CASE REPORT

Case Report: Painless Chronic Liner Dissociation of a Total Hip Arthroplasty

Jorm M. Nellensteijn MD, David R. Nellensteijn MD,
Tjitte De Jong MD

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Abstract

Background Dislocation or liner dissociation of a total hip prosthesis usually results in pain and discomfort. Although several reports describe chronic dislocation and its treatment, chronic liner dissociation is an unreported complication.

Case Description We report an unrecognized dissociation and displacement of the liner of a total hip prosthesis after

revision THA. The patient had virtually no pain or functional restrictions. The patient's only complaint was pain on the contralateral side, associated with a leg-length discrepancy. Since the patient had no complaints relative to the liner dissociation we elected not to pursue further treatment. The contralateral pain was treated successfully with a shoe lift.

Literature Review Chronic dislocation of a THA is a rare complication and we found reports of only seven cases in the literature. We found no reports of chronic liner dissociation.

Clinical Relevance Orthopaedic surgeons should be aware of the possibility of this rare complication. Our case and the literature suggest treatment can be nonsurgical or surgical.

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Each author certifies that his or her institution approved or waived approval for the reporting of this case and that all investigations were conducted in conformity with ethical principles of research.

This work was performed at Spaarne Hospital, Spaarne Ziekenhuis, Hoofddorp, the Netherlands.

J. M. Nellensteijn (✉)

Department of Orthopedics, Spaarne Hospital,
Spaarne Ziekenhuis, Spaarnepoort 1, 2134 TM
Hoofddorp, the Netherlands
e-mail: jmnellensteijn@hotmail.com

D. R. Nellensteijn

Department of Surgery, St. Elisabeth Hospital,
Willemstad, Curaçao

T. De Jong

Department of Orthopedics, Hospital Bourtange,
Bourtange, the Netherlands

Introduction

Dislocation is an unfortunate but common complication after a THA (0.5%–6%). After revision surgery, the risk of dislocation is even higher (range, 6%–10%) [7]. The risk of a late dislocation depends on multiple factors: neuromuscular and cognitive problems, compliance of the patient, and revision surgery [19]. Surgical contributing factors are soft tissue tension, acetabular and femoral component positions, impingement, cup size, and the type of liner [19]. Complications that can occur with a polyethylene liner may include fractures, wear, and dissociation [5]. Dislocation of the hip usually induces pain, shortening, rotational deformities of the leg, and functional limitations. However, the literature contains some reports of patients with painless or relatively painless chronic dislocations. A PubMed search using “total AND hip AND (arthroplasty OR replacement) AND chronic dislocation” yielded 44 reports of which

seven concern chronic prosthetic dislocations [3, 9, 10, 12, 15, 18, 20].

We describe a patient with unrecognized, painless chronic liner dissociation after revision surgery.

Case Report

An 85-year-old woman attended the outpatient clinic for progressive pain over the right greater trochanter of several months duration. She was able to walk unlimited distances with a rolling walker but had noticed a leg-length discrepancy (the left leg being short) for more than a year. Her history revealed a THA after a left femoral neck fracture 14 years ago. Three years before presentation her THA cup had been revised for complaints related to liner wear and osteolysis of the acetabulum. Through a straight lateral approach, impacted bone grafting with donor bone was performed in the cavity of the acetabulum and the cup and liner were revised. During regular followups at 6 weeks and 1 year, no clinical or radiographic abnormality was found (Fig. 1). The patient did not attend our clinic again.

On presentation she had an antalgic gait. The greater trochanter was tender to palpation. Motion of the right hip was painful on the lateral side of the thigh. The left hip was painless and had full ROM. She had a 45 mm leg-length-discrepancy measured with a standing block. A radiograph of the pelvis showed a cephalic dislocation of the THA and a neoacetabulum in the iliac wing (Fig. 2). The metal cup had rotated compared with previous radiographs. The radiographic images and painless articulation in the left hip raised the suspicion of a dissociation and displacement of the liner from the socket along with the femoral component. A CT scan confirmed loosening of the cup and a

radiolucent area around the head that followed the dimensions of the polyethylene liner (Fig. 3).

On further questioning the patient could not remember any event that might be related to the dislocation. Given her age, duration of the dislocation, painless articulation, and her ROM and adequate level of function, we elected to leave the dislocation. The pain of the right side was diagnosed as trochanteric bursitis related to the leg-length discrepancy. The patient was prescribed a 4-cm heel lift on the left side. After 6 weeks the pain had disappeared completely.

