Sir,

Surgical treatment of proximal femoral fractures is increasing as the fracture incidence is on the rise in an aging population.1,2 There are various techniques to treat intertrochanteric fractures, but proximal femoral intramedullary (IM) nailing has recently stood out for its biomechanical and structural stability advantages, enabling controlled weight-bearing immediately after surgery, and early rehabilitation.2 However, the authors experienced a femoral neck fracture that occurred without unusual trauma after the patient was treated with proximal femoral IM nailing for an intertrochanteric fracture.

An 89-year female was admitted to address 2 weeks of left hip pain while walking. Twelve months prior, she sustained a left femoral intertrochanteric fracture (classified as Boyd-Griffin type 2 and AO A 1.2) in a pedestrian traffic accident, and underwent closed reduction and internal fixation with Gamma 3 nail (Figure 1A). Postoperative radiographs showed the screw head in the middle of the femoral head, with a tip-apex distance of 16.2 mm. The last follow-up radiograph taken 8 months ago showed union of the injured bone and no evidence of metal failure (Figure 1B). No swelling or warmth was observed around the surgical scar. Simple hip radiographs and a 3-Dimensional Computed Tomography (3-D CT) scan showed union of the previous left femoral intertrochanteric fracture, but also displayed a left femoral neck fracture with displacement (Figure 1C). A bone density test showed osteoporosis (femur total T-score: -3.5). Metal removal and hip arthroplasty were performed after diagnosis of a femoral neck fracture. Union of the intertrochanteric fracture was observed at surgery. Bacterial testing of the joint fluid showed no growth. The patient recovered without complications after total hip arthroplasty, according to outpatient follow-up.

IM nailing as the treatment for intertrochanteric fractures is widely used as a substitute for the sliding hip screw, because the procedure reduces operative time, bleeding, and limb shortening, as well as decreases the hospital stay.1,2 It also has biomechanical advantages.

However, complications following IM nailing are still reported. Many factors are suggested to affect union after intertrochanteric fracture, including type of fracture, position of the screw, fracture location, accuracy of fracture reduction, osteoporosis, and underlying diseases.3,4 Several studies proved that the outcome of intertrochanteric fractures was closely related to osteoporosis, and failure or difficulty of maintaining fixed device status during or after surgery. According to Lung et al., if femoral neck fracture occurs despite adequate location of device and adequate length, osteoporosis has a greater effect on prognosis than operative technique.5 Osteoporosis in the elderly causes fragility fractures on minor trauma; where otherwise, generally a micro-fracture does not happen.6 Moreover, the stress in the bone close to the thread of lag screw is high, especially in patient with small femoral head.7 In our case, the total T-score of the femur was -3.5. The risk factors in this patient included advanced age, female gender, osteoporosis, and smaller size of the femoral head and neck. Fracture around the inserted device is caused by the difference in hardness of normal human bone and the inserted metal plate, causing stress concentration. In particular, if the patient has osteoporosis, the difference between bone and metal hardness increases significantly; thus, the risk of fracture around the structure increases.7 We report this case because femoral neck fracture following successful intertrochanteric fracture treatment with a Gamma 3 nail rarely occurs.

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