ARTHRROPLASTY FOR OLD TUBERCULOSIS OF THE KNEE

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We have reviewed six patients with old tuberculosis of the knee treated by total replacement an average of 35 years after the primary infection. Three patients had no antituberculous prophylaxis and three had drugs for two to three weeks before and three weeks after the operation. One patient with a missed primary diagnosis had a relapse of the tuberculous arthritis 18 months after his arthroplasty and was successfully treated with antituberculous drugs for one year.

At an average follow-up of 6.3 years all the patients were markedly improved. Old tuberculosis of the knee can be treated successfully with arthroplasty but there is a risk of reactivation of disease and prophylactic drugs are recommended.

Joint replacement for old tuberculous infection of the knee is not yet an established mode of treatment, no series of such arthroplasties having been reported. Some reports have recorded the reactivation of tuberculosis after knee arthroplasty in cases in which the primary diagnosis was missed (Besser 1980; Wray and Roy 1987).

We report six patients with old tuberculosis of the knee treated by total arthroplasty.

PATIENTS AND METHODS

From 1977 to 1984 six patients with old tuberculosis of the knee had total arthroplasties. In five of them, the history of tuberculous infection of the knee was well documented with positive cultures and clinical and radiographic follow-up. In one patient the diagnosis of tuberculosis was made on culture 18 months after the arthroplasty.

There were four men and two women and none of them had had tuberculosis of any other joint. Knee infection had usually been during childhood at an average age of 14.5 years (range one to 58 years), with only one patient over 16 years of age. Mean age at the time of operation was 49.3 years (range 38 to 71 years), thus the arthroplasty was performed on average 35 years (four to 66 years) after the onset of the original infection.

One patient had previously been treated by a supracondylar femoral osteotomy, which had relieved symptoms for over 10 years. All six patients had severe destruction and deformity of the knee and severe quadriceps atrophy with some pain. The average flexion deformity in five patients was 15° (10 to 30°), with an average range of flexion of 80° (20 to 110°). In one patient the knee was ankylosed in 60° of flexion with only a few degrees of painful movement. Four patients had an average of 3 cm leg shortening. On the 100 point evaluation scale of Hungerford and Kenna (1983), in which 80 to 100 points is good or excellent, 70 to 80 is fair, and below 70 is poor, our patients scored an average of 43 points (range 25 to 63).

Three of the patients had a cemented Guepar prosthesis, two had a cemented anamatic prosthesis, and one patient had an uncemented PCA prosthesis. Gentamycin-loaded cement was used in three cases.

Before operation all patients had a normal ESR and none had been on long-term prophylactic antibiotics. Three patients were given prophylactic antituberculous medication for two to three weeks pre-operatively and three weeks postoperatively, the daily doses being 600 mg rifampicin and 300 mg isoniazid supplemented with pyridoxine. The other three had no prophylactic antituberculous treatment, but all six patients had the routine prophylactic antibiotic treatment of 200 mg flucloxacillin daily for five days, which we use for all revision arthroplasties. In the five patients known to have had tuberculosis, samples for routine and tuberculosis culture and for histopathology were obtained at the operation: all these were negative. Patients were encouraged to walk with crutches from the second postoperative day and full weight-bearing without crutches was allowed three months after the operation.

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0301-620X/88/5145 $2.00
Fig. 1  Fig. 2  Fig. 3

Case 6. A 71-year-old woman had tuberculous arthritis of the knee at the age of three years. Figure 1 – Before operation there is secondary osteoarthritis with destruction of the medial joint compartment. Figures 2 and 3 – Eight years after total knee replacement with a Guepar prosthesis, which is well-aligned. The lateral view shows some radiolucency around the proximal tip of the prosthesis.

