Internal fixation of femoral neck fractures in Parkinson's disease

32 patients followed for 2 years

Elisabeth Londos, Lars T. Nilsson and Björn Strömqvist

32 patients, suffering from Parkinson's disease, had internal fixation of femoral neck fractures. In 24 displaced fractures, 6 nonunions and 3 segmental collapses were seen; and in 8 undisplaced fractures, 1 case of segmental collapse was diagnosed. Healing complications were thus seen in one third. Total hip replacement for healing complication was performed in 3 of 32 patients. 9 patients died within 2 years. No difference in the rate of healing or mortality was detected compared with hip fracture patients without Parkinson's disease.

Our study does not support primary arthroplasty for femoral neck fracture in patients with Parkinson's disease.

The complication rate in osteosynthesis of femoral neck fractures calls for identification of patients with an inferior prognosis. Parkinson's disease has been suggested to be associated with the risk of fixation failure due to increased muscle tonus and rigidity (Mattson and Louis 1976, Eventov et al. 1983, Staeheli et al. 1988). In a population-based consecutive series, we have studied the results 2 years after internal fixation of femoral neck fractures comparing patients with and without Parkinson's disease.

Patients and methods

Between 1981 and 1985, 637 consecutive patients from the catchment area of our hospital (population 200,000) were admitted with a femoral neck fracture. Subsets have previously been described (Strömqvist et al. 1984, Strömqvist et al. 1987, Nilsson et al. 1989). Until March 1, 1982, the hip fractures were randomized and operated on with hook-pins or a four-flanged nail (n 70; Strömqvist et al. 1983). Since March 1982, all the fractures have been hook-pinned. Parkinson's disease was not recorded in the initial protocol. Case reports of the hook-pinned patients were scrutinized, as was the computerized register of diagnoses at the hospital. Patients with the diagnosis Parkinson's disease established before fracture and treated with antiparkinsonian medication were identified. No attempt to classify the severity of the disease was made. Five percent of the patients (n 33) suffered from Parkinson's disease. Two-year results were lacking for a 86-year-old woman with a urinary tract neoplasm and a poor general condition. This report concerns the remaining 32 patients.

The mean age of the probands at the time of fracture was 79 (65–91) years. The female/male ratio was 3:1, and one quarter of the fractures were undisplaced. The mean hospital stay was 17 (1–72) days. The majority were discharged to the same habitat as they came from.

Of the remaining 604 patients without Parkinson's disease, 57 patients were excluded because of the lack of a follow-up. The mean patient age was 78 (31–98) years, and the female/male ratio was 2.8:1. Twenty-eight percent of the fractures were undisplaced. The mean length of hospital stay in a subset of the material was 17 days (Nilsson et al. 1989).

Preoperative routines included pin traction through the tibial tuberosity in displaced fractures, no prophylactic antibiotics, and operation on the day after admission if no contraindications were present.

Perioperative routines included general or spinal anesthesia, fluoroscopy (usually biplane), and an extension operating table. In all the cases, fracture fix-

Corresponcence: Dr Lars T Nilsson
Lund University Hospital Department of Orthopedics,
S-221 85 Lund, Sweden

Table 1. Outcome of femoral neck fracture fixation after 2 years in patients with and without Parkinson's disease. Figures in brackets indicate deceased patients with complications. No significant difference in the healing rate was seen in patients with and without Parkinson's disease in any group (chi-square test)

Displacement	Parkinson's disease	N	Dead	Nonunion	Segmental collapse	Uncomplicated healing	Fraction complicated
Undisplaced	+	8	4	0	- (1)	4	0.13
	-	151	48	4	4	95	0.05
Displaced	+	24	5	6	3	10	0.38
	-	396	129	80 (3)	26	158	0.28
Total	+	32	9	6	3 (1)	14	0.31
	-	547	177	84 (3)	30	253	0.21

ation was carried out with two hook-pins (Strömqvist et al. 1983). Postoperative routines included full weight bearing from the first postoperative day. The follow-up protocol consisted of radiographic and clinical examinations at 1 week and 4, 12, and 24 months.

The preoperative radiographs were graded ad modum Garden (1961) as regards fracture displacement; but in this presentation, Garden I and II fractures will be referred to as undisplaced and Garden III and IV fractures as displaced. Redisplacement/nonunion and segmental collapse of the femoral head were recorded as healing complications.

The criterion for uncomplicated healing was solid union without alteration of the femoral head contour at 24 months. In mobile patients with symptomatic healing complications, a secondary total hip arthroplasty was performed; in immobile symptomatic patients, pin extraction only was performed.

