

Spontaneous Acetabular Periprosthetic Fracture in a Patient Continuously Having Zoledronic Acid

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Zoledronic acid has been used for prevention of osteolytic and osteoblastic bone metastasis. This case report illustrates an undesirable consequence from prolonged usage of zoledronic acid in bone metastasis prevention. Periprosthetic acetabular fracture in a patient treated with zoledronic acid for 7 years was reported. The clinical presentation, radiographic and pathological results were described. This is a rare complication after total hip arthroplasty which should not be ignored especially in patients who received long term bisphosphonate.

Keywords: Hip arthroplasty, Fracture, Loosening, Zoledronic acid, Bisphosphonate

Zoledronic acid has been used for prevention of osteolytic and osteoblastic bone metastases.¹⁾ Additionally, Bobyn et al.²⁾ demonstrated that bisphosphonates improved cementless implant fixation by enhancing osteointegration. However, a long-term usage of bisphosphonates has been reported to relate with atypical fracture in subtrochanteric area.^{3,4)} To our knowledge, the periprosthetic acetabular fracture in association with the use of bisphosphonate has never been reported. We report a case of periprosthetic acetabular fracture in a patient having continuous zoledronic acid.

CASE REPORT

A 75-year-old Asian woman was presented at our department in 2009, with a sudden right groin pain and a limp. She had the history of right breast cancer and was treated with simple mastectomy 15 years ago. She started her continuous course of 4-mg intravenous zoledronic acid therapy for every 6 weeks since 2002 when she was 68 years old. She developed progressive right hip pain due

to primary osteoarthritis and underwent cementless total hip arthroplasty (THA) in late 2007. The preoperative radiograph showed reactive lateral cortex thickening at subtrochanteric area (Fig. 1). Zoledronic acid course was ceased 3 months before the surgery and restarted again at 6 weeks after a THA. At the surgery, a specimen biopsy was taken around the right hip. The histological finding of the specimens and bones showed no evidence of malignant cells. The immediate postoperative radiograph is demonstrated in Fig. 2. Following the THA, she had pain-



Fig. 1. Preoperative radiograph showing the lateral cortex thickening in the subtrochanteric area and osteoarthritic change of the hip.

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free and improved clinical functions with well-aligned implant position shown on the radiograph. In 2009, following a long day of walking, she developed a sudden right groin pain and a limp. The radiograph and computerized tomography demonstrated a complete transverse acetabular fracture of the superomedial ilium with migration of acetabular component (Fig. 3). A revision total hip surgery was performed. Intraoperatively, the acetabular component was easily removed with no evidence of bone ingrowth while the femoral component was well-fixed. The gross appearance of the acetabulum was yellowish without any abnormal space occupying soft tissue. The specimen from the periacetabular bone revealed necrosis of hematopoietic marrow, fat with various calcifications, and diffuse lack of osteocytes as osteonecrosis (Fig. 4).



Fig. 2. Immediate postoperative radiograph.

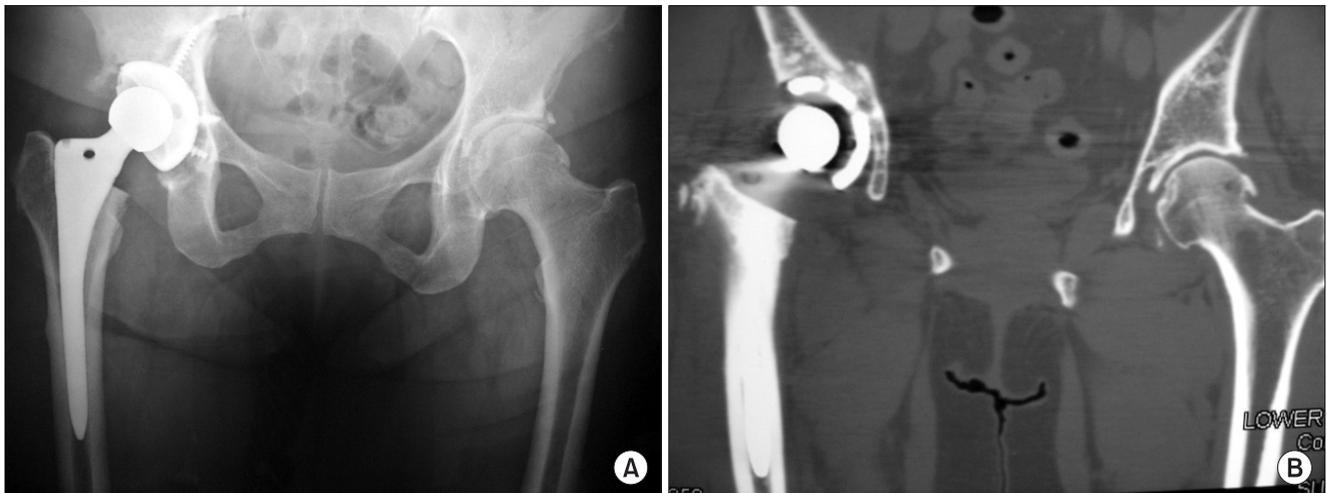


Fig. 3. Radiograph (A) and computer tomography scan (B) taken before the revision surgery showing transverse fracture of the acetabulum and loosened acetabular component.

DISCUSSION

Periprosthetic fracture of acetabulum is an uncommon complication after a THA.⁵ According to few of the previous studies, the causes of a postoperative fracture were related to unidentified intraoperative fracture,⁶ severe osteolysis,⁷ trauma,⁸ and stress fracture.⁹ We considered that the periprosthetic acetabular fracture in this study was associated with zoledronic acid, due to 2 reasons. Firstly, the cortical thickening was observed in the lateral (tension) side of the subtrochanteric area, on a preoperative radiograph (Fig. 1). This is a specific prefracture radiographic pattern resulting from a long-term use of bisphosphonate.¹⁰ It can relatively indicate that the patient had sufficient dosage or length of time on bisphosphonate administration to cause systemic negative effects. Secondly, the specimen collected from the periprosthetic acetabular fracture site presented an unusual pathological result (Fig. 4).

We believe that following the cementless fixation of the acetabular component, the stability was dependent on mechanical fit and screw augmentation, while the biological fixation has not been developed. The acetabulum failed due to the chronic stress from repetitive workload with daily activities. A spontaneous fracture can indicate an extreme inhibition of bone turnover following a long-term therapy of zoledronic acid. However, atypical fracture in subtrochanteric area did not occur in this case, because the application of femoral prosthesis bypassed the subtrochanteric area.

Zoledronic acid has been reported to have potential



Fig. 4. Photomicrograph of the bone from the acetabular fragment at the time of the revision arthroplasty showing complete absence of osteoclastic and osteoblastic activity.

role of inducing osteointegration in cementless prosthesis.²⁾ However, the findings in this case were discordant with those reported studies. These findings may indicate that zoledronic acid did not enhance cementless fixation or the doses administered in this case was not proper to induce osteointegration.

This case report informs the surgeons that a prolonged use of zoledronic for prevention of bone metastasis can cause periprosthetic acetabular fracture. The cessation of bisphosphonate, application of anabolic agent, and a period of delay before weight bearing may reduce the incidence of such complication. However, further study is needed to clarify these issues.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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