Table 1. Clinical result in six patients treated by total replacement for old tuberculosis of the knee

<table>
<thead>
<tr>
<th>Case number</th>
<th>Age</th>
<th>Sex</th>
<th>Type of prosthesis</th>
<th>Flexion deformity</th>
<th>Range of flexion</th>
<th>Varus</th>
<th>Valgus</th>
<th>Shortening (cm)</th>
<th>Score</th>
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<tr>
<td>1</td>
<td>44</td>
<td>M</td>
<td>Guepar</td>
<td>5</td>
<td>35</td>
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<td>75</td>
</tr>
<tr>
<td>2</td>
<td>38</td>
<td>M</td>
<td>PCA</td>
<td>0</td>
<td>90</td>
<td>-</td>
<td>2</td>
<td>1.5</td>
<td>100</td>
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<tr>
<td>3</td>
<td>37</td>
<td>F</td>
<td>Anametric</td>
<td>20</td>
<td>90</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>M</td>
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<td>70</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>80</td>
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<tr>
<td>5</td>
<td>59</td>
<td>M</td>
<td>Guepar</td>
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<td>-</td>
<td>8</td>
<td>-</td>
<td>45</td>
</tr>
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<td>71</td>
<td>F</td>
<td>Guepar</td>
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<td>100</td>
<td>3</td>
<td>-</td>
<td>7</td>
<td>85</td>
</tr>
</tbody>
</table>

Follow-up averaged 6.3 years (range 3 to 10 years) and included clinical and radiographic examinations (Figs 1 to 3) and ESR and CRP levels.

RESULTS

Details of the clinical results are given in Table 1 and the radiographs of Case 6 are shown in Figures 1 to 3. In the one patient (Case 4), not diagnosed before arthroplasty, the primary result was satisfactory, but 18 months later an infection of the knee developed, and aspiration revealed tuberculosis. This patient had been treated for an unspecified infection of the knee at three years of age, and there had been no relapse. He had been operated on at 47 years of age; an anametric prosthesis had been used with gentamycin cement. The purulent arthritis of the replaced knee was treated with lavage for seven days and with antituberculous drugs for one year at a daily dosage of 1,600 mg ethambutol, 600 mg rifampicin and 300 mg isoniazid. Two years later the patient has no discomfort and the prosthesis is well incorporated (Figs 4, 5 and 6).

No other patient had any complication, and at follow-up, all six had less fixed flexion deformity, this being on average 5° (Table 1). However, the average range of flexion was reduced to 67°. All patients had a normal or near normal gait, all could walk over one kilometre and four an unlimited distance. None reported pain either at rest or during activity. Leg length discrepancy had not been corrected. The average knee score had improved from 43 points to 79.5. No patient showed elevated ESR or CRP levels and there were minimal radiographic signs of loosening of the prosthesis in only one case.
DISCUSSION

Tuberculous infection is very chronic and total joint replacement as treatment for old tuberculosis has been criticised because of the danger of reactivation of quiescent infection (McCullough 1977; Johnson, Barnes and Owen 1979). However, recent reports have confirmed a relatively good outcome for total hip replacement after tuberculous coxitis (Hardinge, Cleary and Charnley 1979; Jupiter et al. 1981; Kim et al. 1986; Eskola et al. 1988).

As regards knee replacement and tuberculosis, three case reports have been published where tuberculous infection was not suspected before operation and quiescent disease was reactivated (Besser 1980, Wray and Roy 1987). In these cases, as in our single case, antituberculous treatment over one year was successful. Both Hardinge et al. (1979) and Eskola et al. (1988) have shown that hip replacement for old tuberculosis may be successful even without antituberculous medication. Of our present series, half had no antituberculous drugs and the others had a short-term course. In our view, the benefits of prophylactic antituberculous treatment outweigh possible iatrogenic side effects and we now recommend treatment with two drugs for three weeks before operation and for six to nine months after operation. One prerequisite for success is probably a long interval between the primary treatment of the tuberculous arthritis and the arthroplasty; in our series this averaged over 30 years.

We conclude that cured or quiescent tuberculosis of the knee can be treated with arthroplasty, which can provide good functional improvement. Prophylactic antituberculous medication is indicated because of the risk of reactivation of the infection.

This study was financially supported by the Paulo Foundation, Tamperen tuberkuliolosäätö and Finska Läkarättskäpet. No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

REFERENCES


