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# Poor results of double osteotomy for the rheumatoid knee

A series of 27 patients (30 knees) with rheumatoid arthritis was studied 3 to 8 years after double osteotomy of the knee. Long-term results were poor. Double osteotomy should be abandoned in the management of the rheumatoid knee.

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Double osteotomy of the knee for disabling pain in rheumatoid arthritis or arthrosis was introduced by Benjamin (1969); the majority of patients with rheumatoid arthritis were reported to have pain relief for over 5 years (Benjamin & Helal 1980).

We have followed a series of patients for 3-8 years after double osteotomy for rheumatoid arthritis of the knee.

## Patients and methods

Between 1976 and 1981, 29 patients with rheumatoid arthritis underwent double osteotomy of the knee. The indication for the operation was severe pain that had not responded to at least 1 year of conservative treatment in a knee with too much destruction for synovectomy and too little destruction to warrant total knee replacement. Gross instability and flexion of less than 90 degrees were contraindications. All the patients had classical rheumatoid arthritis as defined by the American Rheumatism Association (1959). The disease had begun on an average 18 (4–35) years before surgery, and symptoms in the operated knee had been first noticed on an average 13 (4–35) years before surgery.

At the time of follow-up, 1 patient had died and a second patient could not be traced. Three patients had had double osteotomies of both knees. Thus, 30 double osteotomies in 27 patients were available for study. There were 24 women and 3 men with an average age of 49 (29–68) years.

Double osteotomy was performed as described by Benjamin (1969). Flexion, varus or valgus deformity was corrected by osteoclasis of the soft rheumatoid bone or by removing a wedge. A well-padded plaster of Paris cylinder was applied from groin to ankle with the knee straight.

On the first postoperative day, full weight bearing was allowed. After 6 weeks, the patient was readmitted, the plaster was removed, and the knee was flexed to about 100 degrees under anesthesia. Thereafter, the knee was flexed every hour for 24 hours.

Active exercises were encouraged, if necessary with the assistance of a physiotherapist. All the operations were carried out by or under the direct supervision of an orthopedic surgeon.

The follow-up investigation, after an average of 6 (3–8) years, was based on the Knee Function Assessment Chart as proposed by the British Orthopaedic Research Subcommittee (Aichroth et al. 1978). All the patients were personally interviewed and examined, and relevant details were obtained from the patients' records. Six parameters were considered.

1. *Overall effect.* The overall effect of the double osteotomy – patient satisfied or not – was noted annually for every patient.

2. *Pain.* The effect of the double osteotomy on knee pain – better or not better than before osteotomy – was likewise assessed annually following osteotomy.

For the remaining parameters, comparison was made between the preoperative situation and that at the time of follow-up. If the double osteotomy had been revised to a total knee prosthesis, then, the situation immediately prior to arthroplasty was assessed from the records, radiographs, and the patient's own recollection.

3. *Function.* The functional level was judged on the basis of the walking distance, walking-aid, ability to get out of a chair, ability to climb stairs, and by the sensation of insecurity or instability. All the categories were scored from 0 to 4 or 5 points. The Knee Function Assessment Chart was slightly modified by summing the points scored in the functional categories, so creating a Total Functional Score with a maximum of 21 points.

4. *Range of movement.* Only differences of 10 degrees or more were considered noteworthy.

5. *Radiographic assessment.* An anteroposterior standing radiograph of both knees was obtained at the follow-up. Comparison was made with the preoperative radiographs with regard to the width of the joint space and to the presence of osteophytes, subchondral cysts, and sclerosis.

6. *Knee alignment.* The effect of correcting a varus, valgus, or flexion deformity was subjectively assessed.

## Results

The fraction of patients satisfied with the results deteriorated from half at 1 year to about a third at 3 years (Table 1). This number remained about

*Table 1. Overall effect of double osteotomy for the rheumatoid knee as judged by the patient. The effect of the operation on pain was similar*

| Years after operation | No. of knees | Patients' opinion | |
|---|---|---|---|
| | | Satisfied | Unsatisfied |
| 1 | 30 | 14 | 16 |
| 2 | 30 | 13 | 17 |
| 3 | 30 | 9 | 21 |
| 4 | 28 | 8 | 20 |
| 5 | 25 | 7 | 18 |
| 6 | 18 | 7 | 11 |
| 7 | 8 | 3 | 5 |
| 8 | 1 | – | 1 |

the same until 7 years; the single patient with an 8-year follow-up was dissatisfied. The range of knee movement did not improve after the operation (Table 3).

Double osteotomy made very little difference to the total functional capacity at any time following operation (Table 2). Eight patients had had

*Table 2. Double osteotomy for the rheumatoid knee. Mean functional scores preoperatively and at follow-up or prior to total knee replacement*

| Years after operation | No. of knees | Mean score | |
|---|---|---|---|
| | | Preop. | Postop. |
| 1 | 6 | 12 | 10 |
| 2 | 2 | 10 | 13 |
| 3 | 5 | 12 | 14 |
| 4 | 4 | 12 | 13 |
| 5 | 2 | 16 | 14 |
| 6 | 7 | 13 | 17 |
| 7 | 3 | 14 | 14 |
| 8 | 1 | 14 | 17 |

a total knee prosthesis inserted within 3 years of double osteotomy. Altogether, total condylar knee protheses had been inserted in 14 knees on an average of 2.4 (0.5–5.5) years after double osteotomy, and 1 patient is awaiting arthroplasty.

Radiographically, one knee had improved, 12 knees had no change, and 17 knees had deteriorated more or less severely. Correction of knee alignment had no effect on the results.

*Table 3. Changes in the range of motion following double osteotomy for the rheumatoid knee. Figures are mean (range), degrees*

| | Improvement | | No change | Deterioration | |
|---|---|---|---|---|---|
| | n | | n | n | |
| Flexion | 3 | 15 (10–20) | 22 | 5 | 20 (10–25) |
| Extension | 5 | 15 (10–20) | 19 | 6 | 15 (10–20) |

## Discussion

Huskisson & Phillips (1973) and Angel et al. (1974) were cautiously optimistic about double osteotomy, but their follow-up periods were short. Although our early postoperative results were reasonable, the long-term follow-up does not support such optimism. After 1 year, only half of the patients were satisfied and this fraction gradually decreased to one third 3 years after operation. A reasonable result for 1 year can hardly justify an operation requiring 3 to 6 months of intensive after-treatment. Nine of our patients spontaneously reported that, up to the time of maximum recovery, the whole period had been a miserable episode in their already difficult lives. Particularly painful was the intensive training after manipulation under anesthesia; similar complaints were also mentioned by many of the patients in another series (Angel et al. 1974). Both an Editorial (1975) and Iveson et al. (1977) drew attention to loss of movement following double osteotomy. Overall, impairment of movement was not striking in our follow-up study, but in the individual case, a loss of 20 degrees of flexion or 15 degrees of extension can be troublesome.

In 1976, we thought that double osteotomy was acceptable for use as a temporizing procedure in knees where destruction was too advanced for synovectomy but not so complete as to make a prosthesis inevitable. However, despite the deficiencies of this study, including, as it does, subjective assessments by patients, it would seem that double osteotomy is of little value. Because the long-term results of total knee replacement are so much better than our results of double osteotomy, we would agree with Freeman et al. (1977), who concluded that primary total knee replacement is superior to double osteotomy.

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