

RADIOLOGICAL PRESENTATION OF BELOW KNEE OSSEOUS METASTASIS: A RARE CASE REPORT

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ABSTRACT

Breast cancer most commonly metastasize to bones around 58% and axial skeleton is the most favorable location of bone metastasis that is 85 % cases. In Appendicular skeleton (humerus and femur) are most commonly affected bones, however, tibia involvement is extremely rare. We report a case of breast cancer patient who developed osseous metastasis in left tibia.

Keywords: Tibia, bone metastasis, breast cancer, MRI

Introduction

Malignant tumors spreading to appendicular skeleton is lung (most common), breast, renal and prostate. It is estimated that only 0.1% cases metastasize distal to knee and elbow.¹ Initial radiograph is always reviewed carefully and in case of constant pain not relieved by conservative management / unhealed fracture narrows down the differential towards tumor. Metastatic tumors due to the weight bearing potential, below the knee metastasis impact patient function and mobility significantly.² As a result of cortical and trabecular destruction, bone metastasis in tibia and fibula can cause pathological fractures, severely impacting the quality of life. Orthopedic surgeon/ oncologist discovers these lesions in advanced stages, at this stage their main purpose is to reduce pain, and improve quality of life.³

A search through the literature showed very few cases reported on breast cancer metastasis below the knee. To the best of our knowledge this is the first case report on unilateral osseous metastasis in breast cancer patient in Pakistan.⁴

Case Presentation

An 80-year old female patient presented to radiology department of Jinnah post graduate medical center for the purpose of contrast enhanced MRI leg with presenting complaint of localized left leg pain and difficulty in walking. On further inquiry patient was found out to be biopsy proven case of breast carcinoma. Initial workup included X-ray both lower limbs which showed a minimally displaced transverse fracture involving mid shaft of left tibia and degenerative changes for which she was conservatively managed but the pain did not subside, for further confirmation of the diagnosis MRI leg with contrast was done which revealed multiple abnormal signal intensity areas involving whole of left tibia. These lesions appeared hypo intense on T1w images, hyper intense on T2w and STIR images showing post contrast enhancement. These were associated with surrounding bone and soft tissue edema with periosteal reaction. Right leg appeared unremarkable on MRI as well. Later, bone scan confirmed that the lesions were metastatic deposits of the known primary. The unilateral involvement of tibia and distal knee

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(appendicular bone) metastasis makes it unique in its presentation as it is a rare site of skeletal metastasis.



Figure 1: Frontal radiograph left leg shows plaster cast placed around left leg with reduced bone density and multiple lytic lesions involving whole tibial diaphysis. A non-displaced fracture is noted in mid shaft of tibia.



Figure 2a&b: coronal T1W and T2W images of bilateral legs. Multiple round lesions in left tibia diaphysis, hypointense on T1W images and hyperintense on T2w images.

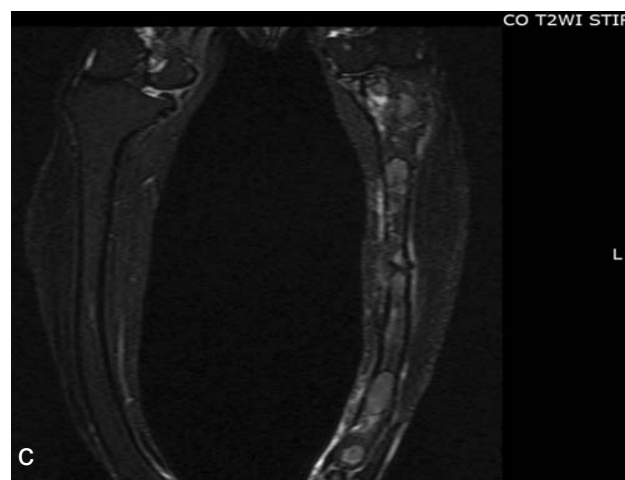


Figure 2c&d: Coronal T2w STIR sequence and coronal T1w post contrast fat sat. Soft tissue edema is clearly visible on T2w STIR images in left leg. lesions show enhancement on Post contrast images.

