

Union rate of pathologic fractures sustained in patients with metastatic bone disease

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INTRODUCTION:

Metastatic bone disease (MBD) causes significant morbidity, pain, and inferior quality of life. Treatment focuses on improving skeletal stability, with the aim to provide a durable orthopedic solution for a patient's remaining life. Historically, union rates for pathologic fractures were influenced by histology type, with some cancers exhibiting dismal healing rates. Given advances in tumor profiling and adjuvant therapies, a more contemporary review of bone healing is warranted and may improve expectations, decision making, and management recommendations.

METHODS:

An IRB approved retrospective review from 2014 to 2024 was conducted at an NCI-designated cancer center. Inclusion criteria included patients ≥ 18 years of age with MBD that either underwent prophylactic fixation (PF) or internal fixation (IF). Patients with primary bone malignancies, spinal metastases, and/or treated with endoprosthesis were excluded. The primary outcome was histology-specific bone healing rates, determined by radiographs reviewed by fellowship-trained musculoskeletal radiologists. Additional data such as overall survival, treatment, and fixation type were also assessed.

RESULTS:

A total of 169 patients who underwent fixation for either an impending or pathologic fracture were included for analysis. Of these patients, 67 were impending fractures and 102 were pathologic fractures. Average age of the patient cohort was 64 years with 55.4% being female. Results demonstrate a healing rate of 82%, 89%, and 96% of lung cancer, breast cancer and multiple myeloma respectively at 6 months. Additionally, our study demonstrates an improved survival for patients with lung cancer who sustained a pathologic fracture compared to previous studies, in which no patients lived beyond 6 months.

DISCUSSION AND CONCLUSION:

Our study suggests union rates have substantially improved from historic values. It appears there is near universal healing in multiple myeloma and meaningful potential for bony healing in all other histologies. More accurate prognostication in the setting of molecular profiling, targets, treatments, and immunotherapy, will allow surgeons to make more informed and accurate recommendations while guiding and treating patients living with metastatic cancer.