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Case Report

Apical lung mass—A rare presentation of multiple myeloma☆

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ABSTRACT

Multiple myeloma is a neoplastic proliferation of immunoglobulin-producing plasma cells with clinical features resulting from infiltration of plasma cells into bones and other organs. Multiple myeloma manifesting as an apical lung mass is less common and very few cases have been reported. We report the case of a 50-year-old female who presented with an apical lung mass which happened to be multiple myeloma arising from the upper ribs into the lung. At the time of diagnosis, patient had axillary lymph node metastasis with extensive bony involvement. This case report and literature review provides insight to a rare but significant presentation of multiple myeloma and highlights the need to consider multiple myeloma as a possible differential for Pancoast tumor in the appropriate clinical setting as this could potentially affect management options and patient outcome.

Introduction

Most apical lung mass originate from pulmonary tissues with very few stemming from extrapulmonary sources. Differentials for apical lung mass arising from extrapulmonary sources include hyoid bone, larynx, thyroid gland, subclavian vessels and less commonly, multiple myeloma. Multiple myeloma manifesting as an apical lung tumor is less common and very few cases have been reported. This manifestation is typically associated with a more aggressive disease course and a poorer prognosis. Although uncommon, this case report reflects the need to consider multiple myeloma as a plausible differential for apical lung mass as early diagnosis has both treatment and prognostic implications.

Case description

Patient is a 50-year-old female with medical history of hypertension, hyperlipidemia, and substance abuse, who presented

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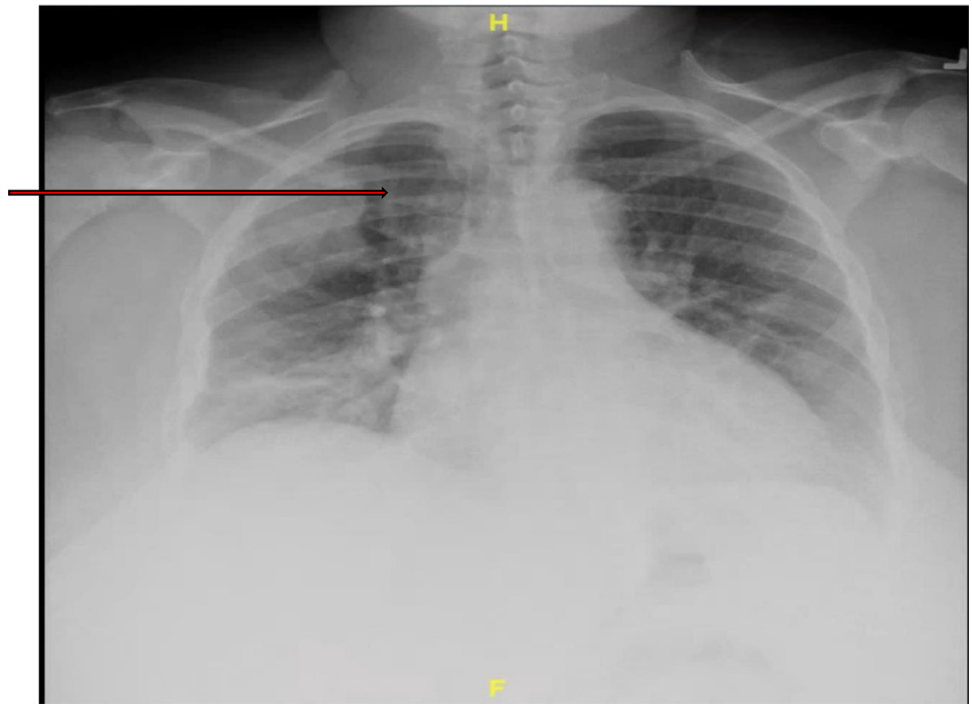

Fig. 1 – Chest X-ray with arrow showing mass-like opacity in the right upper lobe.

with complains of chest pain and discomfort of several weeks' duration. Family history was significant for lung cancer in the patient's father. Vitals were normal and physical examination was unremarkable. complete blood count (CBC) done showed anemia with a hemoglobin of (9 g/dl) and RDW of 19.2%, leucopenia (WBC- 4.1 Ref 4.8-10.8 k/ul), Hemoglobin A2 of 1.6 (Ref value 2.2%-3.2%), total calcium was normal (9.8- Ref value 8.5-10.5 mg/dl), normal albumin (4.4 Ref value 3.2-4.8 g/dl), with increased total protein (9.2 Ref value- 6.0-8.5 g/dl) and LDH (263 Ref value- 100-190 units/l). Kidney functions were normal. CT scan of the chest, abdomen, and pelvis done showed pleural based mass eroding the right second rib, 6 local metastatic lymph nodes (LN) outside right rib cage, lytic skeletal metastasis on right scapula, eighth, ninth ribs, iliac bones, left ischium, sacrum, coccyx, throughout thoracic and lumbar vertebra. The patient was being evaluated for Pancoast tumor of the right lung for which she had LN biopsy of the right axillary lymph node showing core fragments of sheets of monotypic (kappa) plasma cells, consistent with plasma cell neoplasm. Patient was scheduled for biopsy of the lung mass but was lost to follow up.

