HIP REPLACEMENT FOR ADULTS WITH UNREDUCED CONGENITAL DISLOCATION

A NEW SURGICAL TECHNIQUE

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Total hip replacement for adults with unreduced congenital dislocation presents a difficult problem because soft-tissue contractures usually prevent sitting at the normal anatomical level. Extensive soft-tissue division or a high-level acetabulum leads to reduced function and poor fixation of the components.

We describe a new technique for hip replacement in such cases. The shortened abductors and flexors are released proximally and excision of the upper third of the ilium allows them to be repaired without tension, while providing bone graft to reconstruct the acetabular roof. We report 12 such replacements in 10 patients with good results and few early complications.

Considerable problems of treatment are posed by an adult with severe pain in a hip which has been dislocated since birth. In 1973 Charnley and Feagin reported that "the policy in this centre is not to attempt the operational reconstruction of late cases of unreduced congenital dislocation of the hip" and continued, "even if the new acetabulum could be fashioned in the correct position it is doubtful whether the shortened abductor muscles could be brought down to the correct level. Anything less than perfect restoration of the abductor mechanism ... means that the patient could be submitted to a dangerous operation without benefitting."

To gain maximum bone cover for the new cup it should be placed at the site of the true acetabulum, as recommended by Harris, Crothers and Oh (1977). However, if this is done, reduction of the hip will be impossible unless the shortened abductors and flexors can be released. If the greater trochanter is released by osteotomy it may not be possible to reattach it successfully (Fredin and Unander-Scharin 1980) and power of abduction will be lost. It may be necessary to shorten the femur by excising bone from its upper end (Dunn and Hess 1976; Harris et al. 1977), but the femoral component is then sited low in the shaft of the femur and the leg is short.

Experience of pelvic osteotomy in children with hip dysplasia (Wilkinson 1985) led the senior author to apply a similar technique to hip replacement in adults. This allows replacement of the hip at true acetabular level, with maintenance of abductor power and restoration of normal leg length.

We report the use of the new technique for 12 total hip replacements in 10 patients.

PATIENTS AND METHODS

Details of the 10 patients are given in Table I. This also shows an average follow-up of 23 months. Two hips (Patients 3 and 4) showed severe subluxation (Grade 3; Crowe, Mani and Ranawat 1979) and the other 10 were completely dislocated (Grade 4).

Technique of operation. A Salter-type of incision is made over the iliac crest, and the hip abductors and flexors are detached from the ilium by subperiosteal dissection (Salter 1961). This muscle release is carried posteriorly as far as possible, which gives good access to the hip joint and also exposes most of the upper ilium. The upper third of this bone is excised to provide a graft and to allow resuture of the released muscles without tension (Fig. 1). The capsule of the hip is cleared of muscle and then excised and the femoral head is removed, retaining as much of the calcar as possible to support the prosthesis.

The true acetabulum is then identified by direct palpation of the iliac bone between finger and thumb,
Table I. Details of 12 hip replacements in 10 patients with unreduced congenital dislocation

<table>
<thead>
<tr>
<th>Case</th>
<th>Sex</th>
<th>Age at operation</th>
<th>Side</th>
<th>Prosthesis</th>
<th>Follow up (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>55</td>
<td>Right</td>
<td>Normal size</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>57</td>
<td>Left</td>
<td>Normal size Metal-backed cup</td>
<td>52</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>36</td>
<td>Left</td>
<td>Normal size Müller acetabular reinforcement ring</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>46</td>
<td>Right</td>
<td>Normal size Müller acetabular reinforcement ring</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>44</td>
<td>Left</td>
<td>Normal size CDH-type Howmedica acetabular reinforcement mesh</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45</td>
<td>Right</td>
<td>Normal size CDH-type</td>
<td>17</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>46</td>
<td>Left</td>
<td>CDH-type</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>47</td>
<td>Right</td>
<td>CDH-type</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>54</td>
<td>Left</td>
<td>Normal size Metal-backed cup</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>29</td>
<td>Right</td>
<td>CDH-type</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>66</td>
<td>Right</td>
<td>CDH-type</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>51</td>
<td>Left</td>
<td>Normal size Metal-backed cup</td>
<td>6</td>
</tr>
</tbody>
</table>

