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Editorial

Misdiagnosis of Pathological Fractures in the Elderly Population: A Critical Clinical Problem with Oncological Implications

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To the Editor,

Differentiating osteoporotic fragility fractures from malignancy-related pathological fractures in older adults is a clinically significant challenge, particularly when these patients first present to general orthopedic and trauma services. Although osteoporosis accounts for a large proportion of fractures in this age group, misinterpreting atypical or progressive lesions as simple osteoporotic fractures carries real risk: it may delay cancer staging, systemic therapy, and appropriate orthopedic oncologic planning. Bone fragility in older adults is multifactorial, arising from age-related bone loss, reduced mobility, and accumulated comorbidity (1). In practice, a diagnostic grey zone emerges because osteoporotic and malignant fractures can share clinical features—pain, impaired mobility, and skeletal-related events such as pathological fracture or spinal cord compression—as well as non-specific plain radiographic appearances in the spine and pelvis, predisposing clinicians to premature diagnostic closure. Recent literature emphasizes that plain radiography alone is insufficient to distinguish metastatic bone disease, and that MRI is the most sensitive modality for separating osteoporotic from malignant vertebral or metastatic lesions, as it permits detailed assessment of bone marrow infiltration and associated soft-tissue involvement (2). While advances in fracture-risk assessment tools for metastatic long-bone lesions may enable earlier intervention to preserve function and improve outcomes, diagnostic misclassification between osteoporotic and malignant pathological fractures continues to occur, with several consequences. First, it can delay referral to oncology or orthopedic oncology services, and in turn delay biopsy and treatment decisions. Second, it may lead to suboptimal surgical planning—for example, fixation that is not tumor-aware or that fails to account for adjuvant radiotherapy or systemic therapy. Third, it can increase complications, re-operations, and healthcare utilization, with effects extending well beyond the acute fracture episode (3).

A key contributor to this problem lies not in the absence of diagnostic knowledge but in gaps within real-world diagnostic pathways. In many settings, older patients with suspected pathological fractures are initially assessed in general orthopedic or trauma services rather than specialized oncologic centers (4). Given the high prevalence of both an aging population and osteoporosis, clinicians may default to the more common explanation and anchor early on an osteoporotic diagnosis rather than a pathological one—particularly when initial radiographs appear non-specific. The demographic overlap between osteoporosis and cancer compounds the difficulty: improving cancer survival means that more older adults live with metastatic disease while also carrying age-related bone fragility. Fractures in this group may therefore reflect dual pathology rather than a single cause, and without timely multidisciplinary input, definitive diagnosis and treatment may be delayed. To close this gap, greater emphasis is needed on systematic assessment strategies and on closer collaboration among orthopedic surgeons, radiologists, and oncologists, ensuring that malignancy is actively considered when evaluating fractures in older adults. Pragmatic, standardized red-flag screening—incorporating frailty status and cancer history—should be promoted through journals and orthopedic and oncology societies (4). Where red flags are present, timely MRI or CT should be obtained, and where results remain inconclusive, biopsy and multidisciplinary discussion should be considered (2, 5).

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