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Case Report

Treatment of Intrapelvic Cup Migration *via.* a Combined Simultaneous Ilioinguinal and Lateral Approach

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Abstract

Severe destruction of the periacetabular pelvic bone may lead to intrapelvic migration of the acetabular component of a Total Hip Arthroplasty (THA) beyond the ilio-ischial line. To safely remove an intrapelvic implant, a combined simultaneous ilioinguinal and lateral approach is used in this case.

Keywords: Intrapelvic cup migration; Total hip arthroplasty; Intra-pelvic structures

Introduction

Severe destruction of the peri-acetabular pelvic bone may lead to intrapelvic migration of the acetabular component of a Total Hip Arthroplasty (THA) beyond the ilio-ischial line. The socket may damage other intra-pelvic structures or can become entrapped between the iliac vessels.

To safely remove an intrapelvic implant, several principles must be respected: identification of potential risks with a thorough preoperative workup, preoperative planning of a surgical strategy for the removal of protruding hardware without injuring noble anatomical structures, preserving muscle and bone stock and pelvic anatomy reconstruction. The common iliac vessels, ureter, bladder, rectum and uterus may bead jacent or even adherent to the prosthesis and its extraction through the defect in the medial wall of the acetabulum can lead to uncontrollable bleeding [1] or damage to the pelvic organs [2]. Rotation of the cup and proximal migration of the femoral component may result in the head of the femoral prosthesis becoming 'locked' in the cup, making dislocation impossible. Head et al, [3] reported one case and Eftekhar and Nercessian [4] four cases in which a retro peritoneal approach was used for removal of an intrapelvic cup or cement mass. The latter authors used the Rutherford Morrison approach which gave direct access for the assessment of the relationship of the prosthesis to the pelvic vessels and organs. We have used a combined simultaneous ilioinguinal and lateral approach.

Case Presentation

A 81-year-old woman presented to our department in May 2016 with increasing pain in the right hip joint, a limp and inability to walk. She had total hip arthroplasty in 2015 (diagnosis leading to primary arthroplasty was osteoarthritis secondary to developmental hip dysplasia).

The patient described pain in the right buttock and in the right inguinal area increasing with active and passive movements. At physical examination, an antalgic gait and a flexion contracture of the right hip of 15 degrees were observed. Maximum flexion of the hip was 60 degrees with minimal internal and external rotation. Leg length discrepancy was present; the affected right side had become shortened by 2.5 cm. Inflammatory blood markers were all within normal limits.

Radiographs (Figure 1) and angio-CT Scan (Figures 2 and 3) showed loosening of the acetabular component of the prosthesis with intrapelvic migration and revealed a type IIIB acetabular defect according to the Paprosky classification with a break in Kohler line [5].

A combined simultaneous ilioinguinal and lateral approach was used.

A skin incision was made parallel and just distal to the subcutaneous border of the anterior half of the iliac crest extending anteriorly to the midpoint of the inguinal ligament (Figure 4). The periosteum was incised along the iliac crest releasing the fibers of the external oblique, the internal oblique and the transversus abdominus muscles. Care

Figure 1: Preoperative radiograph showing the superomedial migration of the acetabulum and a break in the Kohler line.

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was taken to identify and protect the lateral cutaneous nerve of the thigh. The edges of the iliopsoas muscle are then located and isolated to spare the femoral nerve. The external iliac vessels must then be isolated. The muscle belly of iliacus was then elevated subperiosteally from the inner table of the ilium. With medial retraction of the iliopsoas muscle the cup came into view (Figure 5). The prosthesis was surrounded by a thick layer of fibrous tissue. The plane between the cup and this fibrous membrane was identified and careful dissection was performed leaving this layer intact. The cup was removed and several samples were taken during the surgical procedure for bacterial culture (they resulted negative for infection). The hip was approached through a separate lateral incision for the completion of the revision procedure. The femoral component was found to be stable with the impossibility to remove the modular neck or the head. After lavage of the acetabulum, a morselized allograft, obtained from two fresh-frozen tissue bank femoral head allografts, was impacted with the use of hemispherical impactors to fill the bone defects. Graft morsellization was performed with a bone mill producing fragments of 6 mm diameter. The bone was then fat-reduced to improve the shear strength of compacted allograft [6,7].

The appropriate-sized Kerboull shell for the defect was chosen (54 mm) and implanted, ensuring that the inferior hook was under the inferior acetabular margin. Five screws were placed in the ring. The cup was cemented directly onto the acetabular ring and graft with appropriate anteversion and inclination (Figure 6).

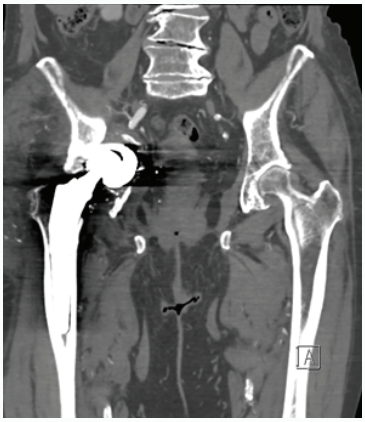

Figure 2: Angio-CT Scan showed loosening of the acetabular component with intrapelvic migration and acetabular defect (Paprosky type IIIB).

Figure 3: Angio-CT Scan shows narrow contact between the acetabular component and the iliac vessels.

Figure 4: Surgical incisions of a combined simultaneous ilioinguinal and lateral approach.

Figure 5: Medial retraction of the iliopsoas muscle brings the cup or cement mass into view.

Figure 6: Postoperative anterior-posterior radiographs showing the reconstruction of the acetabulum with morselized allograft and the acetabular ring.

Discussion

Managing THA loosening with pelvic migration requires complete preoperative clinical assessment. The full clinical workup includes a complete radiographic workup, an angio-CT Scan, as well as a workup for inflammatory diseases.

All intrapelvic migrations of arthroplasty material do not systematically require a sub peritoneal approach. One must analyze whether a bone barrier, an intrapelvic foreign object, or an abnormality of the vascular trajectory is present before choosing the approach.

Furthermore, a rotated ace tabular component combined with proximal migration of the femur may 'lock' the prosthetic head and an attempted dislocation can then cause a fracture to the femur or to the acetabular wall. Extraction of the cup from within the pelvis frees the prosthetic head and allows safe mobilization of the femur.

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