

Assessment of ASBMR Major criteria for Atypical Femur Fractures in three large international cohorts

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Purpose

The ASBMR Task Force major criteria for atypical femur fractures (AFF) have been both praised and criticized. We aimed to assess if previously adjudicated AFF fulfill the radiographic stress fracture criteria and if there is a difference in how stress fracture criteria are used based on sex and treatment status with bisphosphonates (BP).

Methods

We used data from 663 patients with documented AFF from three different cohorts. All fractures were radiographically adjudicated by centralized external expert reviewers assuming a low-energy trauma mechanism. For assessment of AFF we used the existing ASBMR major criteria divided into:

- Fracture criteria: complete fracture with or without medial spike; minimal or no comminution
- Stress fracture criteria: transverse fracture line; focal cortical thickening

Results

A complete fracture with or without medial spike, minimal or no comminution, and a transverse fracture line was present in >97% of all patients in all three cohorts. Focal cortical thickening was present in 77% of all AFFs in Denmark, compared to 95% in Sweden and KPSC ($p < 0.001$). In patients without BP use, only 48% of AFF patients in Denmark had focal cortical thickening compared to 92% in Sweden and 88% in KPSC ($p < 0.001$). Fewer men compared to women showed focal cortical thickening ($p < 0.001$), see Figure.

Conclusion

Substantial differences exist in the application of radiographic ASBMR major criteria to AFF adjudication in three international AFF cohorts. Refinement of the ASBMR criteria to be more specific for stress fractures may facilitate a more consistent identification of AFFs.