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Management of bisphosphonate-related Incomplete Atypical Femoral Fracture – Lessons from its Natural History

Meng Ai Png

MD

Department of Diagnostic Radiology, Singapore General Hospital, Duke-NUS School of Medicine, Singapore

Other Contributors:

Joyce SB Koh

MD

Department of Orthopaedic Surgery, Singapore General Hospital, Duke-NUS School of Medicine, Singapore

P Chandra Mohan

MD

Department of Diagnostic Radiology, Singapore General Hospital, Duke-NUS School of Medicine, Singapore

Choong Yin Howe

Statistician

Tet Sen Howe

MD

Department of Orthopaedic Surgery, Singapore General Hospital, Duke-NUS School of Medicine, Singapore

Dear Sir,

We would like to comment on the article by Kyung-Jae Lee, MD, et al.: “Progression of Asymptomatic Contralateral Femur in Patients with Complete Atypical Femoral Fracture, According to Initial Radiographic Findings”.

We congratulate Lee et al for this timely article and share their concern on the natural history of incomplete atypical femoral fractures of the femur. Our research has shown that most of these femoral

stress fractures do not resolve and a significant proportion of them get worse with time.

We previously followed up 161 femoral stress fractures (76 patients, some with bilateral lesions and some with multiple lesions along the femoral shaft), the majority bisphosphonate-related, based on established radiological characteristics such as focal cortical thickening involving the lateral cortex of the femur and the dreaded black line (Png et al., 2019) and plotted their progression against a log based time scale (reference 1, Fig. 1). The lesions were classified using an ordinal scale from 0 to 8, based on the presence and site of the cortical thickening and the presence of an associated dreaded black line; those that progressed to complete fracture were given the highest score of 8. Most lesions either progressed (red line/thin black line) or remained static (amber line/thick dashed line), and only a handful regressed (green line/light grey thick dashed- dotted line).

Disruption of the natural history of incomplete atypical femoral fracture was not common unless bisphosphonate (BP) treatment is stopped. The majority of lesions with only focal cortical thickening (group B) remained stable compared to those with a dreaded black line (group C)(79.1% versus 45.7%). Conversely, a large proportion of group C lesions (40%) progressed. Discontinuation of BPs was associated with higher rates of lesion group stability (77.1% versus 52.5%), slower progression, healing of the dreaded black line, slower time to complete fracture (reference 1, Fig. 3d) and a lower complete fracture rate (10.9% versus 68.8%). Nevertheless, despite stopping BPs, 5 progressed to displaced fracture, 4 of which were group C lesions.

As alluded to by Anna Miller, MD and Marc Swiontkowski, MD, the data seen above and from several other studies (Koh et al., 2010, reference 2)(Min et al., 2016, reference 3), those with incomplete atypical femoral fractures, especially with less severe findings (group B), should immediately stop BP treatment, consider alternative osteoporotic therapy and commence long term surveillance. Patient education is paramount with emphasis on the importance of remaining off BPs, potential risk of progression to complete fracture and watchful waiting for back, hip and thigh symptoms, occasionally mistakenly attributed to hip/knee arthrosis and lumbar radiculopathy, which may herald progression of the incomplete fracture. For lesions with a dreaded black line, a closer follow-up interval is prudent and early fixation should be considered if symptoms develop, the lesion progresses or the dreaded black line persists.

Disclaimer: e-Letters represent the opinions of the individual authors and are not copy-edited or verified by JBJS.

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Conflict of Interest: None Declared