RECURRENT DISLOCATION AFTER TOTAL HIP REPLACEMENT

TREATMENT BY FIXING AN ADDITIONAL SECTOR TO THE ACETABULAR COMPONENT

S. OLERUD, G. KARLSTRÖM

From the University Hospital, Uppsala

Six patients with recurrent dislocation after total hip replacement have been treated by fixing an additional sector to the acetabular component. Muscle imbalance or unsatisfactory positioning of the prosthetic components (or both) had caused the dislocations in five patients. In the sixth, a schizophrenic, the dislocations were due to the positions in which the patient placed his limb.

At operation a sector was cut from another acetabular prosthesis and screwed on to the previously inserted acetabular component in such a position as to prevent further dislocation. This method has been successful and seems a simple alternative to exchange arthroplasty.

After total hip replacement recurrent dislocation is a serious and embarrassing complication. The reported incidence has varied from less than 1% to 8% (Bergström et al. 1973; Charnley and Cupic 1973; Eftekhar and Stinchfield 1973; Eftekhar et al. 1973; Evanski, Waugh and Orofino 1973; Harris 1973; Lazansky 1973; Murray 1973; Nicholson 1973; Coventry et al. 1974; Fraser and Wroblewski 1981; Khan, Brakenbury and Reynolds 1981; Salvati et al. 1981; Williams, Gottesman and Mallory 1982; Dorr et al. 1983).

As predisposing factors for these dislocations, different authors have mentioned previous hip surgery, previous hip fractures (Carlsson and Gentz 1977; Lewinnek et al. 1978; Woo and Morrey 1982), a posterior incision (Woo and Morrey 1982), unfavourable positioning of the prosthetic components (Lewinnek et al. 1978; Khan, Brakenbury and Reynolds 1981; Woo and Morrey 1982; Dorr et al. 1983), and mental and neurological disturbances (Khan, Brakenbury and Reynolds 1981).

In this report we describe a relatively simple method for treating recurrent dislocation after total hip replacement.

MATERIAL AND METHODS

In six patients with recurrent dislocation after total hip replacement, the containment of the acetabular prosthesis was improved by adding a sector to that component (Table I). Four of the patients were women and two were men. Their mean age was 62 years (range 45 to 82). All patients had had fractures in the region of the hip prior to the hip replacement. There were three acetabular fractures and three femoral (one fracture of the femoral neck, one trochanteric fracture and one fracture at the proximal end of the femoral shaft).

One patient had had only one previous operation in the hip region (Case 6), the others had been operated on between two and eight times. In two patients imbalance of the soft tissues contributed to the dislocation and in four patients it was due to unsatisfactory positioning of the prosthetic components. One patient, a chronic schizophrenic (Case 5), had neither soft-tissue imbalance nor erroneously positioned components, but could not be prevented from placing the limb in positions which led to dislocation. In three patients the hip dislocated in the anterior direction and in two patients posteriorly. The schizophrenic patient had first anterior, then posterior dislocations.

In one of the patients a 32 mm Müller straight-stem prosthesis had been used. In the other five patients the acetabular component was that used with the 22 mm Charnley type of prosthesis; in three of the cases with these sockets the femoral component was the 22 mm Müller prosthesis used for congenital hip dislocation, while in the other two a Charnley femoral prosthesis was used. Thus, there was no mismatch in size of the acetabular component relative to the prosthetic femoral head. In no patient were there any radiographic signs of loosening of the prosthetic components.

Before operation the dislocated hips were examined with an image intensifier under general anaesthesia, either after reduction or in the same session as reduction. At this examination it could be established whether the hip was dislocating in an anterior or posterior direction. Operation. A lateral incision was used, and in four patients a trochanteric osteotomy was performed. When the edges of the acetabular component had been freed by
Table 1. Details of the patients and their treatment

<table>
<thead>
<tr>
<th>Case number</th>
<th>Age (years) and sex</th>
<th>Previous diseases, injuries and surgery</th>
<th>Number of previous operations</th>
<th>Causes of dislocation</th>
<th>Dislocation</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50 F</td>
<td>Fracture dislocation of acetabulum 1974; necrosis of femoral head, THR 1976; recurrent dislocations, two rearthroplasties; femoral shaft fracture, ORIF 1977; refractured femur, ORIF, non-union 1981; rearthroplasty and femoral nailing 1983</td>
<td>8</td>
<td>Excessive neck resection and error in position of acetabular component</td>
<td>Anterior</td>
<td>Socket augmentation plus trochanter transplantation</td>
</tr>
<tr>
<td>2</td>
<td>50 M</td>
<td>Acetabular fracture, ORIF, postoperative osteitis with bone loss 1980; 4 interventions for infection; THR for necrosis of femoral head 1982</td>
<td>6</td>
<td>Error in position of acetabular component</td>
<td>Posterior</td>
<td>Socket augmentation</td>
</tr>
<tr>
<td>3</td>
<td>82 F</td>
<td>THR for OA, intraoperative penetration of femur, 1978; femoral fracture; ORIF and rearthroplasty with long stem femoral component 1979; femoral non-union, fracture of prosthesis, rearthroplasty and intramedullary nailing 1983</td>
<td>3</td>
<td>Error in position of femoral component</td>
<td>Posterior</td>
<td>Socket augmentation</td>
</tr>
<tr>
<td>4</td>
<td>45 F</td>
<td>Fracture dislocation of acetabulum 1982; secondary OA, THR 1983</td>
<td>2</td>
<td>Error in position of acetabular component</td>
<td>Anterior</td>
<td>Socket augmentation</td>
</tr>
<tr>
<td>5</td>
<td>70 F</td>
<td>Chronic schizophrenia; fractured femoral neck, failed internal fixation followed by THR, 1983</td>
<td>2</td>
<td>Limb placed in unusual positions</td>
<td>Anterior followed by posterior</td>
<td>Socket augmentation (2) plus trochanter transplantation</td>
</tr>
<tr>
<td>6</td>
<td>75 M</td>
<td>RA pertrochanteric femoral fracture, ORIF and THR 1983</td>
<td>1</td>
<td>Soft-tissue imbalance</td>
<td>Anterior</td>
<td>Socket augmentation plus trochanter transplantation</td>
</tr>
</tbody>
</table>

