Intertrochanteric and femoral neck fractures in patients with parkinsonism

A. J. HAMMER

Summary

Thirty-eight patients with parkinsonism were reviewed after fracture of the hip. The 12-month mortality rate was the same as in other patients with hip fractures but without parkinsonism. However, the morbidity was higher — with loss of independent existence, loss of ambulation and an increased risk of dislocation of the endoprosthesis.

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Untreated Parkinson's disease shortens life. These patients, when confined to bed, succumb to bed sores, pneumonia and venous embolism. Treatment has reduced the increased mortality associated with Parkinson's disease but there is some controversy as to the degree of improvement.[1,2] Treated patients, who would previously have been chair- or bed-bound, now have more mobility but without concomitant improvement of balance. This may increase the risk of sustaining a fracture of the hip.[3]

Recent reports have shown varying results in treating fractures of the hip in elderly patients suffering from parkinsonism. The implication is that many of these patients do not fare well, manifesting both a high mortality rate and, particularly if their condition is untreated, a high complication rate.[3–7] Experience at this institution with Parkinson's disease patients has not led to such a cheerless outlook. In order to confirm this impression, a review of these patients was undertaken.

Patients and methods

Only those patients already on medical treatment for parkinsonism were selected for the study from the full series of patients with hip fractures managed at this hospital over the 5-year period July 1984 - December 1988.

After admission to hospital with a fracture of the hip all patients underwent an immediate period of resuscitation, during which time dehydration was corrected and any existing medical condition stabilised. All the fractures were treated operatively as semi-emergencies, usually the next day. Surgery was performed under regional anaesthesia.

For non-displaced femoral neck fractures 6 mm diameter screws were used; an uncemented Thompson's hemiprosthesis was used for displaced femoral neck fractures; and a sliding pin and plate for intertrochanteric fractures. All patients received prophylactic antibiotics.

Patients were mobilised as soon after surgery as possible, usually the following day, and discharged when fully mobile. All parkinsonism sufferers were followed up and reviewed between 6 months and 50 months (mean 20,7 months) after fracture. They were then compared with the full series of patients with hip fractures treated at this hospital over the same period.

Department of Orthopaedic Surgery, University of Natal and Addington Hospital, Durban
A. J. HAMMER, F.R.C.S., F.C.S. (S.A.)

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Results

A total of 1 035 fractures of the hip were treated during this period, 992 in unaffected patients and 43 in 38 patients suffering from parkinsonism, an incidence of 4,33%.

The ratio of sub-capital fractures to intertrochanteric fractures in the total series was almost even (531:504). Of the 43 fractures associated with parkinsonism, 28 were sub-capital and 15 intertrochanteric. A similar higher proportion of sub-capital fractures was found by Eventov *et al.*,[3] Rothermel and Garcia[5] and Whittacker *et al.*[7]

Among the 38 patients, there were 5 men and 33 women, a ratio of 1:6. The mean age of patients was 77 years (range 64 - 93 years).

Mortality

Miller[8] proposed that fractures of the hip in the elderly be viewed as a disease with a predictable rate and pattern of mortality. This is particularly so with relation to the mortality rate. The immediate mortality rate after fracture of the hip in an unselected elderly population is raised for a few months[8–10] before returning to that of the normal population.

The 1-year mortality rates (Table I) for intertrochanteric and sub-capital fractures among the parkinsonism patients was almost identical to that for the whole series of unselected patients treated at this institution. Among the unselected patients the rate for the intertrochanteric fractures was 30,95% and for the sub-capital fractures 20,0%.[11,12]

TABLE I. ONE-YEAR MORTALITY RATE

	No. of patients	Died	%
Intertrochanteric fractures	**13**	**4**	**30,76**
Sub-capital fractures	**25**	**5**	**20,00**

Ambulation

Fracture of the hip affects a patient's walking ability. On review, the patients were divided into three groups: (*i*) normal walking (totally unassisted or aided with only a stick; (*ii*) assisted walking (voluntary walking but requiring a walking frame); and (*iii*) immobile (confined to chair or bed with no voluntary initiation of walking.

Before fracture, 71,05% of the parkinsonism patients were able to walk normally. Twelve months after the fracture, the situation was somewhat reversed with only 18,42% able to walk normally and 50% immobile (Table II). Proportionally, this shows a lower mobility than that found in the 333 fractures of the hip in unselected elderly patients previously reviewed at this institution;[11,12] in this series 47,75% of the

TABLE II. AMBULATION FOLLOWING HIP FRACTURE

	Pre-op.		Postop.	
	No. of patients	%	No. of patients	%
Normal	**27**	**71,05**	**7**	**18,42**
Assisted	**6**	**15,79**	**12**	**31,58**
Non-ambulant	**5**	**13,16**	**19**	**50,00**
Total	**38**	**100,00**	**38**	**100,00**

patients were able to walk normally at the end of 12 months, 19,22% required assistance and 33,03% were immobile.

