was soft and non-tender, and neurological examination was within normal limits.

Baseline blood investigations showed hemoglobin 11.1 g/dL, total leukocyte count 5890/µL, platelet count 2.15 lakhs/µL. Serum calcium was elevated at 12.5 mg/dL. Serum creatinine was 1.3 mg/dL. Urine dipstick for Bence Jones protein was negative. X-ray of the skull revealed multiple lytic lesions (Figure 2). Chest X-ray revealed a pathological fracture of the right clavicle. CT scan of skull showed multiple lytic lesions involving the skull vault with soft tissue components (Figure 3).

Given the suspicion of plasma cell dyscrasia, serum protein electrophoresis with immunofixation was performed, which demonstrated a monoclonal IgA kappa paraprotein with associated hypogammaglobulinemia (Figure 4). Serum β2-microglobulin was elevated at 7000 ng/mL. Bone marrow aspiration and biopsy revealed hypercellularity with marked plasmacytosis, including binucleated and trinucleated plasma cells, some with immature morphology. Immunohistochemistry showed strong CD138 positivity, consistent with plasma cell myeloma.

A whole-body PET-CT was performed for staging, which showed multifocal, mildly FDG-avid lytic lesions in the axial and appendicular skeleton, confirming systemic myeloma with extramedullary disease (Figure 5). Hence patient was diagnosed to have multiple myeloma with extramedullary plasmacytoma of the scalp. The patient was started on the VRd regimen (bortezomib, lenalidomide, dexamethasone), with adjunctive intravenous zoledronic acid for bone protection. Analgesics were provided for symptomatic relief. At the time of reporting, the patient was tolerating chemotherapy well, with partial reduction in size of the scalp swelling.

DISCUSSION

Extramedullary disease (EMD) in multiple myeloma (MM) represents a distinct and aggressive manifestation characterized by plasma cell proliferation outside the bone marrow. EMD can present either at initial diagnosis (primary) or during relapse (secondary), with reported incidence varying between 7% and 18% in different series (1,2). Its presence is associated with an adverse prognosis, reflecting a more aggressive biology with clonal escape from the marrow microenvironment. Our patient presented with an unusual manifestation—right frontal scalp swelling associated with underlying skull lytic lesions—highlighting the diverse clinical spectrum of EMD.

Epidemiology and Risk Factors

EMD occurs more frequently in younger patients and has been associated with certain biological markers, including high-risk cytogenetics (t(4;14), del(17p)), plasmablastic morphology, and IgA isotype (3,4). In our case, the presence of IgA-kappa monoclonal gammopathy aligns with existing literature that identifies IgA subtype as a risk factor for extramedullary spread. Hypercalcemia, as observed in our patient, further reflects advanced bone involvement and aggressive disease biology.

Pathophysiology of Bone and Extramedullary Lesions

The development of lytic lesions in MM is primarily driven by uncoupled bone remodeling: increased osteoclast activity and suppressed osteoblast function due to dysregulated signaling pathways (RANKL, DKK1, sclerostin) (5). These mechanisms explain the multiple lytic lesions in the skull and clavicle in our patient, which facilitated cortical disruption and extension into soft tissues manifesting as a frontal scalp swelling. Unlike solitary plasmacytomas, the diffuse distribution of lytic lesions, hypercalcemia, and systemic findings in this case pointed toward multiple myeloma with secondary extramedullary plasmacytoma rather than a localized process.

Clinical Correlation with Present Case

The scalp mass in our patient underscores the rarity of cranial vault and scalp involvement in MM. While skull lytic lesions are relatively common, the extension into overlying soft tissue with clinically appreciable swelling is infrequently reported (6,7). Importantly, the swelling was painless initially and became symptomatic only in the week before presentation, mirroring the insidious nature of EMD. The absence of systemic "B" symptoms such as weight loss or fever demonstrates that EMD may present silently despite advanced disease.

