Atypical Insufficiency Type Femoral Stress Fractures in Patient on Bisphosphonates

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An 86 year-old woman with history of inflammatory breast cancer and osteoporosis presented with progressive right leg weakness and discomfort. Her medication regimen included monthly Zometa (zoledronate) infusion. She was not on corticosteroids.

The patient underwent a right thigh MR imaging examination which demonstrated an incomplete mid femoral diaphyseal insufficiency-type stress fracture with lateral cortical thickening and triangular ridging (cortical beaking), incomplete transverse fracture line and associated periosteal and endosteal marrow edema (Figure 1). Six days later on her way to her orthopedic appointment her leg gave out and she fell from standing. Radiographs at that time (Figure 2) demonstrated a complete transverse lateral to oblique medial femoral diaphyseal fracture at the site of the insufficiency-type stress fracture. This was treated with intramedullary nailing. Radiographs of the left femur (Figure 3) were obtained two weeks later and demonstrated a focal area of lateral cortical thickening in the proximal femoral diaphysis suspicious for stress reaction. The patient subsequently underwent prophylactic nailing of the left femur.

Discussion

Osteoporotic fractures are typically low in energy and involve the wrist, proximal humerus or tibia, pelvis, and hip; they do not typically occur in the subtrochanteric or proximal femoral diaphyseal region as this area requires the application of considerable force to fracture. There have been several case reports describing patients who develop fractures of the subtrochanteric or diaphyseal region...
fractures is inadequate osteo-
clast activity which impairs bone remodeling and repair of normally occurring mi-
crodamage.1

It is important that phy-
icians have a high level of awareness of this entity. New onset thigh or hip pain in pa-
tients on long-term bispho-
phonate therapy should be investigated with radiographs of the femur. Typical imaging
features include focal cortical
thickening laterally and classi-
cally with a triangular ridge or beak configuration along the subtrochanteric or diaphyseal
region.3 Subsequently a dis-
crete cortical break may de-
velop. Some have advocated
for routine radiographs of the
contralateral femur to inves-
tigate for contralateral stress
reaction.1 In the setting of
heightened clinical suspicion,
more advanced imaging with
magnetic resonance imaging
or bone scintigraphy should
be considered. Prophylactic intramedu-
lary nailing should be strongly considered
as bone remodeling is impaired and pa-
tients have an increased risk of fracture
completion with low energy trauma.
More studies are necessary to determine
whether discontinuing bisphosphonates
and limited weight bearing is an accept-
able alternative treatment option in the
setting of stress reaction.

In summary, bisphosphonates have
clearly been demonstrated to decrease the risk of osteoporotic fractures. There is
now strong evidence that prolonged bis-
phosphonate therapy is associated with an
increased risk of atypical subtrochanteric
or femoral diaphyseal fracture although the absolute risk of these fractures is low.
High clinical awareness of this entity in
patients on long-term bisphosphonates
presenting with new onset thigh or hip
pain is warranted.

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in Patients on Long Term Alendronate Therapy.

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