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Mortality Risk Following Atypical Femoral Fracture: A Systematic Review And Meta-analysis

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Introduction: Proximal femoral fracture in elderly (>60 years of age) is known to be associated with a high one-year mortality risk of 21.2% (1). Studies have shown that the mortality rate of atypical femoral fracture (AFF) may be lower than that of typical proximal femoral fracture (2), although results from existing studies are inconsistent. Therefore, we aimed to summarize all available data, using systematic review and meta-analysis, to estimate the one-year mortality risk following AFF and risk ratio of mortality following AFF versus typical femoral fracture (TFF).

Methods: Potentially eligible studies were identified from Medline and EMBASE databases from inception to February 2022 using a search strategy that comprised keywords "Atypical Femoral Fracture" and "Mortality". Any eligible study must consist of a cohort of patients with AFF. Then, the study must report a one-year mortality risk following AFF or effect estimates with 95% confidence intervals (95% CIs) comparing mortality risks between

patients with AFF and TFF. Data were retrieved from each study and were combined using the generic inverse variance method. **Results:** A total of 8,967 articles were identified. After two rounds of independent review by three investigators, we identified 7 studies reporting one-year mortality risks of AFF and 3 studies comparing mortality risks of AFF versus TFF. These studies were included into the meta-analysis. The pooled one-year mortality risk following atypical femoral fracture of 0.10 (95% CI, 0.05 - 0.16; with high heterogeneity, I² 93.3%). The funnel plot was asymmetric in favor of studies that reported high one-year mortality risks. In the meta-analysis comparing the mortality risks following AFF versus TFF, no significant difference in mortality risks was found between the two conditions, with the pooled risk ratio of 0.98 (95% CI 0.78 - 1.25; with high heterogeneity, I² 96.8%). **Conclusion:** This systematic review and meta-analysis revealed that the one-year mortality risk following AFF was approximately 10%, which may be lower than the reported mortality risk after typical hip fracture of around 20% (1). However, no significant difference was found in the meta-analysis of studies that compared the mortality risks of the two conditions, suggesting the need for further investigation. The results will be useful for risk-benefit discussions on initiation of antiresorptive and anabolic osteoporotic therapy.

References 1. Schnell S, Friedman SM, Mendelson DA, Bingham KW, Kates SL. The 1-year mortality of patients treated in a hip fracture program for elders. *Geriatr Orthop Surg Rehabil.* 2010;1(1): 6-14. 2. Kharazmi M, Hallberg P, Schilcher J, Aspenberg P, Michaëlsson K. Mortality After Atypical Femoral Fractures: A Cohort Study. *Journal of Bone and Mineral Research.* 2016;31(3): 491-7

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