Chapter 21
Complications of Uncemented Total Hip Arthroplasty: Success

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Case Presentation

A 36-year-old female Hispanic patient, with history of pituitary adenoma requiring removal in April of 1993 with subsequent use of dexamethasone, presented for the first time to the office in May 1994 complaining of severe bilateral hip pain. The pain was intermittent at night and it was partially relieved by Naproxen. There was no limitation in her walk-

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ing distance and no need of any assistive device. At physical examination, the patient had a mildly antalgic gait and leg length was equal. Hip range of motion was symmetrical on both sides and consisted of flexion 110°, internal rotation 40°, external rotation 30°, abduction 20°, and adduction 40°.

Diagnosis/Assessment

The patient brought radiographs which demonstrated bilateral osteonecrosis of the femoral heads without collapse. The lesions, in both hips, were classified according to the staging system of Steinberg et al. [1] as stage IIB (cystic and sclerotic changes in the femoral head with 15–30% of femoral head compromise). [2] (Figs. 21.1 and 21.2).

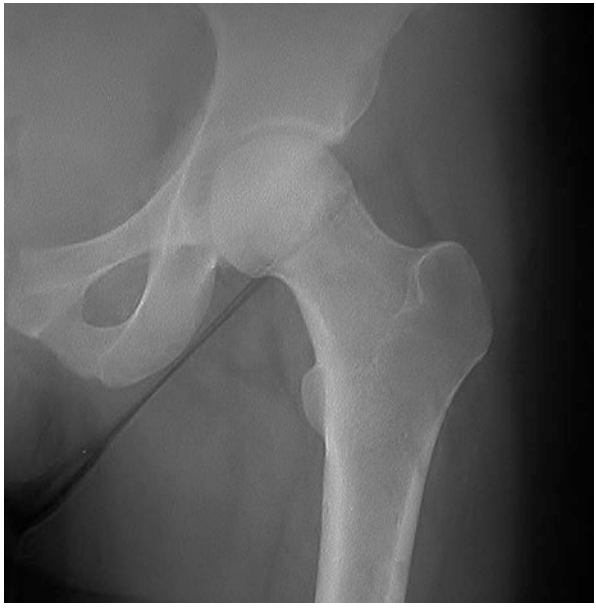

Figure 21.1 Anteroposterior radiograph of the left hip before the core decompression. There is good articular space and no evidence of collapse of the femoral head

FIGURE 21.2 Lateral radiograph of the left hip before the core decompression. There is good articular space and no indication of femoral head collapse

Management

The patient underwent bilateral core decompression in June 1994. An 11 mm drill was inserted in to the lesion under fluoroscopy, followed by partial coring of the lesion with a curette which was then taken through the same incision. Postoperatively, the patient was wheelchair bound and allowed only bathroom transfers for 6 weeks with advanced weight bearing over the following 4 weeks. Pathology confirmed the diagnosis of osteonecrosis in both femoral heads.

Outcome Bilateral Core Decompression

The patient recovered from both procedures uneventfully. At 3 months postoperatively, she complained only of slight pain in the right hip while the left hip was pain free. Thereafter, she started full weight bearing as tolerated. Approximately 5 months

Figure 21.3 Anteroposterior radiograph of the right hip after the core decompression demonstrating collapse of the femoral head and a subchondral fracture

after the procedures, she started dancing and complained thereafter of severe pain in the right hip. The patient was promptly evaluated and found to have collapse with subchondral fracture of the femoral head in the right hip (Fig. 21.3).

She was placed on crutches with significant improvement of her pain, to the point that after 2 weeks they pain resolved. Then, weight bearing was restarted as tolerated up to full weight bearing. For several years, the patient complained only intermittently from pain in the right hip (moderate at most) but overall she did well and lived a completely normal life; including dancing. Nine years after the core decompressions, she remained pain free with a normal gait and flexion of 120° in both hips. Internal rotation on the right side was 10° and 40°

