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A hardy infestation: post-traumatic osteomyelitis mimicking heterotopic ossification

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Dear Sir,

Post-traumatic osteomyelitis occurring as a complication of fracture fixation may appear as heterotopic ossification (HO) to the untrained eye.

Herein, we present the case of a 55-year-old Malay woman with a previous open right comminuted midshaft femur fracture in December 2010 fixed with a 14-hole proximal femur locking plate (Fig. 1), which had been complicated by an infected right hip hematoma requiring surgical debridement and long-term intravenous antibiotics. The patient now presented with right hip pain for five days that was associated with fever, nine years after her index injury. Physical examination was unremarkable, with a mildly limited range of motion of the right hip, and tenderness only on palpation of the greater trochanter. The erythrocyte sedimentation rate was 105 mm/hour, C-reactive protein was 187.6 mg/L, and total white blood cell count was 13.1×10^9/L. Baseline inflammatory markers were known to be raised on presentation to various other specialties but were deemed to be reactive in view of a minimally symptomatic right hip and frequent healthcare visits for pain in the left foot, which was attributed to gout. Radiographs of the right hip and pelvis showed significant peri-implant new bone formation along the femur, superficial to the implant (Fig. 2). The differential diagnoses included HO versus osteomyelitis. Ultrasonography of the right hip revealed a superficial collection measuring 13.4 cm × 1.5 cm, with internal echoes spanning the superficial lateral thigh.

Subsequently, the patient underwent right hip wound debridement and removal of implants. The plate was covered with a thick layer of involucrum, which was removed *en masse*. Pus pockets were found, but the femur was well united. The wound was closed after plate removal and meticulous debridement. Intraoperative cultures of the soft tissue grew methicillin-resistant *Staphylococcus aureus* (MRSA), as was cultured during her index post-surgical infection, while cultures of the involucrum grew scanty amounts of both MRSA and

pan-sensitive *Salmonella enteritidis*. The patient was administered culture-directed intravenous antibiotics on an outpatient basis for six weeks.

Late post-traumatic osteomyelitis, which is defined as onset of osteomyelitis more than ten weeks after implantation,[1] is often due to haematogenous seeding or recurrence of an insufficiently treated early infection. The signs, symptoms and inflammatory markers are milder in these cases. This is an uncommon condition; one study reported an incidence of 16.4% at less than six weeks post-fixation and implantation *in situ*.[2] Implant removal could cause severely delayed presentations, up to 17 years.[3] The current case of late post-traumatic chronic osteomyelitis with implant *in situ*, which presented after a dormancy of nine years, was likely due to recurrence of the index infected hematoma that remained indolent despite being in clinical remission at our initial one-year review. Coinfection by *S. enteritidis* was likely attributable to a recent hematogenous infection from the gut and may explain the acute history despite a chronic infective process by MRSA.

HO is a disorder of ectopic bone formation in soft tissue,[4] which is most prevalent at the hip. Similar symptoms of HO and post-traumatic osteomyelitis may render their differential diagnosis difficult. The earliest radiographic signs of hip HO are a circumferential ossification with a lucent centre in the soft tissue surrounding the greater trochanter. Progression involves bony ankylosis spanning the femur to the pelvis. The relative lucency and haphazard organisation of an HO should be differentiated from the dense radio-opacity of an involucrum[5] that is well-contoured to the inciting plate. Importantly, the history of a previous implant-related infection should prompt a thorough workup for a recurrent infection despite a severely delayed presentation.

Yours sincerely,

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FIGURES

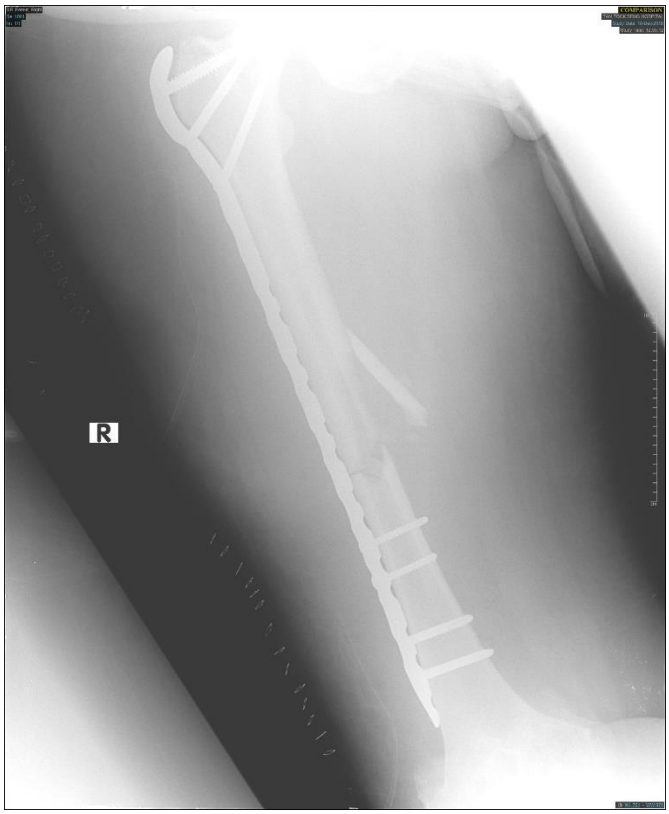

Fig. 1 Anteroposterior radiograph shows the right femur after index right femur bridge plating.

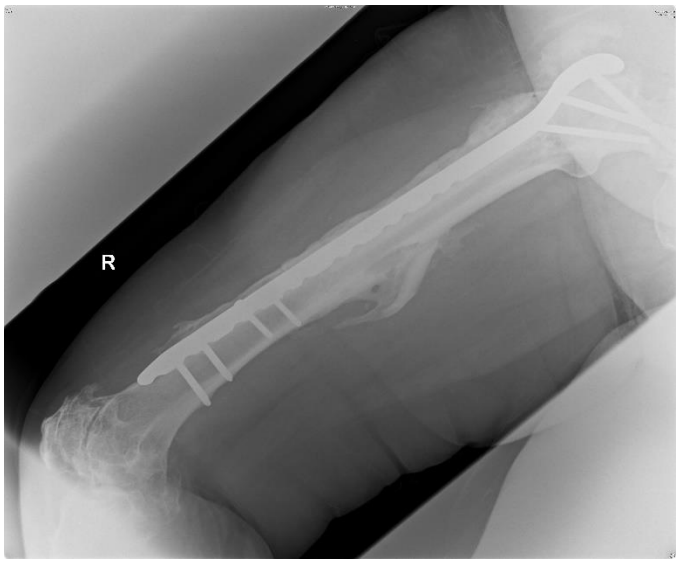

Fig. 2 Anteroposterior radiograph of the right femur on presentation (nine years after index trauma) shows a healed fracture with significant peri-implant new bone formation/involucrum.