Statistics. The statistical analysis was performed with the chi-square test.

Results (Table 1)

Patients with Parkinson's disease

No mortality within 24 hours of the operation was recorded, and there were no wound infections. Of 32 patients, 9 died within 2 years after the fracture, 1 within 4 months. Healing complications were seen in 10 patients (31 percent), or in 39 percent of the survivors. THR had been performed in 3 patients.

Undisplaced fractures. Of 8 patients with undisplaced fractures, 4 died within 2 years after the fracture, 1 of whom had a segmental collapse diagnosed. Because of mild symptoms no reoperation was performed. The 4 survivors had healed fractures without evidence of segmental collapse.

Displaced fractures. Of 24 patients with displaced fractures, 5 died within 2 years from surgery without healing complications. Of the 19 survivors, 6 developed nonunion and 3 segmental collapse. 10 fractures healed without complications. THR has been performed in 2 of the 6 patients with nonunion and in 1 of the 3 with segmental collapse.

Function. Eleven patients were admitted from independent living, 11 from nursing homes, 8 from old peoples' homes, and 2 from other departments; 26 were discharged to the same habitat.

Two years after fracture, 20 patients were alive without a hip prosthesis; of these, 9 denied pain at rest, 8 complained of slight or intermittent pain at rest, and 1 had severe pain requiring analgesics. 13 denied pain while walking, whereas 4 had slight pain and 1 had severe pain. In 2 cases information was lacking. Two were able to walk at least 200 meters, 1 also managed stairs, and 8 walked short distances. Nine were confined to bed, but 4 could take a few steps. Information on walking ability was lacking in one patient.

Patients without Parkinson's disease

No mortality within 24 hours of the operation was recorded. Of 547 patients, 177 died within 2 years (32 percent). Healing complications were seen in 117 patients (21 percent; 32 percent of the survivors).

Undisplaced fractures. Of 151 patients, 48 (32 percent) died within 2 years. None of the deceased had experienced healing complications. Four nonunions and 4 segmental collapses were diagnosed within 2 years. Healing complications were thus seen in 5 percent (8 percent of the survivors).

Displaced fractures. Of 396 patients, 129 (33 percent) died within 2 years, 3 of them with nonunions diagnosed. In 264 survivors, 80 nonunions and

26 segmental collapses occurred. Healing complications were thus seen in 28 percent (40 percent of the survivors).

Comparison of results

No difference in the rate of healing was seen when comparing patients with and without Parkinson's disease.

Discussion

The mortality in the groups with and without Parkinson's disease was very similar and comparable to other large studies on osteosynthesis of femoral neck fractures (Holmberg and Thorngren 1987, Nilsson et al. 1988). Staeheli et al. (1988) reported a 20 percent mortality within 6 months in parkinsonian patients treated with primary prosthesis. Coughlin and Templeton (1980) reported 3/10 deaths with osteosynthesis and 12/17 deaths with prosthesis at 6 months, and concluded by recommending osteosynthesis.

Patients with Parkinson's disease are more vulnerable to physical stress, and deterioration of the disease is often seen after trauma and surgery (Staeheli et al. 1988). Studies comparing internal fixation and prosthetic replacement are few (Johnson and Crothers 1975, Søreide et al. 1979, 1980), but they show an increased need of blood transfusions and a longer hospital stay following arthroplasty. Shorter hospitalization time following internal fixation would seem to indicate easier postoperative mobilization. In this material, the hospital stay did not differ between the 2 groups. Coughlin and Templeton (1980), Eventov et al. (1983) and Staeheli et al. (1988) all reported pulmonary problems, urinary tract infections, prosthetic dislocations, and pressure ulcers as being common in the postoperative course following prosthetic replacement. We have not recorded these complications in the group treated with osteosynthesis, because we have not found them a significant problem. However, it seems reasonable to expect fewer complications if mobilization is easier; the lower mortality rate supports this postulate as does Coughlin's and Templeton's (1980) observation of more decubital ulcers following prosthesis. Secondary hip replacement following failure of osteosynthesis can be performed safely without excess mortality (Hägglund et al. 1984, Nilsson et al. 1989), and all 3 parkinsonian patients in that study were alive 2 years postoperatively.

The functional results of an unselected femoral neck fracture material (Nilsson et al. 1989) are better than in the parkinsonian patients presented here, which probably reflects the neurologic impairment rather than femoral neck fracture complications.

We recommend internal fixation as the primary treatment for parkinsonian patients with a femoral neck fracture.

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