A TECHNIQUE FOR REMOVING AN INTRAPELVIC ACETABULAR CUP

P. GRIGORIS, P. ROBERTS, D. J. W. McMINN, R. N. VILLAR

From the Royal Orthopaedic Hospital, Birmingham and Addenbrooke's Hospital, Cambridge, England

We describe a simple, retroperitoneal approach for the removal of acetabular components that have migrated into the pelvis. The dense fibrous tissue layer which surrounds the implant protects the iliac vessels during removal of the cup by this method.

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Removal of an acetabular prosthesis that has migrated into the pelvis can be hazardous. The common iliac vessels, ureter, bladder, rectum and uterus may be adjacent or even adherent to the prosthesis and its extraction through the defect in the medial wall of the acetabulum can lead to uncontrollable bleeding (Slater, Edge and Salman 1989) or damage to the pelvic organs (Roberts and Loudon 1987). 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 (1984) reported one case and Eftekhar and Nercessian (1989) four cases in which a retroperitoneal approach was used for removal of an intrapelvic cup or cement mass. The latter authors used the Rutherford Morison approach which gave direct access for the assessment of the relationship of the prosthesis to the pelvic vessels and organs.

We have used a simple, limited retroperitoneal approach which has allowed the safe removal of nine intrapelvic cups.

PATIENTS AND METHODS

There were eight men and one woman with a mean age of 64 years (32 to 78). The primary diagnosis was osteoarthritis in eight patients (two secondary to dysplasia) and rheumatoid arthritis in one. Five patients had Charnley prostheses, two Howse prostheses and in one the design was not recorded. In eight of the patients the mean interval between the primary procedure and the revision was 13.25 years (7 to 19). In the other we performed a third operation after a revision procedure with the use of an acetabular support ring eight years earlier.

In eight cases the cup had migrated medial to Köhler's line (Fig. 1) and in the other it had disintegrated but there was a large intrapelvic cement mass (Fig. 2). Fortunately, severe medial migration is rare and these nine cases represent only 3.6% of the revision hip arthroplasties carried out in our two units during the last four years.

Infection was excluded in all the patients by preoperative aspiration, scintigraphy, and measurement of the ESR and C-reactive protein. One-stage reconstruction was performed in all.

Angiography was used in five of our cases to define the relationship of the prosthesis to the pelvic vessels and organs. The interpretation of angiograms can, however, be difficult because it is impossible to obtain true lateral views. An acetabular prosthesis that appears to be closely related to the vessels on the anteroposterior view may be in a different transverse plane. Angiograms are, however, useful for excluding false aneurysms. Recently, we have used MRI and have been impressed with the information that this provides about the course of the vessels in relation to the acetabular prosthesis.

Operative technique. The patient lies on the unaffected

P. Grigoris, MD, PhD, Research Fellow
P. Roberts, FRCS, Senior Orthopaedic Registrar
D. J. W. McMinn, FRCS, Consultant Orthopaedic Surgeon
Royal Orthopaedic Hospital, Woodlands, Bristol Road South, Northfield, Birmingham B31 2AP, UK.

R. N. Villar, FRCS, Consultant Orthopaedic Surgeon
Addenbrooke's Hospital, Hills Road, Cambridge CB2 2QQ, UK.

Correspondence should be sent to Dr P. Grigoris at Joint Replacement Institute, 2400 S. Flower Street, Los Angeles, CA 90007, USA.

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Fig. 1a

Fig. 1b

Intrapelvic migration of (a) a Charnley prosthesis and (b) a Howse prosthesis and support ring.

Fig. 2

Intrapelvic cement mass with disintegration of the acetabular cup.