A month later, she presented with left upper thigh pain for 2 weeks duration and right shoulder pain of 2 days duration worsened by movement with no known relieving factor. There was no history of weakness or numbness and no preceding trauma or injury. Chest X-ray done showed right upper lobe mass-like opacity (Fig. 1). X-ray of the right shoulder done showed lytic, permeative lesion within the proximal and mid humeral diaphysis with pathologic compression fracture proximally and opacities within the right lung base and lateral right upper lobe (Fig. 2). X-ray of the right elbow also showed lytic lesions in the distal humeral diaphysis (Fig. 3). Chest CT done showed extensive diffuse lytic lesions throughout the visualized osseous structures compatible with history of multiple myeloma with multiple pathologic fracture involving multiple right ribs, proximal right humerus, T4 and T5vertebral bodies and a 5.5 cm pleural-based mass (Figs. 4A and B) in the right upper lobe eroding adjacent second rib with right axillary lymphadenopathy. CT abdomen and pelvis showed large destructive lesion in the left ilium with multiple lytic lesions seen throughout the pelvis and spine as well as within several right-sided ribs. Bone marrow biopsy done showed morphologic and immunophenotypic findings consistent with multiple myeloma (Fig. 5). Patient was diagnosed with multiple myeloma and was commenced on chemotherapy cycle with high dose dexamethasone, cyclophosphamide and Bortezomib.

Discussion

Multiple myeloma is a relatively rare cancer accounting for about 1.8% of all new cancers in the United States [1]. It is a malignant neoplasm of plasma cells accumulating in bone marrow leading to medullary failure, bone destruction, and extramedullary manifestations [2]. In 2021, there was about 35,000 estimated new case and about 13, 000 deaths making up about 2% of all cancer deaths. Five-year survival has been estimated to be about 56%. About 0.8% of men and women will be diagnosed at some point during their lifetime, with men being more affected than women [1]. Most clinical presentation of the disease are related to infiltration of plasma cells into bones and sometimes other organs. Extramedullary plasma-

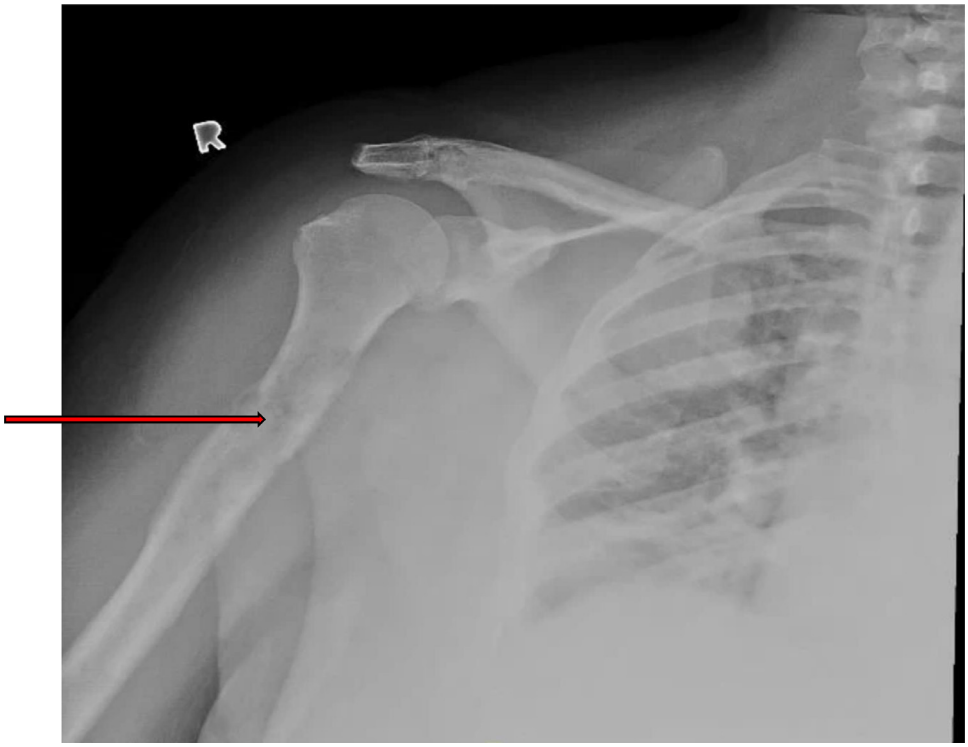

Fig. 2 – Right shoulder X-ray with arrow showing lytic bone lesions within the humeral diaphysis.

