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ORIGINAL ARTICLE

Rare Case Report of Hip Dislocation and Pain Caused by Suture Anchor Falling into the Acetabulum

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Abstract

The use of suture anchors is common in hip-related surgeries, but it is extremely rare for a suture anchor to fall into the acetabulum and cause complications such as hip dislocation and pain. This article reports a case of a 77-year-old female patient who experienced hip dislocation and pain due to a suture anchor falling into the acetabulum. The patient was admitted to the hospital due to dislocation of the left artificial femoral head after surgery. During the operation, it was discovered that the suture anchor had fallen into the acetabulum, causing hip dislocation and pain. After surgical removal of the anchor and reduction of the hip joint, the patient's symptoms were significantly relieved. This article, combined with a literature review, explores the potential mechanisms of suture anchor displacement into the acetabulum and its impact on hip joint stability.

Keywords: Suture anchor; Hip pain; Hip dislocation; Artificial femoral head

Introduction

Suture anchors are commonly used internal fixation devices in orthopedic surgery, primarily for securely attaching soft tissues (such as tendons, ligaments, and joint capsules) to bone surfaces to restore anatomical structures, enhance joint stability, and promote the healing of injured tissues [1, 2]. Hip dislocation refers to the pathological condition where the femoral head is completely or partially displaced from the acetabulum. Factors such as improper prosthesis placement, insufficient soft tissue tension, and failure of internal fixation devices can all lead to dislocation [3, 4]. This case report presents a rare cause of hip dislocation: dislocation caused by a suture anchor falling into the acetabulum, leading to pain. This specific scenario has not been previously reported in the literature.

2. Case Report

A 77-year-old female patient was admitted to the hospital due to left hip pain and limited mobility one day after a fall. She underwent "left artificial femoral head replacement surgery," which was successful, and she was discharged with good postoperative recovery. Twenty days after the surgery, the patient experienced left hip pain again and was readmitted for examination. Left hip anteroposterior and lateral X-rays showed left hip dislocation (Figure 1).

Figure 1 Anteroposterior pelvic X-ray showing dislocation of the left artificial femoral head. The white arrow indicates the location of the hip dislocation

Physical examination revealed the following: the affected limb exhibited flexion-adduction-internal rotation deformity with shortening, palpation indicated emptiness in the left acetabulum area, significant tenderness (++) in the lateral and groin areas of the left hip, and active and passive movement of the left hip joint was significantly limited, accompanied by elastic fixation. Special tests showed positive longitudinal percussion pain (+), and Nelaton's line and Bryant's triangle measurements indicated upward displacement of the greater trochanter, with significant differences compared to the healthy side. Dorsalis pedis artery pulsation was palpable, and peripheral blood supply showed no significant abnormalities. The range of motion and stability of the left hip joint were significantly reduced compared to the healthy side, indicating abnormal joint alignment.

On the third day of admission, a left hip dislocation manual reduction was performed. The patient was placed in a semi-right lateral position, and palpation revealed emptiness in the left hip area with significant tenderness. The left lower limb was in a state of elastic fixation, with slight flexion of the knee joint. Left hip joint traction reduction was performed: one doctor held the affected limb with the knee flexed to the maximum adduction position, while another doctor stabilized the patient's pelvis, applying pressure with one hand on the anterior superior iliac spine and the other hand on the femoral head. A distinct clicking sound was heard from the left hip joint, and palpation indicated fullness in the left hip area. C-arm fluoroscopy showed normal structural relationships and joint space in the left hip joint, but the suture anchor had been brought into the acetabulum (Figure 2).

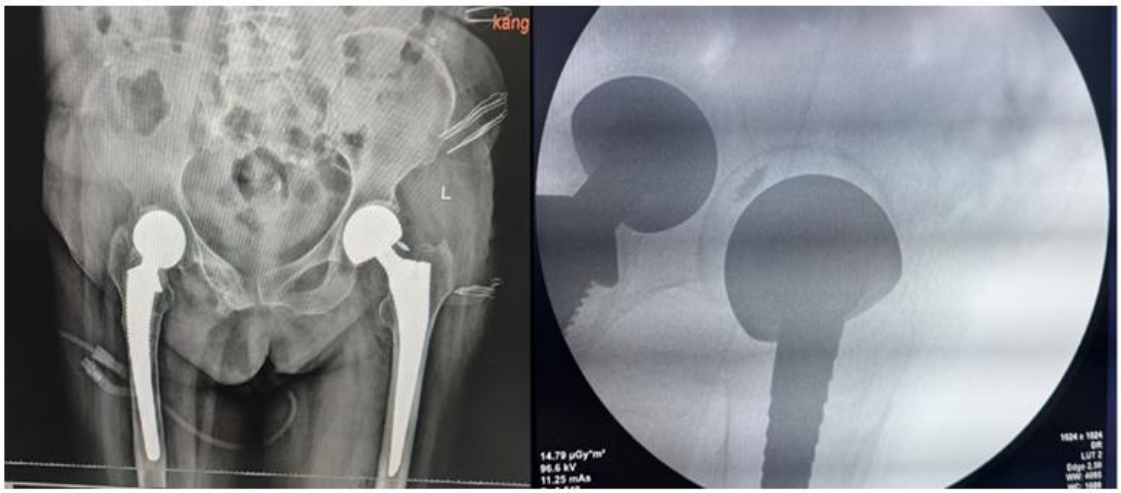

Figure 2 | Anteroposterior and lateral pelvic C-arm fluoroscopy showing the anchor embedded in the acetabulum, with a small area of high-density shadow around the acetabulum. The white arrow points to the suture anchor.

