

Risk factors for Atypical Femur Fractures in patients with and without bisphosphonate treatment

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Purpose

Up to 50% of AFF patients have never used BPs. We hypothesized that BP naïve AFF patients are more likely to exhibit factors predisposing to stress fracture, compared to patients with BP treatment.

Methods

From 2008–2010 in Sweden, 5694 patients aged 55+ had femur fractures. 172 met the ASBMR criteria for AFF, of which 134 had used BP before the fracture (BP), 38 had not (non-BP). Data on demographics, medication, comorbidities, and mortality were sourced from national registries. Geometric measures were measured using blinded evaluation of pre- or postoperative plain radiographs of the femur. Comparisons were made using regression models.

Results

The non-BP patients were younger and more likely to be men. They were less likely to use proton pump inhibitors, calcium, corticosteroids and have bone disorders. Radiographic assessment found a thicker lateral cortex in the non-BP group (lateral-to-medial cortical thickness ratio 0.996 versus 0.895, $p < 0.01$). 17% of non-BP patients and 24% of BP patients died during follow-up.

Conclusion

The findings suggest a potential difference in the pathophysiological mechanisms of stress fracture development between groups. The BP-exposed may experience insufficiency-type stress fractures due to BP treatment, while the non-BP group may develop fatigue-type fractures due to mechanical overload on healthy bone tissue.