



Bilateral femoral neck fracture in a young patient receiving long-term hemodialysis: a case report with a 4-year follow-up

Uzun süreli hemodiyaliz tedavisi gören bir hastada iki taraflı kalça boyun kırığı:
Olgu sunumu ve 4 yıllık izlemi

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A 34-year-old male patient who was on hemodialysis developed a bilateral femoral neck fracture (Garden type III) after a minimal trauma. Bipolar cemented arthroplasty was performed in separate sessions. Pathological examination of biopsies obtained from the fracture site revealed osteodystrophy without any amyloid accumulation. Although the patient could walk without support, signs of bilateral prosthetic loosening were noted on X-rays after four years.

Key words: Arthroplasty, replacement, hip/methods; femoral neck fractures; hip prosthesis; renal dialysis/adverse effects.

Otuz dört yaşında erkek diyaliz hastasına, minimal travma sonrası oluşan iki taraflı femur boyun kırığı (Garden tip III) nedeniyle ayrı seanslarda bipolar sementli artroplasti yapıldı. Ameliyatta kırık bölgesinden alınan biyopsilerde osteodistrofi saptandı, amiloid birikimine rastlanmadı. Hastanın desteksiz yürüyebilmesine ve yakınması olmamasına karşın, dört yıllık takipte her iki kalça grafisinde protez gevşeme bulguları saptandı.

Anahtar sözcükler: Artroplasti, replasman, kalça/yöntem; femur boyun kırığı; kalça protezi; renal diyaliz/yan etki.

As survival of renal failure patients increase, there is also a corresponding increase in the incidence of pathological hip fractures occurring on the basis of renal osteodystrophy.^[1] The results of long-term follow-up are rare because of comorbidities and high postoperative complication rates in these patients. The optimal treatment method for these fractures is still unclear.

Herein, we report bilateral hip fracture of a hemodialysis patient and review treatment alternatives for these fractures.

CASE REPORT

A 34-year-old male patient presented to our emergency department with complaints of bilateral hip pain. His left hip was injured when he struck his left

foot to a rug, resulting in injury to the right hip upon falling. His X-rays revealed a bilateral (Garden type III) femoral neck fracture (Fig. 1a, b). He had a history of hemodialysis for 10 years due to renal failure, which resulted from glomerulonephritis.

Blood urea nitrogen (BUN), creatinine, electrolytes, and complete blood count were measured daily. Dialysis program was arranged a day before and after the operation. Cemented bipolar hemiarthroplasties were performed with a week interval. First-generation cementing technique was used as, at that time, we could not find the necessary equipment for second- or third-generation cementing. There were no postoperative complications. Two units of allogenic blood were transfused after both operations.

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Fig. 1. (a, b) Preoperative X-rays depicting left and right femoral neck fractures.

Pathological examination revealed fibrosis in the intertrabecular region and changes in lamellar bone showing osteoblastic and osteoclastic activity (irregular callus formation). There were no amyloid depositions in both hips.

The patient walked with the help of a cane during the first six weeks. He was pain free and could walk without any aid at the end of three months. At one-year follow-up, signs of prosthetic loosening were noted in the left hip (Fig. 2).

One year after surgery, the patient moved to another city and was lost to follow-up till the post-operative fourth year. On his fourth year examination, he had 100 degrees flexion in both hips without any contractures. Internal rotation was 0-5 degrees in both hips and external rotation was 30 degrees on the left and 40 degrees on the right side. His X-rays revealed bilateral gross periprosthetic radiolucency, myositis ossificans, and stem subsidence (Fig. 3). Despite radiographic evidence for prosthetic loosening he did not complain about any thigh or groin pain.

DISCUSSION

There is limited knowledge in the literature regarding hip fractures in hemodialysis patients with underlying renal osteodystrophy. Fractures

on both sides have rarely been reported. Hardy et al.^[2] reported a bilateral fracture in six of 26 cases, Klein et al.^[3] in one of eight cases, Sano et al.^[4] in two of 12 cases, and Tierney et al.^[5] in one of 12 cases. Karapinar et al.^[6] reported a single case.

Pathological fractures are generally seen in osteoporotic patients with an older age. Mortality in the first year ranges between 11% and 24%.^[7]



Fig. 2. X-ray of both hips at postoperative one year. Prosthetic loosening is noted in the left hip.



Fig. 3. X-ray in the postoperative fourth year showing bilateral gross periprosthetic osteolysis and bilateral prosthetic migration.

Hip fractures are 20 times more frequent in dialysis patients, and first year mortality is 29% to 58%.^[1-5] This high mortality rate in dialysis patients is associated with electrolyte imbalances, bleeding disorders, anemia, uremia, immune suppression, and infections.^[1] Considering the high postoperative mortality, the choice of the initial operative procedure is very important to avoid secondary operations. There is no absolute criteria to choose between arthroplasty (partial, total, cemented, cementless) or osteosynthesis.

Displaced subcapital fractures pose an increased risk for secondary operations because of nonunion.^[8] Despite the high nonunion rate in subcapital fractures treated after six hours from injury, there is still a chance of union and this opportunity may be given to especially young patients. Even in nondisplaced fractures, amyloid accumulation at the fracture site can cause failure of osteosynthesis.^[2-5] Despite 10 years of hemodialysis in our case, no amyloid accumulation was seen at the fracture site.

In a series of 12 patients, Sano et al.^[4] showed that intracapsular fractures were more frequent in patients receiving long-term hemodialysis and that these patients had more amyloid deposition. Moreover, intraoperative bleeding was more frequent, together with prosthetic loosening in the short-term.^[4,9] Following total hip arthroplasty,

Naito et al.^[10] reported 35% aseptic loosening in 7.6 years, and Sakalkale et al.^[11] reported 13% acetabular loosening in three years. In another series of 15 patients (24 hips) having a mean age of 39 years, loosening was found in 58% within eight years, with a mean time to revision being seven years.^[12]

Patients undergoing hemodialysis may have various skeletal abnormalities such as osteomalacia or hyperparathyroidism, and recently, intraosseous deposition of beta-2-microglobulin amyloid has been added to the list. Amyloidosis and other skeletal abnormalities caused by maintenance hemodialysis may weaken the bone and account for the high incidence of loosening.^[10]

As the fragments were displaced, we preferred hip arthroplasty in our patient. We preferred bipolar arthroplasty to total hip arthroplasty because of the integrity of the acetabular cartilage. With bipolar hip arthroplasty, the operation time is short and later, conversion to a total hip arthroplasty is easier. Although the patient had no complaints, there were gross findings of prosthetic loosening. Early loosening of the prostheses was primarily attributed to the use of first-generation cementing technique, and secondarily to the presence of renal osteodystrophy. As the patient was young and probably would have a longer life expectancy, he definitely would need a second operation at a later time.

In conclusion, in young patients, even displaced intracapsular fractures should first be treated with osteosynthesis. Considering a relatively long life expectancy, osteosynthesis should be preferred to arthroplasty as the first line treatment. If the surgeon chooses to perform arthroplasty, the use of first-generation cementing technique should be avoided.

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