

Case Report

Prosthetic Loosening after Left Hip Replacement with Concurrent Osteoarthritis of the Left Knee and Ankle

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Received: August 08, 2024**Accepted:** August 27, 2024**Published:** September 04, 2024**Abstract**

Hip replacement surgery is a vital treatment for hip joint conditions like femoral head necrosis, acetabular dysplasia, and femoral neck fractures, offering significant benefits to many patients. However, prosthetic loosening is a frequent postoperative issue that can induce pain and potentially impair the surgical outcome. Delayed treatment can exacerbate prosthetic loosening, leading to diminished hip stability and thus causing pain and restricted movement. Prolonged discomfort may reduce joint flexibility and lead to muscle atrophy, thereby increasing the stress on the joint. In the case of left hip replacement, the patient experienced increased stress on the left knee during ambulation due to prosthetic loosening. Long-term overloading led to aggravated wear on the left knee, precipitating knee Osteoarthritis (OA). The clinical symptoms of Knee OA include joint pain, swelling, stiffness, and limited range of motion.

Similarly, after left hip replacement, the prosthetic loosening resulted in additional stress on the left ankle during walking. The sustained overloading caused increased wear of the ankle, leading to ankle OA. The clinical manifestations of ankle OA mirrors those of knee OA, featuring joint pain, swelling, stiffness, and limited range of motion.

Keywords: Post-Hip Replacement; Prosthetic Loosening; Prosthetic Revision; Knee Osteoarthritis; Ankle Osteoarthritis

Introduction

Causes of loosening of hip prosthesis [1]: 1 Surgical technique installation issue: The joint prosthesis is prone to loosening if not firmly installed during surgery. With the ongoing refinement of surgical techniques, the incidence of prosthetic loosening associated with surgical techniques is on the decline. Infection, a risk inherent to all surgical procedures, can complicate post-replacement recovery. When an infection occurs following an artificial joint replacement, it hinders the effective integration of the prosthesis with the bone, which may result in prosthetic loosening. 3 Osteolysis reaction: when the artificial joint is used for a long time, the particles produced by the wear of the hip joint react with the bone tissue to loosen the joint prosthesis. 4 Trauma: If the patient falls after joint replacement, it may lead to prosthetic loosening. 5 Patient's own causes: severe osteoporosis, overweight, etc., all of these factors will affect the stability and longevity of the joint prosthesis. 6 Different fixation methods: different fixation methods of prosthesis, such as distal fixation, proximal fixation, cement fixation, and biological fixation, have different loosening rates.

Case Report

The patient, a 61-year-old female, was hospitalized for 10 days with pain in her left hip, knee and ankle, as well as limited mobility in her left lower limb. The patient reported that she had undergone left hip arthroplasty for an intertrochanteric femoral fracture 18 years ago at a local hospital, with a favorable postoperative recovery. However, three years prior to her current admission, she began experiencing left hip pain, which was temporarily alleviated by oral pain medication without further evaluation. One year prior to admission, the patient's symptoms worsened with pain in the left knee and ankle, along with difficulty in walking on her left lower limb. The symptoms have recently intensified, prompting her to seek medical attention at our facility. Physical examination showed significant tenderness in the left hip area, marked restriction of hip mobility, and a shortening deformity of the left lower limb (Figure 1). A Computed Tomography (CT) scan revealed loosening of the left hip prosthesis, superior displacement of the greater trochanter, and inferior displacement of the femoral stem (Figure 2). Radiographs indicated changes in the alignment of the left lower



Figure 1: The physical examination showed pronounced tenderness in the left hip area, severely limited mobility of hip joint, and a noticeable shortening deformity of the left lower limb.