The patient and her family were informed of the reduction outcome, and a decision was made to schedule a left hip acetabular anchor removal surgery. Postoperatively, the patient was returned to the ward and advised to maintain left lower limb abduction and external rotation, avoiding strenuous activities.

On the fourth day of admission, the patient underwent left hip acetabular anchor removal surgery under combined spinal-epidural anesthesia. The patient was placed in the right lateral position, and the surgical area was routinely disinfected and draped with sterile adhesive film to protect the incision. The original posterolateral hip incision, approximately 10 cm long, was used. The skin, subcutaneous tissue, fascia, and tensor fasciae latae were incised layer by layer, and the external rotator muscles were detached. Exploration revealed dislocation of the left artificial femoral head, with the non-absorbable suture anchor dislodged from the greater trochanter and located in the acetabulum. The non-absorbable suture anchor was grasped with a needle holder, and the non-absorbable suture at the tail of the anchor was cut. The joint cavity was irrigated with a large amount of sterile saline and dilute iodophor solution. After manual reduction of the left artificial hip joint, the joint capsule around the left hip joint was securely sutured, and the external rotator muscles were sutured posteriorly to the greater trochanter. C-arm fluoroscopy confirmed that the left artificial femoral head had been reduced into the left acetabulum (Figure 3).

Figure 3 | Anteroposterior pelvic X-ray showing hip joint reduction after anchor removal.

The affected hip showed good mobility without dislocation, and both lower limbs were essentially equal in length. The incision was repeatedly irrigated with dilute iodophor and saline, surgical instruments were counted, and the incision was closed layer by layer with 0# sutures for the gluteus maximus fascia, subcutaneous tissue, and skin. The incision was dressed with sterile gauze. The surgery was successful, and the patient was returned to the ward in a supine position with the left lower limb abducted and externally rotated. After this surgery, the hip dislocation caused by the anchor falling into the acetabulum was resolved, and the patient's hip pain symptoms were significantly relieved.

3. Discussion

In this case, the patient underwent manual reduction of left hip dislocation following dislocation after left artificial femoral head replacement surgery. During the procedure, the suture anchor fell into the acetabulum, causing hip dislocation and pain. The mechanism of suture anchor displacement may primarily involve biomechanical imbalance at the bone-anchor interface, dynamic loading of soft tissues, and technical operative defects. Osteoporosis (T-score $\leq$ -3.2) significantly reduces the cortical bone's

grip on the anchor, decreasing its pull-out strength by 30%-50% compared to normal bone, and postoperative micromotion can lead to progressive loosening [5]. Additionally, dynamic traction from the external rotator muscles (such as the obturator internus and piriformis) generates shear stress, accelerating anchor loosening [6]. Intraoperative deviations in anchor placement angle and lack of bone cement reinforcement further weaken fixation strength [7, 8], while early postoperative overactivity increases tension in the external rotator muscles, promoting anchor displacement and fixation failure [9]. Once the anchor falls into the acetabulum, it acts as a "third body," hindering joint congruence, increasing contact stress, and inducing dislocation. It also activates synovial inflammatory responses (such as IL-6 and TNF-α release) through mechanical wear and stimulates subchondral nerve endings, exacerbating pain [10, 11]. The loss of the external rotator muscle anchor point leads to soft tissue tension imbalance, increasing the risk of recurrent dislocation [12]. Clinical intervention strategies include: prioritizing bone cement-enhanced anchors or suture bone tunnel techniques for osteoporotic patients [8, 13], ensuring precise anchor placement with intraoperative C-arm monitoring; precise localization of dislocations using CT three-dimensional reconstruction, with primary surgery to remove foreign bodies and repair soft tissues [14]; strict immobilization and limitation of hip joint activity for 6 weeks postoperatively, with gradual initiation of gluteus medius isometric contraction training starting from the third week to restore dynamic stability [15]. These clinical intervention strategies optimize bone-implant interface stability, reconstruct joint biomechanical balance, and control inflammatory cascades, effectively achieving anatomical repair and functional recovery.

4. Conclusion

This case highlights the need for clinicians to pay close attention to the use of suture anchors in hip joint surgeries. First, during the surgical procedure, careful selection of anchor type, optimization of fixation position, and implantation depth are essential to reduce postoperative complication risks. Second, postoperative management should include systematic follow-up monitoring protocols, including strict immobilization measures and regular imaging assessments, to enable early identification and management of potential complications. From a clinical practice perspective, these measures help improve surgical success rates and patient outcomes. Furthermore, the diagnostic and treatment experience from this case provides critical evidence for standardizing complex hip revision surgeries and preventing complications, offering significant clinical value for enhancing the long-term efficacy of artificial joint replacements.

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Declarations

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of the 940th Hospital of the Joint Logistics Support Force of the Chinese People's Liberation Army. We confirm that this study was conducted in accordance with the 1964 Declaration of Helsinki and its subsequent amendments. Any images or data that may identify individuals in this article have been published with the written consent of the relevant individuals, who agreed to their publication in this article.

Competing Interests: The authors declare that they have no competing interests.\

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