Fig. 1 - The bone above the broken line is excised. Figure 2 - Diagram to show the muscle release (which is later repaired over the cut edge of the ilium) and the bone graft above the acetabulum.

and is cleared of soft tissue and deepened with gouges and reamers. Even at the correct level, superior cover for the acetabular cup is usually insufficient and requires augmentation with a corticocancellous graft. This is provided by part of the excised iliac crest which is screwed to the outer wall of the pelvis to improve bony cover before the cup is cemented into position (Fig. 2).

The fitting of the femoral component requires great care, with due allowance for the narrow medullary cavity. The excessive anteverision of the femoral neck is corrected in relation to the axis of flexion of the knee by placing the prosthesis eccentrically in the base of the femoral neck. This rotatory correction also brings the greater trochanter forward to a correct position in relation to the femoral head.

The prosthetic joint can then be reduced without undue tension because iliacus, tensor fascia lata and the glutei have been released from the pelvis. These muscles slide inferiorly with the femur, while the relatively long bellies of psoas, the adductors and the hamstrings are easily stretched to their new lengths. The abductors are then resutured to the iliacus over the osteotomised edge.
of the ilium. This repair at normal tension provides the necessary restoration of abductor power, so that maximal biomechanical function is provided for the newly aligned hip and the increased leg length.

Postoperatively the patient remains in bed with an abduction pillow between the legs for five to seven days. After this walking with the aid of crutches is encouraged and a course of hydrotherapy is started. Patients are normally discharged from hospital two to three weeks after the operation but continue to use two crutches for 12 weeks.

RESULTS

In all 12 hips a Müller design of prosthetic hip was used; CDH-type components were necessary in five hips. Acetabular reinforcement rings of Müller pattern were used to support the bone graft in two patients and a metal-backed cup was used in three other patients. There were significant complications in only four cases. These were:

1. Two cases of quadriceps weakness due to neurapraxia of the femoral nerve; both these have subsequently recovered.
2. One minor fracture in the upper femur which did not necessitate any special treatment or extension of hospital stay.
3. In one case, immediate postoperative dislocation was reduced and became stable.

The full recovery of muscle power took up to six months but by then the Trendelenburg sign had become negative in all 12 hips. Good pain relief was achieved and leg length had been improved. All 10 patients had an improved gait and better exercise tolerance. To date, there have been no intermediate complications and there is no evidence of loosening of the components.
ILLUSTRATIVE CASE REPORTS

Case 1. The first patient treated by this technique presented at the age of 55 years with a severely painful, unreduced CDH (Fig. 3). Normal-sized components were used and five years after operation (Fig. 4) she remains free from pain.

Case 6. A woman of 46 had pain in both hips secondary to unreduced CDH (Fig. 5). Both hips were replaced, using CDH components, with a recovery period of five months between operations on the left and right sides (Fig. 6). During this period she needed a shoe-raise on the non-operated side to protect the replaced hip in the lengthened leg from undue stress.

Case 4. A 46-year-old man presented with painful Grade 3 subluxation of the right hip (Fig. 7). He had a hip replacement using a normal-sized prosthesis. The acetabulum was large enough to allow the use of a reinforcement ring to support the cup and fix the bone graft (Fig. 8).

DISCUSSION

This operation is technically demanding and should be performed only when symptoms are severe and by surgeons experienced in the techniques of both pelvic osteotomy and total hip replacement. It is essential that a wide range of prostheses are available because it may be difficult to fit them into the hypoplastic bones of these patients. However, given adequate experience, equipment and technical support, the operation has been shown to provide very rewarding results for this small group of patients, allowing them to share the considerable benefit already available to most other patients with painful degeneration of the hip.

REFERENCES