Differential Diagnosis

The diagnostic challenge of scalp swelling with lytic lesions requires careful evaluation. Differential diagnoses include metastatic carcinoma (particularly from breast, lung, prostate), lymphoma, and primary bone tumors such as osteolytic sarcomas (8). The presence of monoclonal protein on serum electrophoresis, bone marrow plasmacytosis with CD138 positivity, and elevated beta-2 microglobulin established the diagnosis of MM with EMD in our patient. The absence of Bence Jones proteinuria, though not uncommon, highlights that negative urine studies do not exclude myeloma when other diagnostic criteria are met.

Role of Imaging

Cross-sectional imaging with PET-CT has revolutionized the detection of extramedullary lesions in MM, offering superior sensitivity compared to skeletal surveys (9). In our patient, PET-CT confirmed multifocal skeletal disease and quantified extramedullary involvement, reinforcing its value in both staging and monitoring therapeutic response. PET negativity of some lesions, as seen in this case, has also been reported in literature, reflecting the heterogeneity of myeloma cell metabolism.

Therapeutic Considerations

The VRd regimen—bortezomib, lenalidomide, and dexamethasone—is considered the current standard of care for newly diagnosed transplant-eligible and ineligible patients (10). Bortezomib's proteasome inhibition, lenalidomide's immunomodulatory properties, and dexamethasone's cytotoxicity form a synergistic backbone with proven efficacy even in EMD cases. Our patient demonstrated good initial tolerance with reduction in swelling size, underscoring the potential for early response even in aggressive variants.

Bisphosphonates, such as zoledronic acid, are recommended in all patients with myeloma and lytic bone disease to reduce skeletal-related events and improve quality of life (11). Their use in our case was appropriate, given the extensive skeletal involvement.

Prognostic Implications

EMD portends an inferior prognosis compared to marrow-confined MM, with studies reporting median overall survival of less than 3 years despite modern therapy (12). Factors such as high serum beta-2 microglobulin, plasmablastic morphology, and extramedullary soft tissue disease—as in our case—are consistently associated with poor outcomes. However, incorporation of proteasome inhibitors, immunomodulatory drugs, and monoclonal antibodies has improved outcomes in subsets of these patients.

Future Perspectives

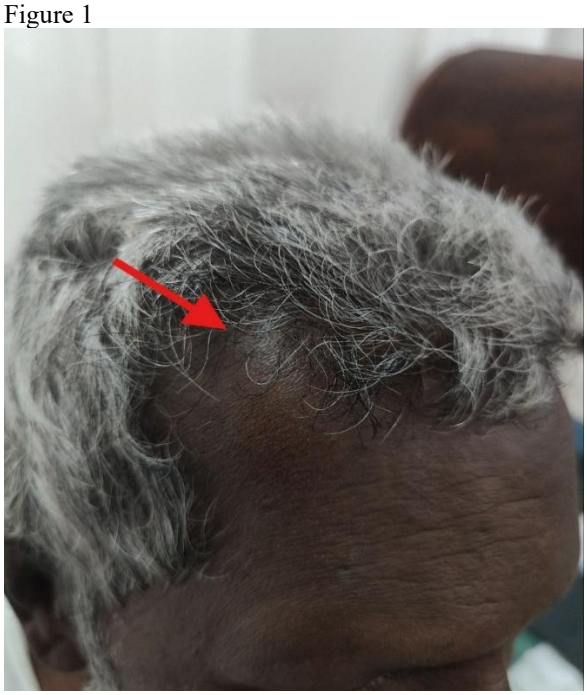
Emerging therapies, including monoclonal antibodies (daratumumab, isatuximab), bispecific T-cell engagers, and CAR-T cell therapies targeting BCMA, have shown promising results in refractory and extramedullary myeloma (13–15). Their role in first-line therapy, especially for high-risk EMD patients, is being actively explored. The present case illustrates the need for ongoing vigilance in detecting atypical extramedullary presentations and tailoring treatment accordingly.