Figure 21.4 Anteroposterior radiograph of the pelvis demonstrating collapse of the femoral head and arthrosis of the right hip 20 years after the core decompression. The left hip shows no signs of collapse, and it also shows good preservation of the articular space (20 years after the core decompression)

on the left side. Thirteen years after both procedures, the patient was happy with the results and only had mild periodic pain without need for pain medications. Twenty years after the bilateral core decompression, in 2014, the patient complained of pain in the right hip; this pain was progressively worse for the last 6 years. The pain in the right hip was worsened by standing and by long periods of activity, and it was improved by walking. There were no flexion contractures bilaterally. Flexion was 90° on the right side and 100° on the left, internal rotation was 0° (right) and 35° (left), external rotation was 30° (right) and 45° (left), abduction was 20° (right) and 45° (left), and adduction was 10° on the right side and 45° on the left hip. The right hip radiographs demonstrated complete collapse of the femoral head, joint space was bone on bone, subchondral sclerosis on both the femur and acetabular side, and clear femoral head deformity from previous collapse (Figs. 21.4 and 21.5). The patient decided 20 years after the core decompression to finally undergo a right total hip arthroplasty.

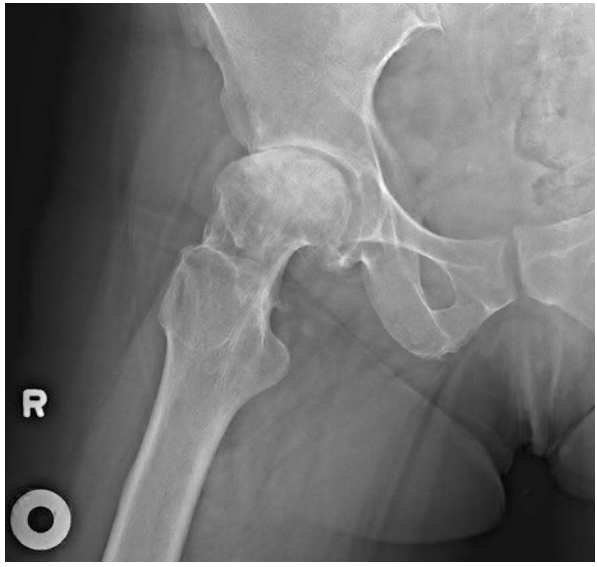

FIGURE 21.5 Lateral radiograph of the right hip demonstrating loss of articular space 20 years after the core decompression

Outcome

Postoperatively, the patient evolved uneventfully. Six months after surgery, she was able to walk without limitations and to go up the stairs normally holding to the rail. She is currently satisfied with the surgery and performs her routine daily life activities successfully and without any limitations (Figs. 21.6 and 21.7).

Literature Review

This case illustrates how the exposure to steroids is indeed an important factor in the development of osteonecrosis of the femoral head. It also demonstrates how the preservation of the femoral head thanks to a core decompression may be

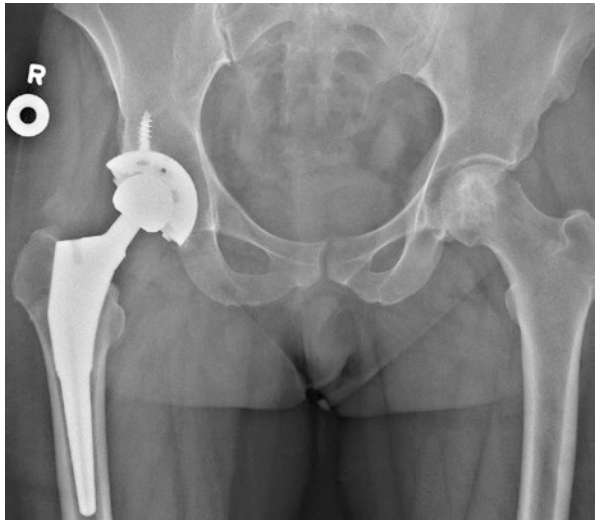

FIGURE 21.6 Anteroposterior radiograph of the pelvis performed after cementless right total hip arthroplasty

attempted in younger patients without head collapse [3]. The left side in this case still remains pain free 21 years after the core decompression. In the early stages, the first radiographic findings usually consist of cystic and sclerotic changes in the femoral head as clearly demonstrated in this patient [4, 5]. One of the lessons that we can draw from this particular case is that, due to the low risk, core decompression should be attempted to prevent the collapse of the femoral head. This is particularly important in younger patients. In this particular case, it allowed the patient to receive a better articulating surface since most of the polyethylene used in 1993 was not highly cross-linked and for sure would have required at least one revision in the last 20 years.

