Reply to Letter to the Editor

The Effect of Long-term Alendronate Treatment on Cortical Thickness of the Proximal Femur

Aasis Unnanuntana MD, John P. Kleimeyer BA,
Kashif Ashfaq MD, Quang V. Ton MD,
Joseph M. Lane MD

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We thank Dr. Koh and colleagues for their well-taken comments to our article, “The Effect of Long-term Alendronate Treatment on Cortical Thickness of the Proximal Femur” [7]. Our results interestingly showed that the majority of patients treated with alendronate at a minimum of 5 years had stable or decreased cortical thickness. This finding is contradictory to the results from Lenart et al. [3]. Although the method used to calculate a cortical thickness ratio from dual energy x-ray absorptiometry images in our study is similar to that of the plain radiographs used by Lenart et al., a so-called normalized cortical thickness, some differences must be underscored between their study and ours regarding the methodology and patient population. First, Lenart et al. [3] reported the normalized cortical thickness in only patients with

subtrochanteric fractures, whereas we included only patients without a history of fractures around the lower extremities. Thus, our findings may not be applicable to those with atypical femoral insufficiency fractures. As we discussed in the original article [7], our study strongly supports the concept that patients with atypical femoral insufficiency fractures had thickened femoral cortices at the onset of bisphosphonate therapy. Second, we determined the cortical thickness ratio only at the subtrochanteric region, whereas Lenart et al. [3] measured femoral cortices just distal to the fracture site, which may not always be synonymous with the subtrochanteric area. Thus, the average value of the normalized cortical thickness from their study may differ from ours. Third, the mean ages of patients in their study were much older (70 and 83 years in patients with and without x-ray pattern for atypical femoral insufficiency fracture, respectively) than our patients (62 and 63 years in patients with and without history of long-term bisphosphonate therapy, respectively). It is possible that patients of different ages may respond to alendronate treatment differently. In addition, we do not have rigorous detail available regarding the adherence and compliance of patients with long-term bisphosphonate treatment in our study. However, the bone mineral density responses in our patients with long-term alendronate therapy were consistent with a compliant population based on previous reports [1, 5].

The majority of patients with atypical femoral insufficiency fractures have enlarged femoral cortices. In addition, they also have localized femoral thickening that may represent a true stress fracture [1–3]. We speculate that a stress fracture occurs at an area of abnormal stress concentration, such as at the lateral aspect of the femur attributable to anterolateral femoral bowing. As prolonged bisphosphonate therapy may lead to inhibition of the

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A. Unnanuntana (✉)
Department of Orthopaedic Surgery, Siriraj Hospital,
Mahidol University, 2 Prannok Road, Bangkoknoi
District, Bangkok 10700, Thailand
e-mail: uaasis@gmail.com; uaasis@yahoo.com

A. Unnanuntana, K. Ashfaq, J. M. Lane
Department of Orthopaedic Surgery, Hospital for Special
Surgery, New York, NY, USA

J. P. Kleimeyer
Weill Cornell Medical College, Cornell University,
New York, NY, USA

Q. V. Ton
Department of Internal Medicine, Englewood Hospital
and Medical Center, New York, NY, USA

fracture healing process and deposition of poor-quality bony tissue [4], these stress fractures can propagate to simple transverse or short oblique fractures with beaking. Nevertheless, we agree with Koh and colleagues that the American Society for Bone and Mineral Research criteria [6] to define atypical femoral insufficiency fractures needs further refinement. As we gain a greater understanding of the pathophysiology, we will be able to better define the critical elements of this unique disorder.

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