EXCISION ARTHROPLASTY FOR TUBERCULOUS AND PYOGENIC ARTHRITIS OF THE HIP

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Thirty patients with chronic pyogenic or tuberculous arthritis of the hip treated by Girdlestone’s excision arthroplasty were reviewed two to seven years after operation. There was marked or complete relief of pain in 29, control of infection in 27, squatting and sitting cross-legged was possible in 27, and 16 were able to stand on the operated limb. Overall results were good in 16, fair in nine, and poor in five. Tuberculous disease was not reactivated and the use of traction for 12 weeks and a weight-relieving caliper for 12 months after operation helped to reduce the shortening to an average of 3.8 centimetres. Excision arthroplasty is considered a sound operation to restore the ability to squat and sit cross-legged.

Pyogenic and tuberculous infection are common hip diseases in the developing countries. They often lead to destruction of the hip with pain, gross restriction of movement, deformity, and varying degrees of shortening. The usual treatments available are arthrodesis in a functional position or excision arthroplasty. Replacement arthroplasty is expensive and is risky in chronic infection.

The functional needs of patients in the affluent countries differ from those of the people of India and of most of the eastern hemisphere. In the West patients may accept a stiff hip in a functional position. In the East patients need to be able to squat, kneel and sit cross-legged. Many cannot afford the luxury of chairs or of a commode for toilet purposes.

Girdlestone’s excision arthroplasty is a salvage procedure and its value has been debated. This study assesses the results of excision arthroplasty for infective lesions of the hip against the background of the social customs of India.

MATERIALS AND METHODS

This series reports observations on 30 patients suffering from chronic infection of the hip who were followed up as outpatients at the University Hospital, Banaras Hindu University. These patients underwent excision arthroplasty during the period from 1972 to 1978. The follow-up ranged from two to seven years.

All patients had advanced arthritis (Fig. 1). There were 19 male and 11 female patients (Table I). Age at operation varied from 10 to 40 years (Table II), six patients being under 12 years old. Twenty patients had active infection and significant fixed deformity.

Before operation the patient and his guardians were told the probable results of operation as regards stability, mobility, shortening, and gait. No patient refused surgical treatment. Traction was used for one to three weeks before operation in patients with fibrous ankylosis

Fig. 1

Figure 1—Radiograph of the right hip of a patient, which had been ankylosed for 18 years. This 40-year-old tailor wanted a mobile hip to enable him to sit cross-legged and squat.

Fig. 2

Figure 2—Radiograph three years after excision arthroplasty.

and deformity. Appropriate antibiotics were started before operation in all cases.

Operative procedure. The patient was positioned supine with a thick sandbag under the sacrum. The hip was approached through a Smith-Petersen anterolateral incision. The capsule was cut in an X or T-shaped fashion, and all scarred and obviously diseased tissue excised. Anterior dislocation, where possible, was done to allow excision of the head and neck at the intertrochanteric line. When it was not possible to dislocate the femoral head, the neck was cut at the intertrochanteric line and the head removed piecemeal. Excision of soft tissues and acetabular margin was limited to the removal of debris, of grossly infected tissues, and of any projecting bone (Fig. 2). The raw surface of the proximal end of the femur was cauterised. No attempt was made to interpose soft tissues between the acetabulum and the femur. Antibiotics were instilled locally and the wound closed in layers without drainage. Biopsy material was sent for histopathological and bacteriological examination. Skeletal traction was applied through the upper end of the tibia.
Further management. Appropriate antibiotics for pyogenic or tuberculous infection were continued after operation. Skeletal traction in 40 to 50 degrees of abduction was maintained for four to eight weeks and followed by skin traction to give a total period of traction of about three months. The patient was encouraged to sit during the evening of the day of operation, and active movements of the hip and knee were started during the first week. Patients were encouraged to walk using a weight-relieving caliper after completing three months in traction. During this period active and assisted physiotherapy helped to establish good muscle power and the maximal range of movement. The caliper was usually discarded one year after operation and the patient advised to use a walking stick.

Continued wound infection was unusual and most patients were discharged with a healed wound. After discharge patients were unsupervised except for a six-monthly review.

Assessment of results. A proforma was prepared to record both the objective findings and the subjective views of the patient. This incorporated a grading system modified from Tanaka (1978) which allows for the social customs and way of life in the eastern hemisphere. It takes into consideration activities like sitting on the floor and bending forwards, and squatting. Results were categorised as follows. Good. Pain was relieved completely or to the point where only mild analgesics were occasionally required. Infection was totally controlled. The patient was easily able to squat and sit cross-legged, to walk independently with or without the support of a single stick, to resume normal activities and was fully satisfied with the result. Fair. Pain was significantly reduced, but some remained when bearing weight and required regular doses of analgesics. Infection was controlled and the patient showed functional improvement, squatting and sitting cross-legged being possible with some compensation or difficulty. The patient was to a great extent satisfied with the result. Poor. The patient had persistent infection, and no appreciable functional improvement, with continued inability to squat or to sit cross-legged, and was not satisfied with his results.

RESULTS

Sixteen patients had good results, nine had fair results and five had poor results. This gave 83 per cent that were satisfactory (Table II).

Pain was relieved completely in 21 patients, mild pain on walking was present in eight and pain of significant intensity persisted in one patient with bilateral pyogenic arthritis. Patients with mild pain used analgesics only for symptoms after vigorous activity.