THR, total hip replacement
ORIF, open reduction and internal fixation
OA, osteoarthritis
RA, rheumatoid arthritis

dissection, the direction of the dislocation was verified. It was confirmed that none of the prosthetic components had loosened.

A sector was then cut out of a new acetabular prosthesis with a saw (Fig. 1). This piece was placed on the anterior or posterior wall of the previously inserted prosthesis and fixed with two or three 3.5 mm cortical screws (Fig. 2). When it was confirmed that the risk of further dislocation had been eliminated, the trochanter was re-attached; in three cases it was also transplanted distally.

After the operation immediate mobilisation and full weight-bearing were permitted. At subsequent follow-up the patients were examined both clinically and radiographically (Figs 3–7).

RESULTS
There were no complications in the postoperative period. The patients stayed in hospital an average of 10 days (range 3 to 18). No redislocations occurred during the follow-up period of nine months to three years. However, one patient (Case 5), who had previously had an
Figure 3—Posterior dislocation of a Müller hip arthroplasty after previous acetabular fracture (Case 2). Figures 4 and 5—The arthroplasty is stable after addition of a sector to the posterior wall of the acetabular component. Trochanteric osteotomy also was performed.

Figure 6—Anterior dislocation of a Charnley hip arthroplasty after previous acetabular fracture (Case 4). Figure 7—The hip is stable after addition of a sector to the anterior wall of the acetabular component.
anterior dislocation treated by an anterior addition, returned after one month with a posterior dislocation: a sector was therefore also added posteriorly and since then her hip has been stable.

At follow-up all patients were painfree and felt more confident of their hips. Their walking capacity was at least the same as before the last operation. There has been no loss of range of movement. Radiographically there has been no change in the position of the screws, nor were there any signs of loosening of the acetabular component.

**DISCUSSION**

Dislocations following total hip replacement are not very common; however, the risk seems to increase considerably when the primary arthroplasty has been preceded by a hip fracture (Lewinnek et al. 1978; Williams et al. 1982; Woo and Morrey 1982). All of our six patients had had previous fractures, and it is possible that these fractures contributed to their dislocations. In particular, previous acetabular fractures followed by hip replacement seem prone to dislocation. Residual deformities or defects in the acetabular wall can make it very difficult to place an acetabular prosthesis in the correct position. In addition to incorrect positioning of prosthetic components, loosening of the trochanter and excessive resection of the femoral neck contribute to soft-tissue imbalance, which may increase the risk of dislocation (Woo and Morrey 1982; Dorr et al. 1983). Another cause may be impingement of the greater or lesser trochanter on the pelvis. Khan et al. (1981) also found that mental and neurological disturbances predisposed to dislocation.

With a single dislocation, especially an early one, treatment by closed reduction followed by a period of relative immobilisation with an abduction splint, traction, plaster cast or brace is often sufficient (Carlsson and Gentz 1977; Woo and Morrey 1982; Dorr et al. 1983). Recurrent dislocations, however, generally require operative treatment. The usual plan is to remove the unfavourably positioned components and replace them correctly, then to restore the soft-tissue balance by distal transplantation of the trochanter (Lewinnek et al. 1978; Fraser and Wroblewski 1981; Khan, Brakenbury and Reynolds 1981; Dorr et al. 1983). To reduce the risk of dislocation after revision, immobilisation of the hip by traction, a plaster cast or a brace for three weeks to three months has been proposed (Coventry et al. 1974; Williams et al. 1982). Despite such treatment (which is often uncomfortable for the patient and difficult for the surgeon), the results in fairly large series do not seem to be particularly satisfactory. A persistent proneness to dislocation has been reported in 20–30% of patients (Fraser and Wroblewski 1981; Khan, Brakenbury and Reynolds 1981; Woo and Morrey 1982).

The follow-up period for most of our patients is rather short. However, the risk of loosening or breakage of the screws or of the acetabular additions should be minimal as they will be subjected to little stress.

In conclusion, our technique provides a simple method of treating recurrent dislocation following total hip replacement. It seems particularly attractive for patients who have had several previous hip operations, since the risk of other complications—apart from dislocation—also increases after revision arthroplasty because of this a Girdlestone procedure is sometimes preferred in such patients. Our method is less complicated, and the postoperative period requires little immobilisation and no plaster or splint; moreover it preserves the hip.

**REFERENCES**