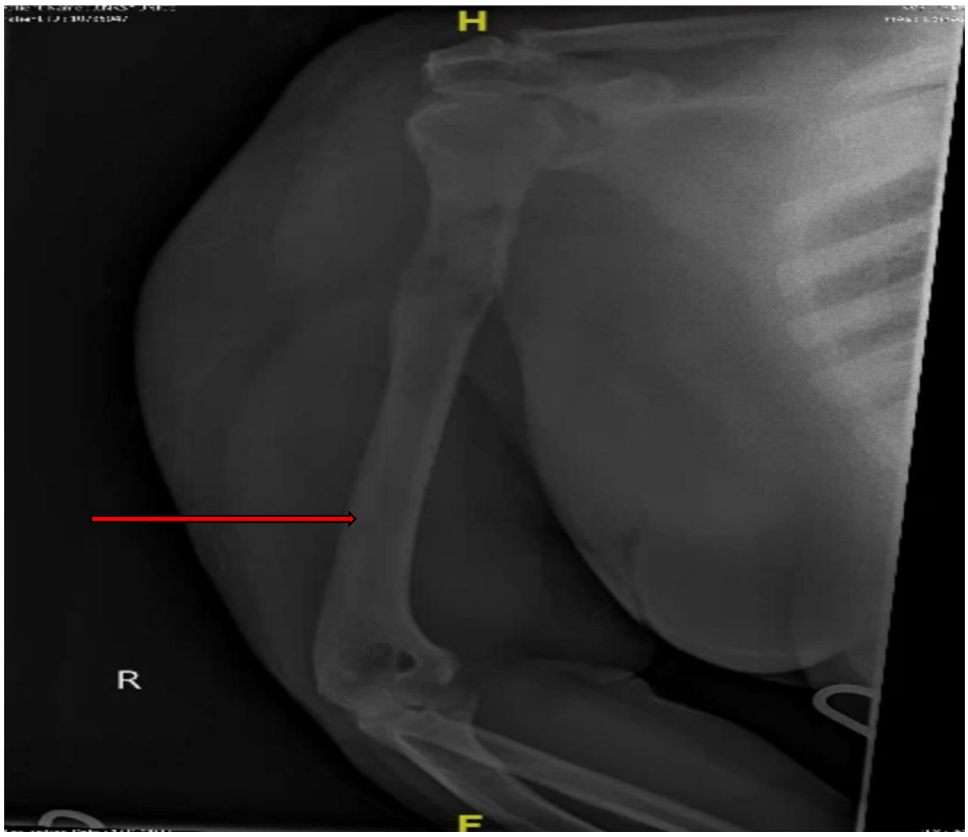

Fig. 3 – X-ray of the right elbow with arrow showing lytic lesions in the distal humeral diaphysis.