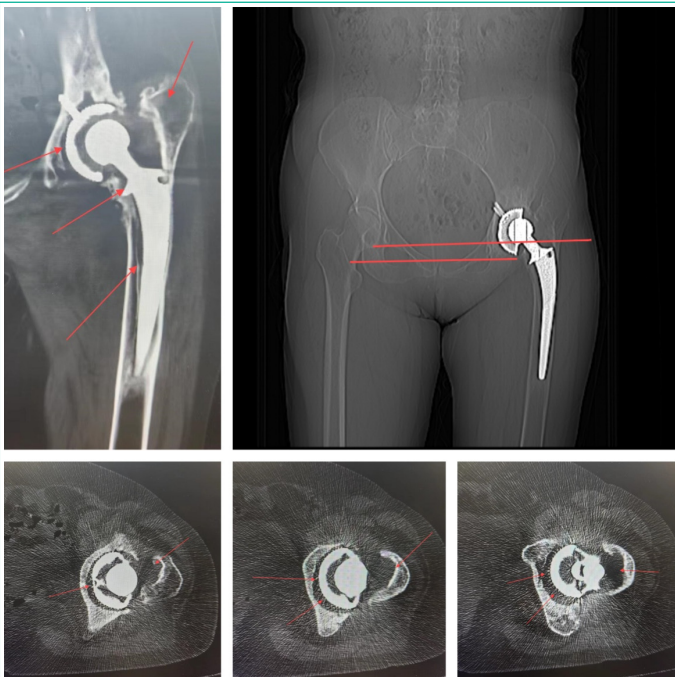


Figure 2: The CT scan demonstrated loosening of the left hip prosthesis, with superior displacement of the greater trochanter of femur and inferior displacement of the femoral stem.



Figure 3: The X-ray revealed alterations in the alignment of the left lower limb, longitudinal displacement of the prosthesis, and osteoarthritis of the left knee and ankle.

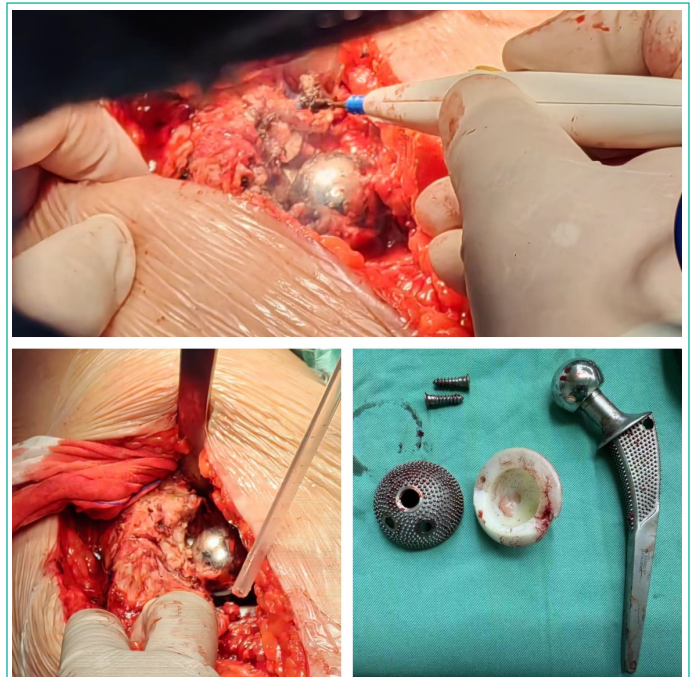


Figure 4: The image displays the surgical procedure in which the loosened prosthesis was removed, and the hyperplastic synovial tissue and necrotic tissue were excised using an electrocautery knife.

limb, longitudinal displacement of the prosthesis, and osteoarthritis in both the left knee and ankle (Figure 3).

Upon admission, the patient received a comprehensive examination of her left hip. Subsequently, she was taken to the operating room where she underwent an artificial left hip joint revision surgery under general anesthesia. Prosthetic loosening, swelling of the surrounding soft tissues, and synovial hyperplasia were observed during the surgery. The compromised prosthesis was carefully extracted, and the hyperplastic synovial tissue and all necrotic material were excised using an electrocautery knife (Figure 4). The surgical site was meticulously prepared by initially dilating the cavity using a stem test mold, followed by thorough irrigation with saline to minimize the risk of infection. A femoral stem of suitable size was then selected based on the dimensions of the femoral canal. The implantation of femoral stem was carried out cautiously, and a choice was made between a lengthened stem and a combined stem according to the patient's specific clinical scenario. The positioning of the new prosthesis was confirmed to be satisfactory (Figure 5). Two days after surgery, the patient was able to commence ambulation. Radiographs confirmed that the implanted hardware was correctly positioned (Figure 6). Physical examina-

