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Prevalence of Primary Carcinoma, Rates of Pathologic Fracture, and Mortality in the Setting of Metastatic Bone Disease

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Introduction: Bone is a common site of metastatic disease for a variety of primary tumors. However, the prevalence of these primary tumors in the setting of metastatic bone disease is ill-defined in the oncologic literature. Therefore, the purpose of this study is to identify the prevalence of these primary tumors in the setting of metastatic bone disease and identify rates of pathologic fracture as well as 90-day mortality following treatment of pathologic fracture for each primary tumor subtype.

Methods: The Premier Healthcare Database was queried to identify all patients who were diagnosed with a metastatic tumor to bone from 2015-2020. The prevalence of all primary tumor subtypes was tabulated and compared for the entire cohort. Rates of long bone pathologic fracture and 90-day mortality following treatment of pathologic fracture were then assessed within each primary tumor subtype.

Results: In total, 407,893 unique patients with metastatic bone disease were identified from 2015-2020. Of the 14 primary tumor subtypes assessed, metastatic bone disease was most frequently identified for lung (24.8%), prostatic (19.4%), breast (19.3%), gastrointestinal (9.4%), and urologic (6.5%) carcinomas. Rates of long bone pathologic fracture were highest for urologic (4.6%), female reproductive (3.2%), lymphoid (2.9%), endocrine (2.7%), breast (2.4%), and lung (2.8%) carcinomas. Ninety-day mortality rates following treatment of pathologic fracture of the long bones was highest for lung (12.1%), gastrointestinal (10.1%), central nervous system (10.5%), and skin (9.1%) carcinomas.

Discussion: Metastatic disease of the bone represents a heterogeneous group of diseases. It is important to understand the risk for pathologic fracture of the long bones and mortality following treatment of fracture based upon disease histology. These data should be considered when prognosticating patient outcomes during treatment of their metastatic bone disease.