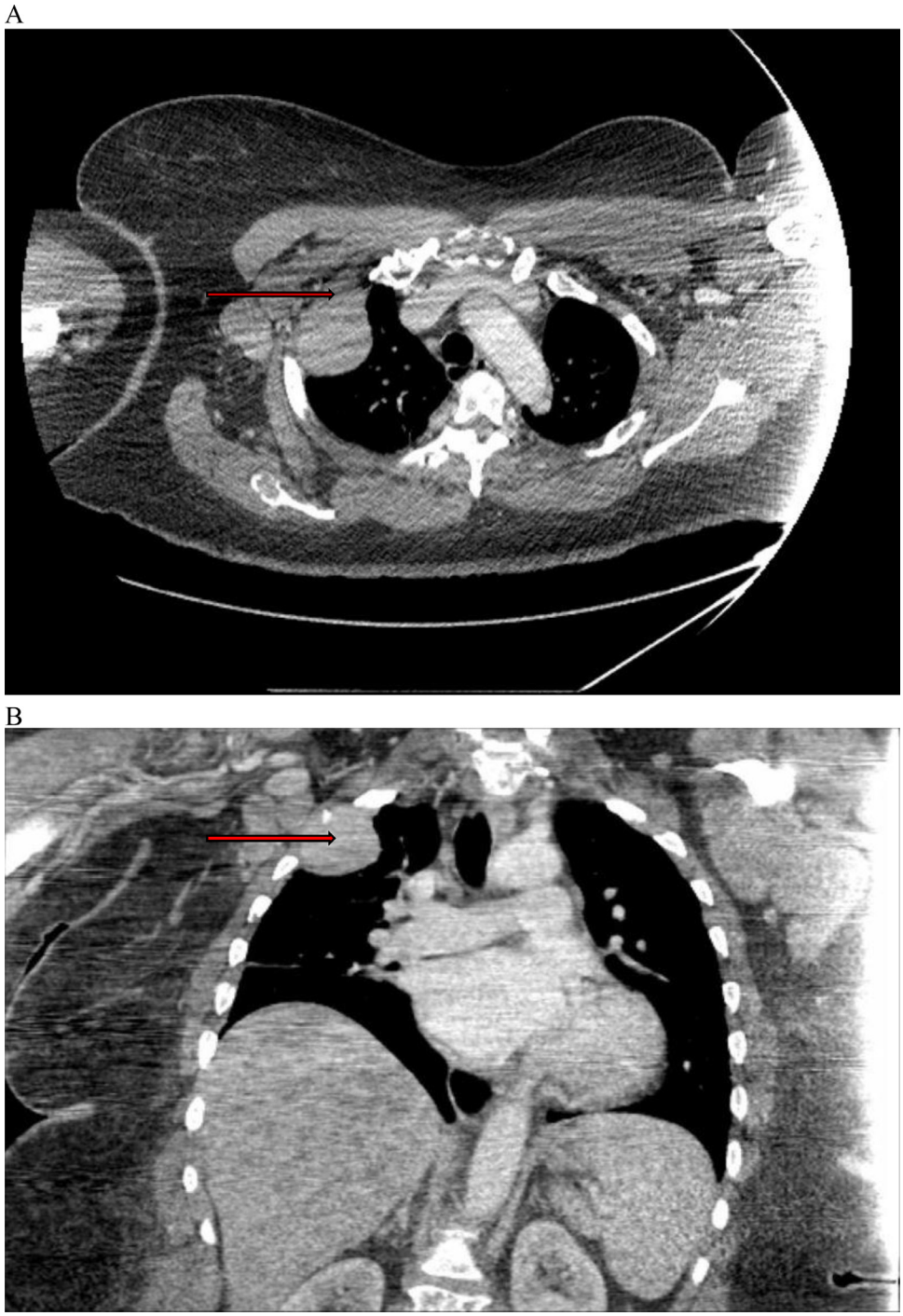

Fig. 4 – (A and B) Sections of CT chest with contrast showing apical lung mass (arrows)- second CT scan.

cytomas account for <5% of multiple myeloma manifestations [3]. This manifestation is associated with more aggressive disease with decreased survival [4]. M Varretoni et al. observed a shorter overall (HR 3.26, $P < .0001$) and progression-free (HR 1.46, $P = .04$) survival [5] in those with extramedullary manifestations. Also, they have been associated with increasing incidence of relapse despite advances in treatment including the use of high-dose therapy and biological agents [6].Very few cases of lung involvement have been described [7] with fewer cases, manifesting as Pancoast tumors [8;9].

According to the International Myeloma Working Group (IMWG) (Rajkumar SV, 2014), diagnosing MM has been updated to include biomarkers (SLiM- greater than or equal to 60% clonal plasma cells in the bone marrow, Light chain ratio of 100 or more, MRI with more than one focal marrow lesion) and CRAB features (hypercalcemia >11.5 mg/dl, renal insufficiency Creatinine >2 mg/dl or Creatinine clearance <40 mL/min, anemia Hb <10 g/dl or 2 g/dl less than normal and presence of bone lesions), both referred to as SliM-CRAB [10]. Treatment options include primary therapy (includ-

