PRIMAR Y KNEE ARTHROPLASTY FOR DISTAL FEMORAL FRACTURES IN ELDERLY PATIENTS

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We discuss the role of primary knee arthroplasty in supracondylar and intercondylar fractures of the femur in elderly patients with reference to 13 cases. This method of treatment is shown to be effective and to have good results. It is recommended for all type C and some type A supracondylar fractures in old people.

Supracondylar and intercondylar femoral fractures have a bimodal age distribution (Table I). They may either occur in young patients, usually as a result of road-traffic accidents or sports injuries, or in the elderly, particularly in infirm women who have associated medical problems and often arthritis of the affected knee.

The problems associated with the nonoperative and operative management of elderly patients with supracondylar femoral fractures have been well documented (Wade and Okinaka 1959; Stewart, Sisk and Wallace 1966; Neer, Grantham and Shelton 1967; Schatzker and Lambert 1979; Moore et al 1987). It is therefore surprising that knee arthroplasty has not been considered as a treatment option for this group of patients. Wolfgang (1982) first described a single case of the use of a total knee replacement in a patient with rheumatoid arthritis who had also sustained a supracondylar fracture. We now report 13 elderly female patients who had supracondylar or intercondylar femoral fractures treated by primary knee arthroplasty.

PATIENTS AND METHODS

Between January 1987 and June 1990, 14 knee arthroplasties were performed in 13 female patients with this type of femoral fracture. All fractures occurred in simple falls. The average age of the group was 84 years (67 to 94). All but one patient had debilitating illnesses such as chronic obstructive airways disease, ischaemic heart disease or hemiplegia. Seven had severe osteoarthritis affecting the ipsilateral knee and four had advanced rheumatoid arthritis. Three had previously undergone surgery for proximal femoral fracture. All the patients had required some form of community support to maintain a degree of independence prior to their accident.

The AO system (Müller et al 1990) was used to classify the fractures: group A were extra-articular fractures, group B condylar fractures and group C supracondylar fractures with an intercondylar extension. Ten patients had type C fractures (five 2.3, three 1.1, one 2.1 and one 2.2) usually associated with significant metaphyseal comminution (Fig. 1). The remaining three had type A fractures (two 1.3, one 3.2 and one 3.3).

We performed the operation as soon after admission as the patient's medical condition permitted. A midline approach was used, and the choice of the prosthesis was at the discretion of the surgeon. Ten patients had a Guepar hinged knee replacement (Fig. 2) and two a Kotz modular knee replacement. The remaining patient with bilateral fractures received bilateral Kinematic prostheses. All the prostheses were supplied by Howmedica (UK), London, England.

Postoperative physiotherapy was given in the acute and in the convalescent hospitals but was not continued at home.

RESULTS

The mean in-patient time in the acute trauma ward was 12 days. One patient with bilateral type A supracondylar fractures who had severe coexisting rheumatoid arthritis was kept non-weight-bearing for six weeks postoperatively. The other 12 patients with unilateral fractures...
were encouraged to bear weight as soon after surgery as possible and were mobile at an average of four days postoperatively (2 to 8). They stayed in the acute trauma ward for an average of eight days (5 to 21). Ten were transferred to a rehabilitation ward within one week of the fracture.

Eleven patients returned to their original level of independence in the community within 12 weeks of operation. The deteriorating mental state of one patient necessitated transfer to a nursing home and one patient died after a myocardial infarction, four weeks after her operation.

Postoperatively, all the surviving patients regained full knee extension. The mean knee flexion at six months was $80^\circ$ ($50^\circ$ to $100^\circ$). There was no radiographic or clinical evidence of loosening in any patient after follow-up for a minimum of six months. No patient developed infection and the only complication of arthroplasty was rupture of the patellar tendon, 15 months after the operation, in a patient who was otherwise symptom-free. This was successfully repaired.

**DISCUSSION**

The aim of the treatment of supracondylar and intercondylar femoral fractures is the restoration of knee mobility and the earliest possible return to pre-injury function. Nonoperative management is associated with a high incidence of complications (Schatzker, Horne and Waddell 1974; Healy and Brooker 1983) and internal fixation has therefore been advocated (Chiron et al 1974; Schatzker and Lambert 1979; Giles et al 1982; Mize, Bucholz and Grogan 1982) although the average age of

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**Table 1.** The age groups of patients with supracondylar or intercondylar femoral fractures seen in Edinburgh from January 1988 to June 1990

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<th>Age (years)</th>
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the patients in these earlier series was less than 60 years. Considerable problems have been encountered in using conventional internal fixation techniques in patients over 60 years of age (Schatzker and Lambert 1979; Moore et al 1987) and this has been our experience also.

About 50% of all our patients with supracondylar or intercondylar femoral fractures were over 70 years of age and 36% were 80 or more (Table I). Initially we used primary knee arthroplasty to treat comminuted type C fractures in elderly women with medical disease and poor life expectancies. The successful short-term results encouraged us to expand the indications to include some type A fractures with no obvious intercondylar component, in patients who were medically unfit and had radiographic signs of severe osteoporosis or arthritis.

The results of primary knee arthroplasty in these cases have been excellent. No patient has become infected and most have regained their pre-injury level of independence, with knee function adequate for their restricted needs.

A hinged knee replacement should be used for most supracondylar or intercondylar fractures as the collateral and cruciate ligaments are removed with the distal femur. One patient with bilateral low type A supracondylar fractures had bilateral Kinematic knee replacements but this is unusual. We prefer to use the Guepar II hinged arthroplasty with long femoral and tibial stems, unless the long stem of a hip arthroplasty obstructs the medullary cavity. In these circumstances, we use a Guepar I prosthesis. Extensive metaphyseal or diaphyseal comminution may necessitate the use of a modular prosthesis.

We use an anterior midline approach and resect the distal femur and all bone fragments. After insertion of the arthroplasty any deficiency of bone stock is replaced by methylmethacrylate. This allows early weight-bearing.

Supracondylar and intercondylar fractures in the elderly are usually caused by low-velocity falls; the fracture lines may not displace. Thus, the fracture may be significantly worse than had been predicted from the pre-operative radiographs. We suggest therefore that in elderly patients an anterior approach be used even if internal fixation is contemplated; the surgeon may have to change to arthroplasty and the insertion of a hinge prosthesis is difficult through a lateral approach.

Conclusions. We believe that our results vindicate the use of primary knee arthroplasty with a hinged prosthesis in the treatment of supracondylar and intercondylar femoral fractures in elderly patients who have associated medical problems. We recommend this method in all type C supracondylar fractures and for those type A fractures in which there is coexisting disease, severe osteoporosis or significant arthritic change within the joint.

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REFERENCES


