Variation in Management of Metastatic Humeral Fractures

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Introduction and Objectives: Metastatic humeral fractures are treated by trauma surgeons, general orthopaedic surgeons, and orthopaedic oncology surgeons. Many factors (e.g. tumor type) are considered when deciding upon treatment. It is unclear how surgeon characteristics (e.g. subspecialty training, years in practice) and patient characteristics (e.g. tumor type, life expectancy) relate to the decision for specific treatment options. We aimed to evaluate: (1) if there was a difference between orthopaedic oncology surgeons and trauma surgeons in addressing metastatic humeral fractures, and (2) what patient characteristics guide the decision for treatment.

Methods: One hundred sixty surgeons participated in this cross-sectional survey study; 77 (48%) were orthopaedic oncology surgeons (Group A). The remainder (Group B) were predominantly trauma surgeons (46% [73/160]). All participants evaluated 24 fictional case scenarios of metastatic humeral fractures including radiographs. Scenarios varied with respect to: tumor type (breast carcinoma, renal cell carcinoma, and lung carcinoma), life expectancy (less than 3 months, more than 3 months), fracture type (pathological fracture, impending fracture), and anatomical location of the metastatic lesion (proximal humerus, diaphyseal humerus). Participants were subsequently asked for their treatment recommendation: intramedullary nailing, endoprosthetic reconstruction, plate-screw fixation, or nonoperative management.

Results: Among the 160 participants, 148 (93%) were men, and the mean years in practice was 15 (±9.2); most participants were from North America (49%) and Europe (38%). Intramedullary nailing was the most commonly recommended treatment (58%), followed by nonoperative management (22%), plate-screw fixation (14%), and endoprosthetic reconstruction (6.0%). We found a difference between orthopaedic oncology surgeons (Group A) and other subspecialties (Group B) in recommendation for specific treatments: intramedullary nailing was less often recommended by orthopaedic oncology surgeons (53%) compared to other subspecialties (62%) (p = 0.024); while endoprosthetic reconstruction (orthopaedic oncology surgeons: 8.7%, other subspecialties: 3.6%, p < 0.001) and plate-screw fixation (orthopaedic oncology surgeons: 20%, other subspecialties: 9.6%, p = 0.002) were more often recommended by orthopaedic oncology surgeons compared to other subspecialties; there was no difference in recommendation for nonoperative management between both groups (orthopaedic oncology surgeons: 19%, other subspecialties: 25%, p = 0.052). Recommendation for specific treatments varied based on tumor type, life expectancy, and location of the metastatic lesion. However, recommendation for treatment did not differ based on the type of fracture (impending versus pathological fracture).

Discussion/Conclusion: There is substantial variation in management of metastatic humeral lesions among surgeons. Our findings support the need for studies comparing different treatment options.

Keywords : humerus; metastatic disease; cancer; pathological fracture; variation

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