

Atypical Fractures: Best Practices in 2016

1. Epidemiology
 - a. Incidence Atypical Femur Fractures (AFFs)
 - b. Case reports of other sites (rare): pelvis, tibia, forearm
2. Definition
 - a. American Society for Bone & Mineral Research (ASBMR) Task Force 2013 Revised Case Definition of AFFs - Major Features (4/5 must be present) & Minor Features (none required)
3. Risk Factors for AFF
 - a. Chronic bisphosphonate use, Denosumab, female gender, asian ethnicity, early menopausal age
4. Denosumab vs. Bisphosphonates Mechanism of Action
 - a. Denosumab – targets RANKL vs. Bisphosphonates- Inhibit protein prenylation in the mevalonic acid pathway
5. Anatomical Variations as risk factors for AFF
 - a. Hip geometry (varus pre-fx neck-shaft angle, shorter hip-axis length, narrower center-edge angles); Femoral Bowing - large bow-diaphyseal, small bow-subtrochanteric
6. New Radiographic Findings
 - a. cortical thickness not a good radiographic marker for AFF
7. Pathogenesis – Effects of suppression on bone remodeling and its material properties
 - a. No difference in mean value of mineralization, crystallinity, or collagen maturity in those treated with bisphosphonates
8. Medical Management
 - a. Drug Holidays
 - i. American Association of Clinical Endocrinologists/USFDA/ASBMR
 - b. Short term dexamethasone
 - c. Newer Medical Therapies - Strontium Ranelate , Teriparatide, Denosumab
9. Imaging
 - a. XR, MRI, bone scan, DEXA
10. Management
 - a. Healing time and Complications in Operative Treated AFFs associated with Bisphosphonate use: A Multicenter Retrospective Cohort - Bogdan et al – J Orthop Trauma 2016;30:177-181
 - b. Periprosthetic AFFs (PAFF) in patients on Long-term BPs: A Multicenter Retrospective Review - Robinson et al- J Orthop Trauma 2016;30:170-176
11. Treatment Algorithm for AFFs
 - a. Current treatment algorithm proposed by Robinson et al- J Orthop Trauma 2016;30:170-176