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CORR Insights®: Intramedullary Nailing of Femoral Diaphyseal Metastases: Is it Necessary to Protect the Femoral Neck?

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Where Are We Now?

More than 1.5 million patients are diagnosed with cancer annually in the US, and more than half a million die each year from metastases [2]. Bone metastases to the femur are common; in fact, the femur is the most common

site of osseous metastatic disease resulting in orthopaedic intervention. As such, most general orthopaedic surgeons are likely to encounter this problem. The goal in stabilizing these lesions is to allow the patient to regain mobility and maintain a high quality of life. Experience has shown fixation with intramedullary devices is superior to using plates and screws [3], although this may not apply for peri-prosthetic femoral bone metastases, where plate fixation may be the treatment of choice.

When choosing an intramedullary implant, the conventional wisdom has been to use locked cephalomedullary nails. Locking the nails makes sense because of the inherent instability of the femur when a metastatic lesion is present. The rationale for cephalomedullary nails instead of conventional nails is to prevent femoral neck fractures if a lesion were to develop in this

region during the remaining lifespan of the patient, but this theory is supported only by anecdotal evidence. The use of a cephalomedullary nail adds a degree of difficulty to the surgical procedure due to technical aspects of implanting screws in the femoral neck. The additional steps take more surgical time, and entail the use of more fluoroscopy with resultant radiation exposure to the patient, surgeon and staff.

Additionally, current high-quality imaging has greatly improved the detection of occult bone lesions, and occult femoral neck lesions seem unlikely to be missed with careful imaging. The use of bisphosphonates for patients with skeletal metastases also has substantially reduced the number of skeletal events requiring surgical intervention [4]. In addition, there is no evidence available to suggest that even if a metastatic bone lesion developed in the femoral neck, that a cephalomedullary nail would be sufficient to prevent a pathologic fracture or the need for surgical revision. Finally, patients with metastatic disease in general have a limited lifespan, with the majority dying in the

This CORR Insights® is a commentary on the article "Intramedullary Nailing of Femoral Diaphyseal Metastases: Is it Necessary to Protect the Femoral Neck?" by Moon and colleagues available at: DOI: [10.1007/s11999-014-4064-1](https://doi.org/10.1007/s11999-014-4064-1).

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This *CORR Insights*® comment refers to the article available at DOI: [10.1007/s11999-014-4064-1](https://doi.org/10.1007/s11999-014-4064-1).

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first year after diagnosis. In the current series, the median survival was nine months. This further decreases the risk of this patient population developing a new site of disease in the femoral neck after fixation.

Where Do We Need To Go?

In the current era, great emphasis is being placed on the value equation in health care (where value = quality/cost). Value is increased by improving quality and diminishing cost. One approach to optimizing value is to eliminate unnecessary procedures and other costs. The goal is to do what is right, safe, and efficient, and not to provide more care than is needed. Rethinking the quality equation requires challenging long held beliefs that are rooted in theory, not data. It is hard to change established practice patterns.

This paper, and other similar papers [1, 5], have questioned the theory that it is necessary to protect the femoral neck in the setting of diaphyseal femoral bone metastases. In the patient population studied by Moon et al, no patient developed a femoral neck lesion in the followup period. Alvi and Damron [1] also looked at the risks of protecting the entire bone in patients

with metastatic disease by using long intramedullary implants, including long stemmed endoprosthetics. They concluded that the incidence of disease progression was considerably lower than the complication rate potentially attributable to the use of these implants. Although 12% of patients in this series had progression of known and treated lesions, only one patient developed a new lesion in the treated bone that had not been previously recognized [1].

In patients with metastatic disease to the femur and without femoral neck or subtrochanteric involvement, it is not necessary to prophylactically stabilize the femoral neck. With modern imaging that can detect potential femoral neck lesions at risk, and bisphosphonates that prevent skeletal events, in my opinion the value equation favors not using cephalomedullary nails in this setting.

How Do We Get There?

If targeted cancer therapies and other advances result in longer patient survival in patients with metastatic disease to bone, then the idea that the femoral neck should be surgically supported may need to be readdressed. In the meantime, the evidence suggests

that conventional femoral nails are sufficient and will likely result in diminished operating time, radiation exposure, costs and other benefits over cephalomedullary nails in this setting. I applaud the authors for their contribution to improving the value equation in orthopedic surgical care.

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