Right thigh pain

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Diagnosis

Atypical femoral fracture (AFF). There is an incidental finding of a benign enchondroma in the intertrochanteric region.

Discussion

Bisphosphonates inhibit bone resorption by inducing apoptosis of osteoclasts, preventing deterioration of the bone microarchitecture and increasing overall bone density, and they reduce the risk of fractures [1]. In 2005, a case series of nine patients by Odvina et al. [2] suggested an association between AFFs and bisphosphonates. A later study by Abrahamsen [3] compared patients with and without bisphosphonate treatment, showing both groups having similar numbers of AFFs. Nevertheless, the Food and Drug Administration authority (FDA) issued a statement in 2010 advising that caution be taken when prescribing bisphosphonates (<http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/ucm203891.htm>). A causal relationship between

bisphosphonates and AFFs remains unclear; however, a recent Swedish publication in the New England Journal of Medicine of a retrospective radiographic analysis of patients on bisphosphonates concluded that chronic bisphosphonate administration is likely an important risk factor for AFF, and the current evidence base weakly supports long-term bisphosphonate use [4]. To date, the hypothesized pathogenesis of these fractures following chronic use of bisphosphonates is reduced bone turnover leading to microtrauma and, eventually, insufficiency fractures [5].

These fractures were first described as “atypical” by Lenart et al. in 2008 [5], as they tend to occur at the points of maximum weight-bearing stress of the femur: the subtrochanteric region and diaphysis. This terminology distinguished AFFs from “typical” osteoporotic fractures that commonly affect the femoral neck and intertrochanteric region. AFFs are incomplete initially and usually seen as an area of cortical beaking, possibly with a radiolucent line, at the lateral cortex of the subtrochanteric region on radiographs in patients with thigh or groin pain [5–8]. Findings may evolve into a complete subtrochanteric fracture. If radiographs are negative or equivocal, a bone scan, MRI or CT is a reasonable alternative. Additionally, imaging of the contralateral femur is warranted as these fractures may be bilateral [9].

The American Society of Bone and Mineral Research (ASBMR) set out major and minor criteria for describing AFFs. Major criteria include a proximal fracture line inferior to the lesser trochanter but proximal to the femoral condyles, no trauma or low-energy trauma, a transverse or oblique

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fracture line ($<30^\circ$), noncomminuted fracture, complete fracture crossing one cortex to the other, with or without a cortical beak, or incomplete fracture involving only the outer cortex [9]. Minor criteria include a lateral cortical periosteal reaction, increased cortical thickness, prodromal pain in the thigh or groin, bilateral fractures, delayed healing, comorbidities including rheumatoid arthritis, vitamin D deficiency or hypophosphatasia, and a drug history of bisphosphonates, steroids or proton pump inhibitors [9]. Exclusion criteria include femoral neck, intertrochanteric, periprosthetic or pathologic fractures.

Antiresorptive agents should be discontinued in patients with AFFs. Dietary calcium and vitamin D should be assessed and supplementation provided [9]. Asymptomatic patients should reduce their physical activity and use walking aids for protective weight bearing. A prophylactic intramedullary nail should be considered for patients failing 3 months of conservative treatment with moderate to severe pain and with incomplete fractures at risk of fracture displacement [7, 9]. Reduction and internal fixation are usually performed for complete fractures.

Conflict of interest No conflicts of interest.

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