REFERENCES

1. Weinstock M, Ghobrial IM. Extramedullary multiple myeloma. *Leuk Lymphoma*. 2013;54(6):1135–41.
2. Touzeau C, Moreau P. How I treat extramedullary myeloma. *Blood*. 2016;127(8):971–976.
3. Usmani SZ, et al. Clinical predictors of extramedullary disease in multiple myeloma. *Leukemia*. 2012;26(3):594–597.
4. Gagelmann N, et al. Extramedullary multiple myeloma: update on definition, risk factors, and management. *Ann Hematol*. 2021;100(9):2043–2056.
5. Terpos E, et al. Pathophysiology and management of bone disease in multiple myeloma. *Nat Rev Clin Oncol*. 2021;18(7):456–471.
6. Bladé J, et al. Extramedullary involvement in multiple myeloma. *Haematologica*. 2012;97(11):1618–1621.
7. Rasche L, et al. Incidence, characteristics, and outcomes of extramedullary disease in multiple myeloma. *Blood*. 2019;133(6):632–645.
8. Ooi GC, et al. Imaging of multiple myeloma: Present and future. *Clin Radiol*. 2016;71(9):747–756.
9. Zamagni E, et al. Role of imaging in multiple myeloma: PET/CT and MRI. *Blood Cancer J*. 2019;9(8):82.

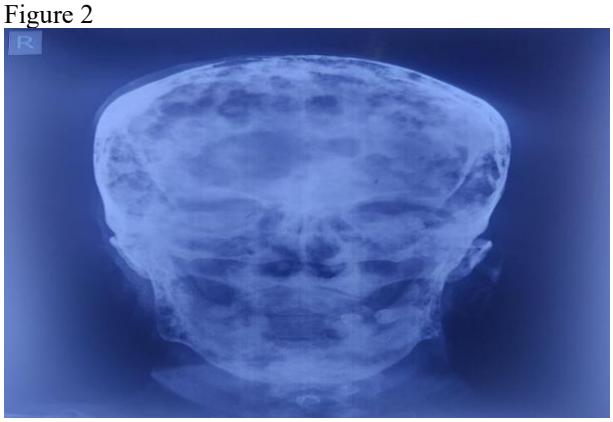
10. Rajkumar SV. Multiple myeloma: 2022 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2022;97(8):1086–1107.
11. Terpos E, et al. Management of bone disease in multiple myeloma: IMWG consensus. *Lancet Oncol*. 2021;22(3):e119–e130.
12. Short KD, et al. Clinical features and outcomes of extramedullary myeloma. *Leuk Lymphoma*. 2011;52(9):1647–1655.
13. Mateos MV, et al. Daratumumab for the treatment of multiple myeloma. *Expert Opin Biol Ther*. 2020;20(9):1029–1044.
14. Cohen AD, et al. B-cell maturation antigen–specific CAR T cells in relapsed or refractory multiple myeloma. *Blood*. 2019;133(7):540–550.
15. Rodriguez-Otero P, et al. Bispecific antibodies in multiple myeloma: a new era. *Blood Cancer J*. 2023;13(1):14.

Figure 1



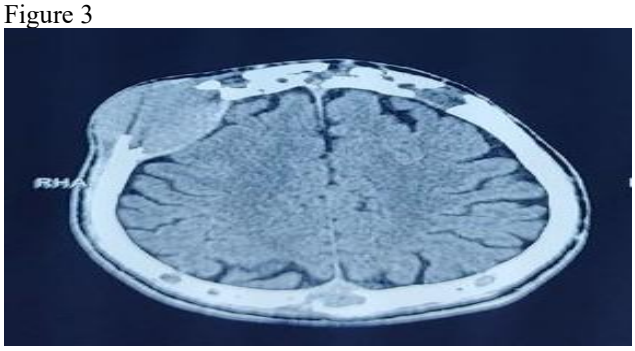
Clinical photograph of the patient at presentation, showing a right frontal scalp swelling (Red arrow) measuring approximately 3 × 3 cm. The lesion was soft in consistency, non-tender, non-mobile, and without overlying skin changes, representing an extramedullary manifestation of multiple myeloma.

