An Analysis of Solitary Sternal Plasmacytoma Cases and Clinical Outcomes with Multimodal Image Findings

Tarik Alfayyomi BS[1], Haaris Patel BS[2], Stephanie Lewis BS[3], Conor Kiely BS[4], Cooper Hathaway BS[5], Aamani Kalluru BS[6], Logan Lamar MS[7], John Hollis Tackett MS[8], Johnny Yang MS[9], Vani Vijayakumar MD[10]

UQ-Ochsner Clinical School; Department of Radiology, Ochsner Medical Center; University of Mississippi Medical Center

Introduction

Teaching Objective:

To include cases from our institution and review the literature of solitary sternal plasmacytoma cases, evaluate for correlation to multiple myeloma development, clinical correlations, and outcomes.

Solitary Plasmacytoma:

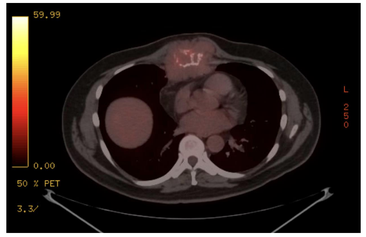
A solitary plasmacytoma of the bone (SPB) is rare and considered to exist along the spectrum of plasma cell dyscrasias with an increased risk of developing multiple myeloma (MM) when compared to monoclonal gammopathy of undetermined significance (MGUS). The rates of MM development are variable from time of diagnosis: 20-60% at 3-4 years, 85% at 10 years, and nearly 100% by 15 years. The median time of MM development is 2-4 years.

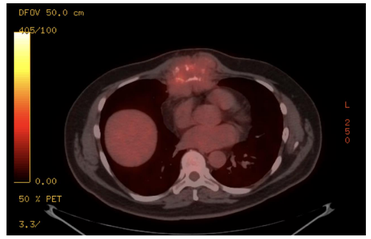
Methods

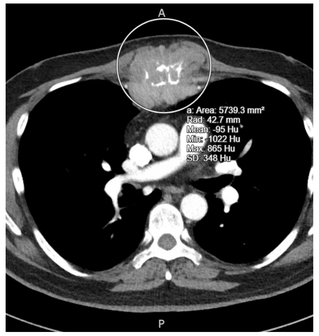
A literature review was performed using PubMed and MedLine to assess cases and studies of solitary sternal plasmacytoma (SSP). Phrases used in the search included “Solitary Sternal Plasmacytoma”, “Multiple Myeloma”, “Plasma Cell Dyscrasia”, “Solitary Bone Plasmacytoma”.

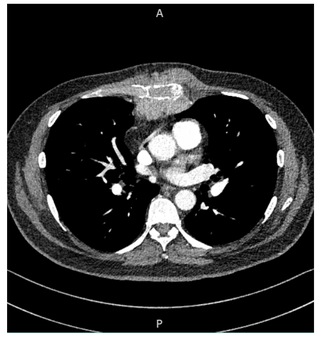
Results

SPB most often presented with minimal (<10%) or absent bone marrow involvement, however concurrence with MM has been noted in rare cases. On sternum XR and chest CT, the findings of plasmacytomas are typically consistent with osteolytic lesions with potential invasion of the cortex and adjacent soft tissues. In cases without signs of systemic disease, patient symptoms were primarily pain and discomfort related to direct invasion of bone structures and soft tissues. In patients with systemic disease, signs of end-organ damage were most common while subclinical cases with no systemic symptoms were rare.









Case Study: Patient Diagnosed with Solitary Sternal Plasmacytoma

55-year-old Hispanic male presenting with left sternal protrusion and discomfort for 4 months. Sternum XR and chest CT patient confirmed a 10.3 x 5.6 cm lobulated mass anterior to the sternum, subsequent biopsy confirmed a plasmacytoma of Kappa light chain restricted plasma cells.

Conclusions

SSPs are rare and often present with minimal or no symptoms but have a high rate of disease progression to MM. The development of MM in cases of SSP is quite high compared to other plasma cell dyscrasias. However, in cases of SSP the clinical prevalence of concurrent MM is poorly understood. Further evaluation of sternal plasmacytoma cases is necessary to better characterize this disease and its etiology.

References

1. Treglia G, Giovanella L, Muoio B, Caldarella C. Solitary Plasmacytoma of the Sternum Mimicking Bone Metastasis in a Patient with a History of Breast Cancer Evaluated by F-18-FDG PET/CT. Nuclear Medicine and Molecular Imaging 2014;48:169–70. https://doi.org/10.1007/s13139-013-0257-x.
2. Kaushik H, Manuja N, Devde KD, Dongre A. A Case Report of the Atypical Presentation of Multiple Myeloma Manifesting as a Sternal Mass. Cureus 2024;16:e65004. https://doi.org/10.7759/cureus.65004.
3. Bethel N, Asrar H, Dacosta J, Savopoulos A, Shaaban H. A Rare Case of Solitary Plasmacytoma Arising From the Sternum. Cureus 2022;14:e23819. https://doi.org/10.7759/cureus.23819.
4.]Zhang Y, Zhang C, Zhai H. Solitary Osteogenic Sternum Plasmacytoma on Bone Scintigraphy and FDG PET/CT. Clinical Nuclear Medicine 2017;42:865–7. https://doi.org/10.1097/rlu.0000000000001831.
5. ZHAO J, LI Y, WU W, ZHANG Z, DING Y. Solitary plasmacytoma of the sternum with a spiculated periosteal reaction: A case report. Oncology Letters 2015;9:191–4. https://doi.org/10.3892/ol.2014.2636.
6. Iqbal QUA, Majid HJ. Plasmacytoma. PubMed 2022. https://www.ncbi.nlm.nih.gov/books/NBK573076/.
7. Knowling MA, Harwood AR, Bergsagel DE. Comparison of extramedullary plasmacytomas with solitary and multiple plasma cell tumors of bone. Journal of Clinical Oncology 1983;1:255–62. https://doi.org/10.1200/jco.1983.1.4.255.
8. International Myeloma Working Group (IMWG) criteria for the diagnosis of multiple myeloma. International Myeloma Foundation n.d. https://www.myeloma.org/international-myeloma-working-group-imwg-criteria-diagnosis-multiple-myeloma.
9. Kyle RA, Durie BGM, Rajkumar SV, Landgren O, Blade J, Merlini G, et al. Monoclonal gammopathy of undetermined significance (MGUS) and smoldering (asymptomatic) multiple myeloma: IMWG consensus perspectives risk factors for progression and guidelines for monitoring and management. Leukemia 2010;24:1121–7. https://doi.org/10.1038/leu.2010.60.

Author Contact Information

Vani Vijayakumar MD: vani.vijayakumar@ochsner.org
Tarik Alfayyomi: v-talfayyomi@ochsner.org