



Ewing Sarcoma of the Femoral Diaphysis with Skip Metastases

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Image Article

The most frequent bone sarcomas in children are osteosarcoma and Ewing sarcoma. Their clinical appearance varies greatly based on the patient's age and tumor location [1].

The age of presentation varies greatly, although the average age is 14-15 years. Gender distribution is equal. Ewing sarcoma is classified as an undifferentiated small round cell sarcoma of bone and soft tissue in the most recent WHO classification [2].

The clinical presentation differs according to the tumor's location. Symptoms such as pain, mass, or edema are frequently present for months before the diagnosis [2].

Due to its sensitivity to identify bone matrix, radiography is crucial for the early evaluation and diagnosis of bone malignancies.

The "sunburst periosteal reaction," "onion skin periosteal reaction," "Codman triangle," and "permeative pattern" are traditional radiographic indicators of malignancy [1].

MRI is the method of choice for assessing these bone sarcomas, and

it serves a crucial role in both diagnosis and monitoring recurrence or tumor response [1].

The diaphysis of long bones is typically affected by Ewing sarcoma which manifests as a large bone tumor with ill-defined borders and a significant soft tissue mass. On T1-weighted images it exhibits low to moderate signal intensity while on T2-weighted images it shows heterogeneous high signal intensity. Typical restricted diffusion is seen within this tumor which correlates with low ADC values. Internal necrosis or bleeding which depending on its time of progression may seem hyper, iso (or) hypo-intense to muscle and often causes inhomogeneous contrast enhancement [2] (Figure 1).

It can be invasive locally, invading nearby structures [2].

References

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Figure 1: MRI of pelvis and femoral bones: **A+ E:** coronal and axial T1 weighted sequence, **B+ F:** coronal and axial T2 fat sat weighted sequence, **C:** coronal T2 Fat sat weighted sequence of the left femur, **D+ G:** Coronal and axial DCE-MR weighted sequence: heterogeneous mass centered in the diaphysis of the left femur, that contains foci of internal necrosis, With surrounding important soft tissue proliferation and permeative cortical damage.

Axial DCE-MR images (D+G) shows peripheral enhancement of the tumor and no enhancement of the central part of the tumor (necrosis). The primary tumor are associated with "skip metastases" of the distal metaphysis presenting as nodular signal abnormalities with the same characteristic as the primary tumor.

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