There was a notable difference between those parkinsonism patients with intertrochanteric fractures and those with sub-capital fractures in respect of their ability to walk at the time of review. Of the intertrochanteric fracture patients, 38,46% were walking normally at the time of review, compared with only 8,00% of the patients with sub-capital fractures.

Institutionalisation

Advancing age and immobility as a result of a hip fracture often renders such patients incapable of independent living. The proportion of patients residing in institutions may represent an index of loss of independence.

In this series of parkinsonism patients 30 of the 38 patients (78,94%) were found to be institutionalised when their cases were reviewed. This is a higher proportion than in the unselected patients studied at this hospital among whom only 130 of the 333 patients (39,04%) overall were found to be institutionalised on case review.

A similar increase in the need for nursing-home care for patients with parkinsonism was noted by Staeheli *et al.*[6]

Complications

Four of the 24 Thompson's prostheses inserted in patients suffering from parkinsonism dislocated (16,66%). (This rate is nearly 3 times that of 23 dislocations in 351 hips in unaffected patients (6,55%) also treated with this prosthesis over this period). These figures are similar to the results in the Parkinson's patients reported in Whittacker *et al.*'s[7] series, who showed a 4-fold incidence of dislocation compared with the group as a whole. All patients in the present series had the Thompson's prosthesis inserted without cement which, in itself, usually gives a low dislocation rate.[13,14]

Of the 4 Parkinson's patients with dislocated prostheses, 1 died at 6 months and 1 at 23 months. The 2 other patients continue to live after their dislocation, albeit immobile; 1 now at 15 months and 1 at 32 months after dislocation.

The incidence of other complications was low. Three patients developed bedsores (7,89%), 2 were immobilised by contractures (5,26%) and 1 patient developed sepsis (2,63%). Rothermel and Garcia[5] noted a very low incidence of medical conditions in those patients on treatment, as in our series, compared with those who were not on treatment for their parkinsonism.

Mechanical failures occurred in the prostheses in 3 patients (7,89%). In 1 patient with an undisplaced femoral neck fracture the screws cut through the femoral head. In 1 patient with a sliding nail plate, the nail cut through the femoral head. The third patient fractured the femoral neck despite the presence of a previously inserted sliding nail.

Discussion

Although there is marked variation in the rates of parkinsonism among the different population groups in South Africa,[15] no accurate figures are available to indicate specific incidences. In Britain the incidence of Parkinson's disease in people over the age of 50 years is 1:100.[16]

The decreasing mortality rates for Parkinson's disease and the longer survival of treated patients is reflected in an increasing number of living Parkinson patients in the UK.

Consequently, there will be an increase in the number of elderly patients with parkinson's disease. This being so, an increase in the number of parkinsonism patients sustaining fracture of the hip is to be expected. An increase of this nature has been noted by Rothermel and Garcia.[5]

The incidence of fractures of the hip among patients in the present series (4,33% of the total) is nearly 4 times what would be expected from the quoted incidence of parkinsonism, based on the British figures.

A feature of note is the higher proportion of sub-capital fractures compared with intertrochanteric fractures in these patients. Poor muscle function may explain this anomalous result. Muscle contraction plays a role in the supportive functions of the hip joint and neutralises tensile strains about the hip.[17] Frankel[17] suggests that impaired neuromuscular mechanisms may contribute to fracture of the hip and that overloading of the bone may occur as a result of a lack of inhibitory impulses to the muscles during a fall. Alternatively, a fracture may occur after failure of the muscles to dissipate the kinetic energy of a fall. The higher incidence of femoral neck fractures in parkinsonism patients may be related to the impairment of the power, or of the reflexes, of their hip muscles. Poor musculature may also explain why only 8% of patients with sub-capital fractures were able to walk normally after fracture compared with 38% with intertrochanteric fractures.

Coughlin and Templeton[4] reported a high incidence of serious complications and mortality among their patients with fracture of the hip and parkinsonism. This applied particularly to those patients with dislocated prostheses. In their series, 37% of intracapsular fractures treated with a hemiprosthesis dislocated. All these patients died within 6 months.

On the other hand, Rothermel and Garcia[5] state that levodopa has made fracture management easier in patients with Parkinson's disease. Patients on levodopa are more active, have more muscle power and diminished tremor. They feel it is possible to treat hip fractures in patients with Parkinson's disease who respond to levodopa therapy with minimum regard for their neurological disease, and expect such patients to have virtually the same course during surgery and rehabilitation as an average elderly patient who enjoys generally good health.

In the present series there was a definite increase in morbidity among patients with parkinsonism. A high proportion required institutional care and their ability to walk normally after fracture was markedly diminished compared with others unaffected by parkinsonism. There was also an increased risk of dislocation of the hemiprosthesis.

Nevertheless, in patients already on medical treatment for parkinsonism, an increase in the 12-month mortality rate could not be demonstrated. There was also a low incidence of medical complications. It is concluded that it is essential that patients are treated for their parkinsonism, if present, as well as their hip fracture.

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