Figure 2



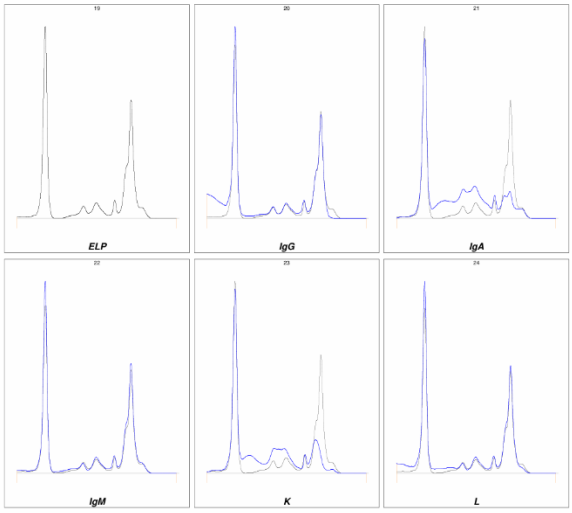
X-ray of the skull demonstrating multiple lytic lesions scattered across the cranial vault, consistent with the typical osteolytic bone involvement in multiple myeloma.

Figure 3



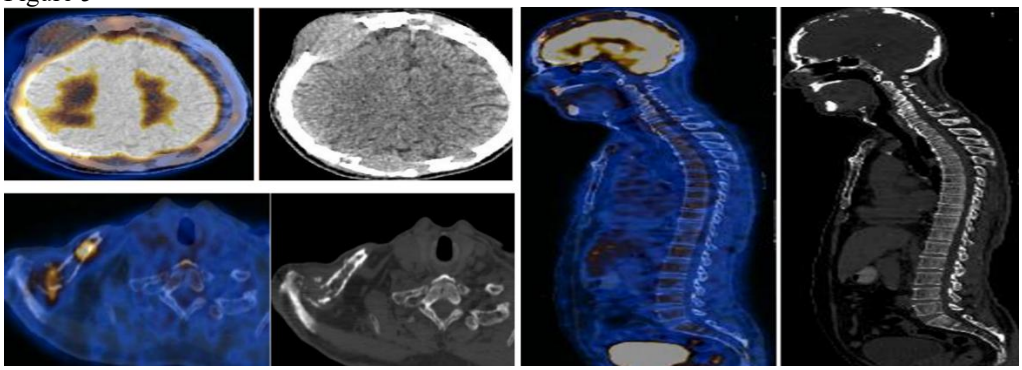
Computed tomography (CT) scan of the skull demonstrating multiple lytic lesions involving the calvarium. A prominent soft tissue component is noted, with the right frontal bone lesion showing both extradural and extracalvarial extension, consistent with extramedullary plasmacytoma in the setting of multiple myeloma.

Figure 4



Serum protein electrophoresis and immunofixation electrophoresis. The electrophoretic pattern demonstrates increased total protein with decreased gamma globulin fraction and a distinct monoclonal M band (1.8 g/dL) in the beta-2 globulin region. Immunofixation confirms monoclonal gammopathy of IgA kappa type with associated hypogammaglobulinemia, while immunoglobulin G (IgG), immunoglobulin M (IgM), and lambda light chain levels remain within normal limits.

Figure 5



Whole-body FDG PET-CT scan demonstrating diffuse osteoporosis and multifocal lytic lesions involving the axial and appendicular skeleton(calvarium, spine, mandible, sternum, bilateral clavicles and scapula, multiple bilateral ribs, sacrum, bilateral innominate bones, bilateral humerus and radius, femur and tibia). The lesions were predominantly FDG non-avid or only mildly metabolically active, consistent with multiple myeloma. Pathological fracture of the right clavicle is noted. A prominent soft tissue component associated with the right frontal bone lesion shows both extradural and extracalvarial extension. No other metabolically active disease was detected elsewhere in the body.