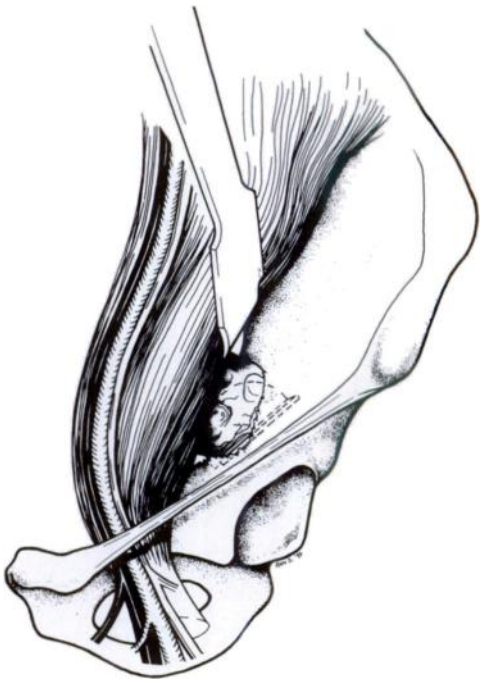

Fig. 3

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

side, rotated 45° to allow access to the abdomen. A single window in the drapes exposes the iliac crest and the proximal femur.

A skin incision is 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. The periosteum is incised along the iliac crest releasing the fibres of the external oblique, the internal oblique and the transversus abdominus muscles. The lateral end of the inguinal ligament can be reflected in continuity with the abdominal muscles if necessary. Care is taken to identify and protect the lateral cutaneous nerve of the thigh. The muscle belly of iliacus is then elevated subperiosteally from the inner table of the ilium. With medial retraction of the iliopsoas muscle the cup comes into view (Fig. 3). When the cup has migrated proximally as well as medially, access to it is easy. If the migration is purely medial a more extensive exposure is necessary.

The prosthesis is invariably surrounded by a thick layer of fibrous tissue. The plane between the cup and this fibrous membrane is identified and careful dissection is performed leaving this layer intact. The cup and surrounding cement can then be removed either whole or piecemeal depending on their size and position.

The hip may then be approached through a separate lateral incision or by extending the iliac incision to give an anterior approach for the completion of the revision procedure. A separate incision was used in five of our patients and an anterior extension in four. A variety of prostheses was used for acetabular reconstruction and bone graft was utilised in seven patients.

There is a risk of paralytic ileus in the postoperative period. It is therefore prudent to introduce oral fluids gradually until intestinal function has returned to normal.

RESULTS

There were no complications associated with the removal of the eight intrapelvic cups which were surrounded by thick fibrous capsules. In the one patient, however, in whom this approach was used mainly for the removal of cement introduced into the pelvis at the time of primary surgery, the fibrous layer was less well developed and brisk venous haemorrhage was encountered. This was controlled by direct suture of the bleeding point without the need for exploration of the pelvic vessels.

DISCUSSION

The limited retroperitoneal approach that we have described is familiar to orthopaedic surgeons since it is similar to that used for innominate osteotomy. Intrapelvic migration of an acetabular prosthesis is usually a slow process during which the cup becomes surrounded by a thick layer of fibrous tissue which separates it from the pelvic vessels and organs. Dissection in the plane between the cup and the fibrous membrane allows safe removal of the cup and cement, leaving the fibrous layer intact.

This approach is not appropriate for the removal of all intrapelvic cups. If the preoperative angiograms show a false aneurysm the Rutherford Morison approach should be used and the vessels explored. A large cement mass which has extruded into the pelvis at the time of primary surgery also presents a more difficult problem because it may be directly adherent to the pelvic vessels and organs. The protective effect of the thick fibrous layer is absent and there is a greater risk of damage to the vessels. The Rutherford Morison approach may, again, be advisable. If, using the limited retroperitoneal approach, haemorrhage is encountered the incision can be extended and the approach converted to the Rutherford Morison, with mobilisation of the peritoneum off the iliopsoas fascia allowing direct access to the external iliac vessels and pelvic organs.

We have found it best to remove the intrapelvic cup before approaching the femur. A rotated acetabular component combined with proximal migration of the femur may 'lock' the prosthetic head and attempted dislocation can then cause fracture of the femur or of the acetabular wall. Extraction of the cup from within the pelvis frees the prosthetic head and allows safe mobilisation of the femur.

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