Discussion

Chronic dislocation of a prosthesis can be challenging. An unrecognized chronic dislocation of the liner forming a new articulation after dissociation has not been described previously and the literature contains only seven case studies of chronic dislocation and its treatment [3, 9, 10, 12, 15, 18, 20]. Recently Lidder et al. [12] described a 60-year old patient with a painless chronic prosthetic dislocation. The dislocated femoral component had formed a neoacetabulum in the ilium in which it was freely articulating. He had leg length shortening and good ROM. As with our patient, their patient reported contralateral hip pain and underwent a total hip replacement owing to arthritis on the contralateral side. The painless dislocated hip prosthesis was not treated. Kindsfater et al. [10] described an 82-year-old patient with degenerative knee problems 12 years before a THA was performed. Because of a leg-length discrepancy, a radiograph of the pelvis was obtained. The radiograph showed a vertically rotated

Fig. 1 This radiograph shows the pelvis after surgery. The cup is well positioned after bone impaction grafting of the acetabulum.

Fig. 2 A radiograph of the pelvis obtained 3 years after revision surgery shows a cephalic dislocation of the THA and neoacetabulum in the iliac wing. The metal cup has loosened and rotated compared with previous radiographs.

Fig. 3 This CT scan shows the radiolucent area that follows the dimensions of the liner.

uncemented cup with dislocation of the stem. The prosthetic head articulated painlessly in the superior portion of the acetabulum. The hip was not treated. In the following 3 years there were virtually no hip complaints. In response to the previously cited case study, Salvi [18] described a patient with progressive pain several years after a fall on the location of her THA. A radiograph showed rotation of the cemented cup with dislocation of the stem and formation of a pseudoacetabulum, superior and lateral to the cup. During revision surgery, the rotated cup was stable. Owing to a risk of neurovascular injury, the cup was left in situ, and a second, cemented, polyethylene cup was placed next to the old cup in the correct abduction and anteversion position. The patient remained free of symptoms at her 5-year followup. Butler et al. [3] described a successful closed reduction in a patient with chronic dislocation after revision THA. The dislocation had been present 6 years, and the shortening was approximately 10 cm. The surgeons used an Ilizarov fixator to stretch the soft tissues slowly. After 6 weeks, closed reduction was performed. The treatment was complicated by pulmonary embolism and pin tract infections, from which the patient recovered. After reduction the patient had a mild, positive Trendelenburg sign but was able to walk unaided. Suh et al. [20] described a patient who for 3 years had a dislocation after revision THA and shortening of 6 cm. The surgeons used femoral skeletal traction for 8 days. Closed reduction was not possible because of interposition, and open reduction was performed. After followup of 3 years, the patient walked without aids and was free of pain. Kadar et al. [9] described a complication of chronic dislocation of a hip prosthesis. The bedridden patient presented with a pressure sore with the prosthetic femoral head protruding through the skin. The patient was treated with removal of the implant. Recently Odak et al. [15] described the presence of the radiologic feature of formation of a pseudoacetabulum in a

patient with a chronically dislocated and asymptomatic THA. This patient was treated with reposition while under general anesthesia.

Dissociation of the polyethylene liner and metal cup is frequently described [1, 4, 13, 16, 17] but typically is immediately recognized. Dissociation can occur if the surgeon does not correctly lock the liner into the cup, for example, owing to interposition of soft tissue. During the operation, the surgeon must verify whether the liner is locked firmly into the metal cup. Late dissociation may result from impingement [6]. Suboptimal mechanical fixation of the liner in the metal cup also can be caused by failure of the locking mechanisms of the components. Technical modifications of some types of acetabular components have diminished the problems of dissociation [6]. Dissociation of the liner and cup used in this case (Trident acetabular cup with polyethylene liner, Stryker®, Montreux, Switzerland) has not been described previously; however, in the ceramic variant, dissociation and malposition were described [14]. In contrast to the ceramic variant, it is difficult to identify the problem with plain radiographs if a polyethylene liner has been used. Liners with a radiographic marker might help make these easier to identify [11]. Ultrasound and CT scans have been helpful when dislocation or dissociation of polyethylene liners is suspected [2, 8].

According to the “Dutch guideline on total hip prosthesis” [21], routine physical and radiologic followups of patients after THAs are indicated during the first year and after 5 years or sooner if needed, based on the experiences of the surgeons with the prostheses used in the THAs. There is no directive for followup frequency after revision surgery. Our patient underwent revision surgery with impaction grafting. After 1 year the cup was still in good position. The patient did not return for followup afterward. It is unclear when the dissociation occurred. If the patient had additional followups, a loose cup might have been

recognized at an earlier stage. The dissociation might have been avoided if it had not occurred by that point.

This report illustrates that a dissociated liner can displace and form a painless joint cephalad to the native acetabulum allowing full ROM. Treatment can be nonsurgical.

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