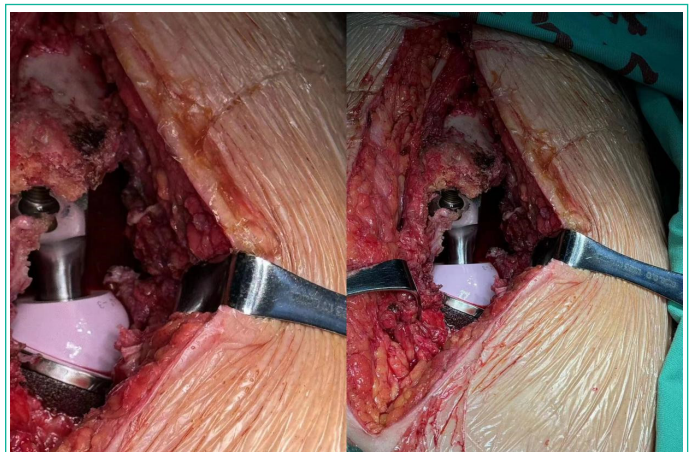


Figure 5: The post-implantation inspection confirmed that the prosthesis was correctly positioned within the joint.

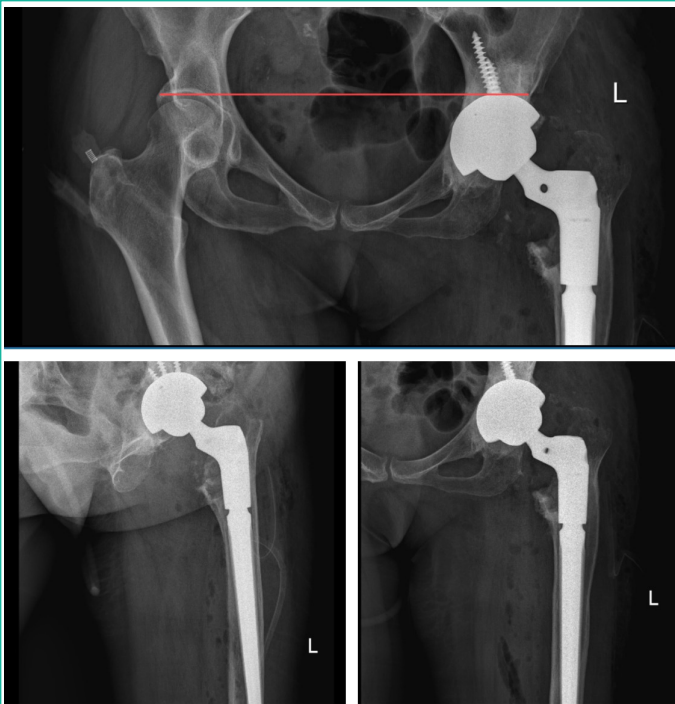


Figure 6: The X-ray confirmed that the surgical hardware was well positioned after implantation.



Figure 7: The postoperative assessment showed a significant restoration in the length of the patient's left lower limb compared to the preoperative condition.

tion revealed a significant improvement in the length discrepancy of the patient's left lower limb compared to her preoperative state (Figure 7). The patient was discharged with a plan for ongoing recovery and follow-up.

Discussion

Following the loosening of the left hip joint prosthesis, the mechanical stability of the patient's left lower limb was compromised, leading to a cascade of complications that necessitated timely intervention [2]. The surgeon proceeded with a surgical revision of the patient's left hip replacement, effectively repositioning the prosthesis and thereby enhancing the joint's stability [3]. For the management of the left knee and ankle, the patient was prescribed non-steroidal anti-inflammatory drugs (NSAIDs), analgesics, and other medications aimed at alleviating joint pain and inflammation [4,5]. Additionally, the patient was recommended to take postoperative rehabilitation exercises, with the goal of strengthening the musculature surrounding the joint and improving the joint mobility through a tailored regimen of therapeutic activities.

Author Statements

Conflict of Interest

The authors have no financial disclosures or other conflicts of interest to report related to the content of this article.

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