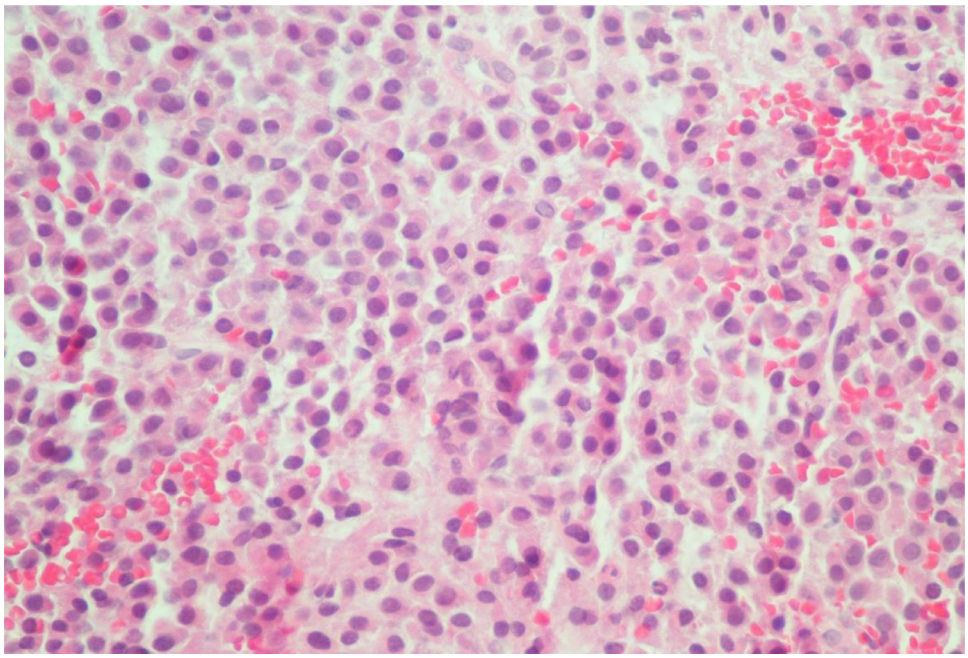

Fig. 5 – Patient's bone marrow biopsy showing multiple plasma cells consistent with multiple myeloma.

ing Bortezomib, Lenalidomide, Dexamethasone), high-dose chemotherapy and hematopoietic cell transplant in transplant eligible patients and supportive care.

Our patient presented with an apical lung mass, a unique manifestation of multiple myeloma which was initially evaluated as a Pancoast tumor with extensive bony involvement. Further workup with axillary lymph node biopsy showed features consistent with plasma cell neoplasm. Although lung mass could not be biopsied as patient was lost to follow-up, further review showed that the mass was in fact originating from the apical ribs in the setting of MM. Having a high index of suspicion was crucial in making this diagnosis as early diagnosis was critical in determining patient's management options and prognosis.

Conclusion

Multiple myeloma manifests as a malignant neoplasm of plasma cells resulting in marrow invasion and bone destruction. In our case report, it presented as an apical lung mass extending from the upper rib. This unique presentation could potentially pose a diagnostic dilemma leading to delays in diagnosis and consequently, poorer outcome [11]. This underscores the need to have a high index of suspicion for early diagnosis and prompt treatment.

Patient consent

This is to verify that appropriate informed consent was obtained from the patient for this report.

REFERENCES

[1] SEER. (2022, June). Cancer Stat Facts: Myeloma. Retrieved from seer.cancer.gov: https:seer.cancer.gov/statfacts/html/mulmy.html.

[2] NCCN Guidelines Version 5.2022Multiple Myeloma. NCCN 2022;5:MS-2–MS-3.

[3] Patlas M H-HI. Imaging findings of extraosseous multiple myeloma. Cancer Imaging 2002;2(2):120–2. doi:10.1102/1470-7330.2002.0017.

[4] Innes J NJ. Myelomatosis. Lancet 1961;1(7171):239–45.

[5] M Varettoni AC, et al. Incidence, presenting features and outcome of extramedullary disease in multiple myeloma: a longitudinal study on 1003 consecutive patients. Ann Oncol 2010;21(2):325–30.

[6] Raanani P SO-B. EM disease and targeted therapies for haematological malignancies—is the association real? Ann Oncol 2007;18:7–12.

[7] Moulopoulos LA GC. Extraosseous multiple myeloma: imaging features. Am J Roentgenol 1993;161(5):1083–7.

[8] Brenner Benjamin, Carter A, Freidin N, Malberger E, Tatarsky I. Pancoast's syndrome in multiple myeloma. Acta Haematol. 1984;71(5):353–5. doi:10.1159/000206615.

[9] Vijaya Sivalingam Ramalingam NG. Multiple myeloma with extramedullary dissemination to lung: a rare cause of Pancoast syndrome. Am J Respir Crit Care Med 2012;185:A4396.

[10] Rajkumar SV, Dimopoulos MA, Palumbo A, Blade J, Merlini G, et al. International Myeloma Working Group updated criteria for the diagnosis of multiple myeloma. Lancet Oncol 2014;15(12):e538-48. doi:10.1016/S1470-2045(14)70442-5.

[11] Cho RM. Extraosseous multiple myeloma: imaging spectrum in the abdomen and pelvis. Abdom Radiol 2021;46:1194–209. doi:10.1007/s00261-020-02712-2.