THE RESULTS OF REINSERTION OF A TOTAL HIP PROSTHESIS AFTER SEPSIS

GORDON A. HUNTER

From the Sunnybrook Medical Centre, Toronto

Sixty-five total hip arthroplasties were reinserted after sepsis around the hip, positive cultures being obtained from fifty-six. Although 65 per cent of patients still have their implant in position, only sixteen of sixty-five (25 per cent) show an excellent or good result on a Harris rating. Twenty-three of sixty-five (35 per cent) subsequently required an excision arthroplasty. The indications and contraindications for this procedure are given.

Total hip replacement is nowadays accepted as the operation of choice for arthritic conditions of the hip in the elderly patient. The most serious complication is deep infection; the natural history of this problem has previously been reported (Hunter and Dandy 1977).

Hori et al. (1978) reported that approximately 80,000 total hip replacements were carried out in the

Table I. Results of revision of total hip replacement after sepsis

<table>
<thead>
<tr>
<th>Author</th>
<th>Number of patients</th>
<th>Success (per cent)</th>
<th>Follow-up (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunter and Dandy (1977)</td>
<td>31</td>
<td>35</td>
<td>Minimum 6</td>
</tr>
<tr>
<td>Hunter* (1979)</td>
<td>65</td>
<td>25–65</td>
<td>Minimum 6</td>
</tr>
<tr>
<td>Murray (1978)</td>
<td>38</td>
<td>66</td>
<td>3–84</td>
</tr>
<tr>
<td>Buchholz et al. (1979)</td>
<td>684</td>
<td>71–86</td>
<td>14–168</td>
</tr>
<tr>
<td>Carlsson, Josefsson and Lindberg (1978)</td>
<td>77</td>
<td>78–90</td>
<td>6–42</td>
</tr>
<tr>
<td>Hughes et al. (1979)</td>
<td>26</td>
<td>85</td>
<td>Average 37</td>
</tr>
<tr>
<td>Wilson et al. (1974)</td>
<td>19</td>
<td>89</td>
<td>Minimum 24</td>
</tr>
<tr>
<td>Wilson, Fitzgerald and Coventry (1979)</td>
<td>51</td>
<td>88</td>
<td>Minimum 12</td>
</tr>
<tr>
<td>Lowell (1976)</td>
<td>100</td>
<td>90</td>
<td>No details</td>
</tr>
</tbody>
</table>

* This series

United States of America in 1976; assuming a low rate of infection of 1 per cent, this would mean a minimum of 800 infected hips per annum. Charnley (1970) stated that a second total hip replacement was never justified after infection of the first implant, and two years later (Charnley 1972) stated that the use of antibiotics in cement was fallacious. Buchholz and Gartmann (1972) reported on the use of Palacos with gentamicin to insert a second replacement after infection of the first. Since that time, a number of surgeons have used this procedure, with variable results (Table I). This paper presents an analysis of the results of revision after infection.

CLINICAL MATERIAL

Sepsis, defined as pus around the implant, was found in sixty-five hips, a positive culture being obtained in fifty-six. The details of revision procedures were noted, the majority being carried out in standard operating rooms without the benefit of clean air. Forty patients received systemic antibiotics for varying periods of time (ranging from two days to two years), while for sixteen patients antibiotics were mixed with the cement. A review was carried out after a minimum of six months, and the results were rated on the Harris scale (Harris 1969).

Of the sixty-five hips replaced, four had a history of septic arthritis, four had an infected hemiarthroplasty and fifty-seven had an infected total hip replacement.

RESULTS

Although 65 per cent of the patients still have their hip implant in position and may therefore be superficially rated a "success", only sixteen (25 per cent) showed an excellent or good result on a Harris rating; twenty-six (40 per cent) showed a fair or poor result, and in this group there were two patients with a draining sinus, and twenty-three (35 per cent) subsequently required an excision arthroplasty. Further analysis showed that the best results were obtained when antibiotics were mixed with the cement and when the procedure was staged (Table II), the interval of temporary excision ranging from five weeks to three years. An interval of one year enabled an assessment to be made of the healing of the
wound, pain, the erythrocyte sedimentation rate and the results of aspiration (Patel, Karchmer and Harris 1976).
The bacteriological findings at revision did not confirm the “benign” nature of infection with antibiotics. Higher doses of systemic antibiotics are possible when treating Gram-positive organisms without the risk of toxic or allergic reactions.

**CONCLUSIONS**

From a review of the literature and from this series, I would suggest that if a second total hip implant is to be considered after sepsis of the first, the problems and complications should be discussed at length with the patient and his or her relatives. By staging the procedure with an interval for assessment a second operation may be avoided.

If possible, the revision procedure should be carried out in a clean air operating room; antibiotics should be mixed with the cement unless there is a history of drug allergy. Systemic antibiotics should also be prescribed for a minimum of three to six months. When assessing the results, the surgeon must evaluate the procedure and, if possible, an independent observer should carry out the review. A scale for rating the hip is essential.

A second implant after sepsis is contraindicated when reasonable function can be obtained from excision arthroplasty; when there are persistently high erythrocyte sedimentation rates in the absence of any other systemic disease; when a draining sinus communicates with the hip joint; when the infection is due to Gram-negative or anaerobic organisms; when there is pelvic or femoral osteomyelitis or a pelvic fracture (Dandy and Theodorou 1975); or when there is loss of femoral bone stock, especially after extensive guttering or a fracture.

Staphylococcus albus but did confirm the poor results after infection with Gram-negative organisms that had been reported by Wilson, Aglietti and Salvati (1974), for these organisms are able to develop resistance to the infections.

My thanks are due to the surgeons throughout Ontario who helped in this survey by allowing their patients to be reviewed. I would particularly like to thank Dr Ian Macab for his continued support of this project, and his daughter Joceyn Macab for reviewing many of these patients. This survey was financed by the Ontario Government through a summer student project.

**REFERENCES**


Charnley, J. (1972) Personal communication.


