



Total Hip Replacement via a Combined Intra and Extra-Pelvic Approach causing Dysuria and Bladder Penetration

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Total hip replacement 40 years after its inception remains one of the most successful treatments in the surgical armamentarium. However, as in any other procedure, complications can occur. An unusual complication is intra-pelvic migration of the acetabular cup. Such migration can create several problems, including bladder and intestinal injury, blood vessel injury and infection of the prosthesis. Previous authors have suggested a staged procedure, i.e., cup removal via a retroperitoneal approach [1,2]. Several weeks later, revision of the prosthesis is performed via a lateral extra-pelvic approach.

The current report describes removal of the cup, treatment of bladder injury, medial wall reconstruction and prosthetic reconstruction using a combined intra- and extra-pelvic approach, performed as a one-stage procedure.

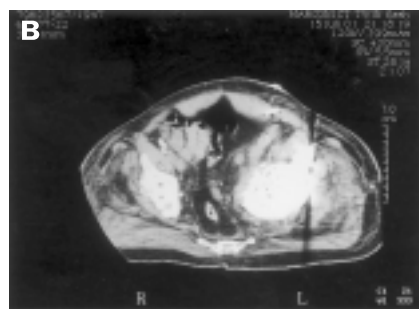
Patient Description

A 54 year old patient underwent bilateral total hip replacement in 1984 using a

cementless prosthesis (isoelastic femoral stem combined with an RM cementless cup) [3]. Sixteen years later, due to loosening of the cup with formation of a medial wall defect, an arthroplasty revision procedure had been performed using the Bicon-tact revision stem (Aesculap AEG, Tuttlingen, Germany) [4]. This system consists of a long interlocked stem and a cementless plasma-coated cup. Six months later the cup migrated through the medial wall defect into the pelvis [Figure A]. The patient complained of pain and limb shortening and was referred to our hospital. On admission he could not stand on the involved leg and had a Harris hip score of 21 points. He complained of dysuria as well as urinary frequency. Urinalysis demonstrated microhematuria without white blood cells or bacteria. Erythrocyte sedimentation rate and C reactive protein levels were normal. Computed tomography revealed displacement of the rectum and bladder by a bone mass covering the displaced plasma-coated titanium cup

[Figure B]. Preoperative angiography demonstrated that the common iliac artery adhered to the newly formed intrapelvic bone shell and was displaced medially and anteriorly by it.

The patient was placed supine and his pelvis rotated 45 degrees to allow simultaneous exposure of the retroperitoneum and the hip joint. The first part of the procedure was performed via a retroperitoneal approach employing an ilio-inguinal skin incision. The common iliac artery was dissected out of the callus-like tissue and mobilized away from the cup. The bladder wall was attached to the callus-like tissue and a small perforation was noted and repaired. The center part of the medial wall consisted of fibrous tissue that was removed in order to expose the metal cup. At this stage an antero-lateral approach to the hip joint was undertaken. The stem could not be dislocated due to penetration into the pelvis. As the femoral stem was well fixed, the acetabular dome was removed piecemeal to allow dislocation of



[A] Radiograph demonstrating intra-pelvic migration of an acetabular cup (left hip) (PA projection of the pelvis). **[B]** CT scan of the pelvis demonstrating adherence of the bladder to the ossified intrapelvic mass. **[C]** Postoperative cystogram demonstrating adherence of the urinary bladder to the ossified intra-pelvic mass.

the prosthesis. Simultaneous manipulation of the prosthesis from both sides of the ilium allowed its relocation out of the pelvis and into the acetabulum. The medial wall cavity was filled by morselized allograft and a reconstruction cage was used to bridge the acetabulum from the ilium to the ischium. The retroperitoneal incision was closed over drains after a cystogram ruled-out urine leakage [Figure C]. The procedure was completed via the lateral approach by cementation of a polyethylene cup into the cage. Postoperatively a Foley catheter was left in place for 14 days to allow healing of the bladder perforation.

Radiographs taken after 3 months of partial weight-bearing indicated reconstruction of the medial acetabular wall. Full weight-bearing was allowed. At 6 months follow-up the patient is pain-free and has an 89-point Harris hip score.

Comment

The removal of intra-pelvic components is a major challenge in total hip revision surgery. The major problems as observed in our case are the displacement of intra-pelvic organs [1] and possible formation of pelvic organ injuries. Such injuries were described as early complications leading to gross hematuria with a benign course, or as

late complications sometimes with a fatal outcome [5]. Bladder perforation in cases of intra-pelvic migration of acetabular cups might occur as pressure erosion of the bladder. The adhesions around the bladder might lead to a contained perforation. In such a case the perforation can only be detected during intra-pelvic dissection. In our case, ballooning of the medial acetabular wall occurred, leading to encasement of the iliac vessels in callus tissue. Angiography appears to be a prerequisite to surgery in such instances. Due to the presence of large amounts of metal in the prosthesis, less invasive imaging methods such as magnetic resonance angiography or contrast-enhanced CT are inadequate. Though not performed in this case, the authors recommend routine performance of cystography prior to the procedure. As can be seen on the postoperative cystography, adhesions of the bladder wall to the ballooned medial cortex were extensive and it is possible that a preoperative cystography would have revealed the perforation encountered intraoperatively.

Reconstruction following intra-pelvic protrusion has been recommended as a two-stage procedure to reduce the risk of infection [2]. A two-stage procedure in this instance indeed lowers the infection risk,

but it would have required re-dissection of the vessels to separate them from the medial pelvic wall. Due to the adhesions encasing the vessels it appeared to be appropriate to avoid re-dissection by performing a single stage procedure.

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