Medial rotation remained restricted in most patients, but this did not prevent squatting or sitting cross-legged (Figs 3 and 4). Twenty-seven patients developed enough flexion, abduction and lateral rotation to allow them to sit cross-legged and squat on the floor. Three patients continued to have gross restriction of movement due to persistence of pyogenic infection or excess new bone formation, or both.

Only two patients had a negative Trendelenberg's sign, but most could walk unaided or with a single stick. Twenty were able to climb stairs using a stick. Twenty-seven patients could manage both the squatting and cross-legged positions. None of the patients were engaged in heavy manual work, but most of them were working as craftsmen, including a tailor, agriculturists, housewives and students. Twenty-one patients could raise a straight leg against gravity and 16 could stand unaided on the operated limb (Figs 5 and 6). Two patients had instability for which a pelvic support osteotomy was later performed.

Some true shortening was present in all patients before operation. Resection of the head and neck added to such shortening but this was minimised by the use of prolonged traction after operation. The average shortening, as measured from the anterior superior iliac spine to the medial malleolus, was 3.2 centimetres before operation and 3.8 centimetres (range three to six centimetres) afterwards. This could be compensated by a shoe raise, the maximum compensation required in the series being four centimetres.

There was no significant correlation between the radiographic appearance and the functional result. Some improvement of mineralisation and bone texture was commonly present in the radiograph at follow-up.

Five patients were not satisfied with the result. One of these had bilateral hip disease, three had persistent infection (two pyogenic, one tuberculous), and three were unable to sit cross-legged or squat. No patient was made worse.

Table II. Results classified by age

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number of patients</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Fair</td>
</tr>
<tr>
<td>10 to 12</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>13 to 19</td>
<td>8</td>
<td>2</td>
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<tr>
<td>20 to 29</td>
<td>10</td>
<td>6</td>
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<tr>
<td>30 to 39</td>
<td>5</td>
<td>3</td>
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<tr>
<td>40 and above</td>
<td>1</td>
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<tr>
<td>Total</td>
<td>30</td>
<td>16</td>
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DISCUSSION

Pyogenic and tuberculous lesions of the hip are quite commonly seen in developing countries. The people of affluent countries may accept a stiff hip in a functional position, but the majority in the eastern hemisphere would prefer a mobile joint because of the social customs of sitting cross-legged, squatting, kneeling and working on the ground. Katayama, Itami and Marumo (1962) employed this procedure in Japan for these reasons. In the West excision arthroplasty has a place as a salvage operation after uncontrolled infection with or

Total hip replacement gives a much better result (Charnley 1972) but this costly operation is not feasible in general orthopaedic departments in developing countries, nor is it generally advocated in infective arthritis. Excision arthroplasty has few contraindications. It can be performed bilaterally and can even be performed when there is involvement of the spine, or the ipsilateral or contra-lateral knee.

The role of Girdlestone's excision arthroplasty is established in the eradication of septic arthritis. In the early era of anti-tuberculous drugs the aim was to eradicate the disease rather than to provide a mobile joint (Mukhopadhaya 1956). Our series shows the safety of the procedure even in tuberculous arthritis. With the use of potent anti-tuberculous drugs the chance of recrudescence of active disease does not seem to be more after excision arthroplasty than in an unsound ankylosed hip.

In our series good or fair results were obtained in 25 of 30 patients (83 per cent). Haw and Gray (1976) obtained satisfactory results in 31 of 40 hips (77 per cent). The shortening in our series was between three and six centimetres, which is less than that reported in other series. We feel that traction after operation for about 12 weeks plays an important part in management. It allows a mobile pseudarthrosis to develop, minimises over-riding, bone abutment and shortening, and encourages fibrous scar formation in the optimal position.

In order to improve stability, angulation osteotomy of the femur has been combined with excision arthroplasty (Gruca 1950; Milch 1963; Narasanagi et al. 1970; Desai and Naik 1978). Transfer of the lesser trochanter to the anterior or lateral aspect of the femur has also been suggested (Nelson 1971). In infective arthritis of the hip, we have found that the stability one year after operation was acceptable in 28 of the 30 patients. Only two patients required pelvic support osteotomy. We do not favour upper femoral osteotomy combined with resection. It is considered that scarring in and around the hip secondary to chronic infection reduces the instability.

Excision arthroplasty removes most of the infected tissues and assists eradication of disease. In the present study, only three patients had episodes of infection after operation. Parr et al. (1971) obtained healing in 26 out of 28 patients. Collis and Johnston (1971) eradicated infection in 11 out of 12 cases. Shepherd (1960) observed similar results and commented "A fair result is more likely than an excellent one, but late poor results are few. Relief of pain is better after excision of the head and neck than after any other operation reviewed."

Haw and Gray (1976) observed less satisfactory results in patients over 50 years of age. The results reported by Clegg (1977) were not as satisfactory as the present series probably because his patients were between 39 and 82 years of age. Rehabilitation becomes more difficult for the older patient because of senile changes and poor musculature. Satisfactory results are likely to be precluded by obesity (Nelson 1971; Sundara Raj, Muthusamy and Kannan 1979) and tall stature (Sundara Raj et al. 1979). Our patients were between 10
and 40 years of age at the time of operation and we had no evidence to support or contradict the above factors.

Excision arthroplasty is technically simple and inexpensive. Management after operation is not complicated and it can be performed in any district hospital in developing countries. Its use for infective lesions of the hip is well founded, as it will relieve pain, correct deformity, control infection and restore movement. The need for a compensatory shoe raise and a stick to counteract mild instability is considered acceptable provided that squatting and sitting cross-legged can be made comfortable.

REFERENCES