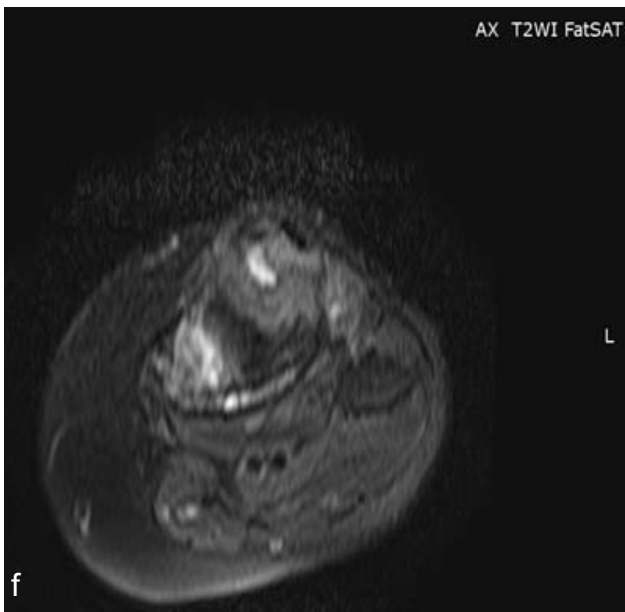
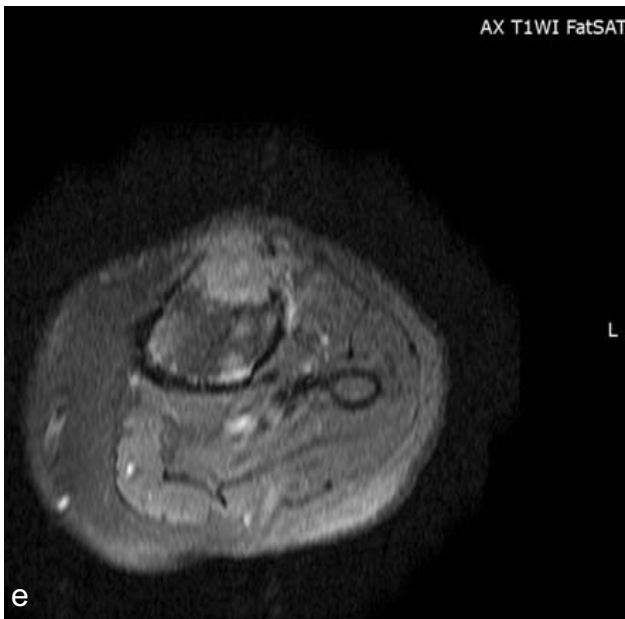


Figure 2e&f: Axial sections of T1w and T2w with fat sat images shows that the lesions encase the adjacent neurovascular bundles.

Discussion

It is important factor that unlike primary bone tumors, metastasis show limited periosteal reaction in exception to prostate cancer metastasis.⁵ Plain radiograph plays a limited role as extensive bone loss is required before density loss is visible radiologically. CT plays a pivotal role in determining the extent of

bone involvement and assessing pathological fracture. MRI is sensitive to the replacement of normal bone marrow, however bone scan is considered most sensitive for assessment of both lytic and sclerotic metastasis. On T1, STIR and diffusion weighted images osteolytic bone metastasis can be easily identified due to increased water content. MRI also reliably distinguish between osteoblastic and osteolytic bone metastasis. It also plays a crucial role in assessment of complications.⁶

Differential diagnosis of unilateral osseous metastasis includes multiple myeloma, osteomyelitis, tumors, trauma and osteonecrosis.⁷

There is increased risk of pathological fracture in osteolytic metastasis. Below knee metastasis impact patient's quality of life which is concerning for palliative cancer patients giving limited prognosis.⁸ These lesions can be treated with radiotherapy, surgery, hormonal therapy, bisphosphonates and calcium. Management should be multidisciplinary. Surgery is considered according to patient's age and comorbidities. However, in senile patients, palliative radiotherapy is the best option and relieves pain in majority of cases.^{9,10}

It is important to document the different radiological presentations of unusual clinical cases in order to provide optimal management for future patients.

Conclusion

Secondary tumors affecting tibia are uncommon but in intractable lower extremity pain predominantly in patients having history of malignancy or those who lack age appropriate cancer screening, it is an important diagnosis to consider.

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