DISPLACED FRACTURES OF THE DISTAL FEMUR IN ELDERLY PATIENTS

OPERATIVE VERSUS NON-OPERATIVE TREATMENT

M. S. BUTT, S. J. KRIKLER, M. S. ALI

From Russell’s Hall Hospital, Dudley, England

We performed a prospective, randomised controlled trial of the operative versus non-operative treatment of 42 displaced fractures of the distal femur in elderly patients.

Excellent or good results were achieved in 53% of the operated group and in 31% of the non-operated group. There were more complications in the latter, and the time to discharge was considerably longer.

Received 25 April 1995; Accepted 29 June 1995

Distal femoral fractures in elderly patients are often comminuted and unstable. The nature of the fracture precludes weight-bearing in a functional cast brace and the quality of the bone makes open reduction and internal fixation difficult. Prolonged traction in bed risks skin, urinary and respiratory problems. The incidence of these difficult fractures will rise as the number of patients with osteoporosis increases.

We have been unable to find any previous prospective, randomised controlled trials which compare operative with non-operative management of these fractures.

PATIENTS AND METHODS

We made a prospective study of all patients aged over 60 years admitted to Russell’s Hall Hospital from January 1988 to March 1991 with displaced fractures of the distal femur. Each of the four consultants remained on call for a week at a time; two opted for operative treatment and the others treated all patients by traction. Patients deemed to be unfit for surgery were excluded from the trial, regardless of which treatment they would have received. There were 20 patients in group A (operative treatment) and 22 in group B (non-operative treatment). The mean age of group A was 77.6 years and of group B 80.5 years (Fig. 1).

All patients received low-dose warfarin as prophylaxis against deep-vein thrombosis (DVT). Fractures were classified according to the AO system (Müller et al 1990). Patients were discharged when independent, and remained under review until union had been achieved. The outcome was assessed by the criteria of Schatzker, Horne and Waddell (1974) as shown in Table I.

Treatment

Group A. The fractures were fixed with a Dynamic Condylar Screw (DCS; Stratec Medical Limited, Welwyn Garden City, UK) applied to the lateral aspect of the femur, and supplemented with bone graft if the medial cortex was deficient. The knee was mobilised on a continuous passive motion machine after 48 hours. A functional cast brace was applied when the wound had healed, and the patient was mobilised with a walking frame. Intravenous antibiotics were given preoperatively and continued for 24 hours after surgery.

Group B. Skeletal traction was applied, using a Denham pin, and the limb was placed in a Thomas splint with a Pearson knee flexion attachment. The splint was removed and Perkins’ exercises (Usdin 1967) started at three to four weeks. A functional cast brace was applied at six to eight weeks.

RESULTS

Two patients were excluded as being unfit for surgery; both were in group B. One was aged 92 years and was wheelchair-bound. She was returned to her nursing home with her leg in plaster one day after admission. The other was a 79-year-old patient who was severely ill and died after six days in traction. These two patients are not included in the results for group B.

All patients in group A were fit for surgery, but one patient’s family refused to allow an operation, and she was therefore included in group B.

The mean stay in hospital of patients in groups A and B was 39 days (20 to 79) and 62 days (40 to 120) respectively.

The results are shown in Figure 2. In group A, of 17
patients who attended for follow-up, nine had excellent or good results (52.9%). In group B, of 19 patients seen at follow-up, six had excellent or good results (31.6%). The remaining patients failed to attend for assessment, despite repeated letters to them and to their general practitioner.

Table II gives the complications which were almost three times more common in group B.

In group A, one patient died after three weeks from myocardial infarction and one after four weeks from pulmonary embolism. There were two cases of superficial wound infection which settled with antibiotics. One patient had symptomatic loosening of her fixation, which was subsequently removed, and one had malunion (Fig. 3). In another, union did not take place for eight months.

In group B, one patient, aged 95 years, died 26 days after admission. A post-mortem examination was refused and the cause of death was stated as bronchopneumonia. Three patients had DVT diagnosed clinically and confirmed by venography, despite low-dose warfarin. Pressure sores and chest and urinary infections were more common. Two patients required antibiotics and removal of their Denham pin for pin-track infection, and three patients required resiting of the pin for loosening. There were three cases of malunion, all with greater than 20° varus, and two with delay in union, one to eight months and the other to nine months.

**DISCUSSION**

The management of elderly patients with displaced supracondylar femoral fractures continues to pose a challenge.
The mean ages of our patients were 77.6 and 80.5 years (62 to 95) for the operated and non-operated groups, respectively, which is older than those reported in many other series. For this reason, comparison of our results with those reported by other authors should be made with some caution. The only series with a similar age range to our patients is that of Brown and D’Arcy (1971). Closed methods have been advocated by Stewart, Sisk and Wallace (1966), Neer, Grantham and Shelton (1967) and Mooney et al (1970). Stewart et al (1966) reported excellent or good results in 54% of patients who had non-operative treatment, but approximately one-third of their patients had nonunion. Neer et al (1967) had satisfactory results in 84% of the fractures treated non-operatively and in only 52% of those treated by operation. This was a retrospective, non-randomised study, however, which used different outcome measures from those of Schatzker et al (1974). It also used an earlier method of internal fixation and less than 40% of the patients were aged over 60 years.

Various devices have been used for internal fixation including angled blade plates (Schatzker and Lambert 1979), Rush pins (Shelbourne and Brueckmann 1982), Enders nails (Kolmert, Egund and Persson 1983) and purpose-designed nails (Zickel, Hobeika and Robbins 1986; Pryor and Doran 1988; Marks, Isbister and Porter 1994). Recently, the Dynamic Condylar Screw has been shown to give satisfactory results (Schatzker et al 1989; Shewring and Meggitt 1992).

Good results have been reported after internal fixation by several authors (Schatzker et al 1974; Giles et al 1982; Mize, Bucholz and Grogan 1982; Healy and Brooker 1983). The mean ages in these four series were 54.2, 55, 47 and 54 years respectively, and are not comparable with our series. Giles et al (1982) and Mize et al (1982) both reported the results of using AO blade plates, but did not have a conservatively-treated group for comparison. The other two series did compare operative with non-operative treatment, but they were both retrospective, and therefore non-randomised studies. Nevertheless, both reported a better outcome with internal fixation.

We were able to produce a reasonably effective random allocation between our groups of elderly patients. Good or excellent results were achieved in 53% of our patients with surgery (Fig. 4), but in only 31% of those treated non-operatively (Fig. 5). There were considerably fewer complications in the operated group.

Operations on elderly patients must allow early mobilisation so that rehabilitation and restoration of independence can be achieved as soon as possible. The use of the DCS allowed good alignment, adequate joint congruity and early mobilisation of the knee. Most of these patients were able to walk with aids within two to three weeks of operation, and had a mean time to discharge of under six weeks, although in many of them discharge was delayed for social reasons.

Prolonged immobilisation for non-operative treatment places a heavy burden on the nursing staff, and the mean time to discharge for patients in group B was almost nine weeks. There was an increased incidence of DVT, pressure sores and urinary and respiratory infections. Our study
Anteroposterior (a) and lateral (b) radiographs of a patient with a good outcome, despite signs of loosening of the device.

Initial (a) and six-month (b) radiographs of a patient treated non-operatively. There is persistence of the articular step and valgus deformity.
shows a clear benefit from adequately performed internal fixation of distal fractures of the femur in elderly patients compared with non-operative treatment.

We wish to thank Mr T. A. Andrew and Mr R. P. Mifsud for allowing us to include their patients in this study.

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