This case also shows that even in face of femoral head collapse, total hip arthroplasty reliably achieves rapid pain relief and functional recovery with a single procedure. Recent series with longer follow-up regarding the use of cementless THA for osteonecrosis are encouraging, with reported

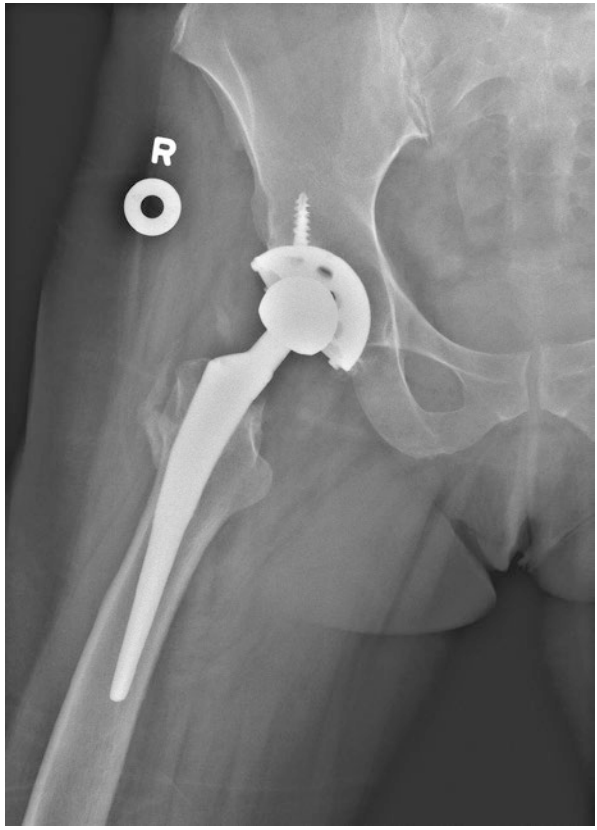

Figure 21.7 Lateral radiograph of the right hip performed after total hip arthroplasty

long-term survivorships exceeding 90%. Kim et al. [6], using modular stem cementless THAs in patients younger than 50 years, reported 93.8% of survivorship at a minimum follow-up of 15 years using stem revision for any reason as the end point (for aseptic loosening exclusively, the survivorship was 100%). As noted by the group of Callaghan, [7] the long-term survivorship of cementless THAs in patients with osteonecrosis encourages us to continue to use cementless devices

in these patients. Michael Mont and his group reported a 95% aseptic implant survivorship at a mean follow-up of approximately 7.5 years in patients diagnosed with sickle cell disease. [8] It cannot be overemphasized that early diagnosis and treatment with core decompression are crucial to preserve the femoral head, but in face of collapse, a cementless THA consistently achieves immediate pain relief and functional recovery. Johnson et al. [9] performed a 16-year analysis of the Nationwide Inpatient Sample concerning the treatment of femoral head osteonecrosis in the United States. The report suggests an improvement in the survivorship of THA since 1993. In 1992, 75% of the procedures performed to treat hip osteonecrosis were total hip arthroplasty, but this figure increased to 88% in 2008. During the same period of time, the rate of joint-preserving procedures dropped from 25% to 12%. Surgeons are more frequently performing total hip arthroplasty to treat patients with osteonecrosis, and as a result, an increasing percentage of osteonecrosis patients are currently treated with THA.

In summary, and in spite of the variety of procedures proposed to treat this particular condition [10–12], a simple core decompression in face of pre-collapse lesions and a total hip arthroplasty in presence of collapse and/or arthrosis of the femoral head appear to be dependable and recognized options for the treatment of osteonecrosis of the femoral head.

Clinical Pearls and Pitfalls

- Core decompression should always be considered in young patients with osteonecrosis of the femoral head without collapse. This is of utmost importance in younger patients.
- Currently, total hip arthroplasty is associated with excellent survivorship in those cases with diagnosis of osteonecrosis of the femoral head

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