

Outcome following proximal femoral fracture in the elderly female

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SUMMARY

Outcome after proximal femoral fracture was assessed in 89 elderly females. Mortality both in hospital and subsequent to discharge was identified, with a mortality rate of 13·5% at 30 days and 35% after one year. The median length of stay was 28 days, with 40% of subjects transferred for geriatric-orthopaedic care. Delay prior to surgery and its relationship to increased mortality was highlighted. The importance of the fracture population and its selection and influence on outcome is discussed, indicating the need for caution in comparative audit.

INTRODUCTION

Fracture of the proximal femur is a common condition in the elderly, affecting 12% of women by the age of 85 years and carrying a high morbidity and mortality.^{1, 2} In addition the incidence of this fracture is increasing more rapidly than would be expected as a result solely of the steady increase in the elderly population.^{1, 3–6} Together, these and other factors result in proximal fracture presently occupying 25% of orthopaedic beds,² with the attendant hospital costs further increased by subsequent community care.

Alongside the need to identify the causes of proximal femoral fracture, in particular the roles of reduced bone mass, bone quality and prevention of falls, it is essential that the present care of the elderly presenting to hospital is appropriate and effective. This is especially so as the demographic ageing of the population alone will result in a further 25% increase in the numbers of elderly females presenting with hip fracture in the coming decade in greater Belfast. The recognition of the need for collaboration between orthopaedic surgeons and physicians in geriatric medicine has led to the development of either liaison services or orthopaedic geriatric units of varying design.^{7–13} Other innovations include a rapid transfer system¹⁴ or use of a “hospital at home” nursing service.¹⁵

In the Royal Victoria Hospital, Belfast, a geriatric orthopaedic ward round takes place every week in the acute orthopaedic unit. The resultant selective transfer of

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patients for further rehabilitation to the setting of geriatric hospital beds has been the established pattern of care. This study presents and examines some of the outcomes of this scheme, including survival and length of hospital stay.

PATIENTS AND METHODS

The fracture unit of the Royal Victoria Hospital receives patients on a rotational basis shared with the other Belfast hospitals. All consecutive females admitted in 1987 from greater Belfast over the age of 65 with proximal femoral fracture were enrolled in this study. Assessments were performed on a weekly ward round by a geriatrician accompanied by the orthopaedic house surgeon and ward sister, and if recovery following surgery was considered to be inadequate or slow, transfer was arranged to a separate geriatric medical facility under the care of a consultant physician in geriatric medicine. Patients are required to be medically fit for transport by ambulance prior to such transfer. Patients deemed to be progressing satisfactorily to enable discharge to the residence from which they were admitted remained in the acute orthopaedic unit and advice was provided as necessary regarding changes in medical management or paramedical involvement. Information was also gathered at assessment regarding pre-admission drug therapy, social circumstances, type of dwelling and level of independence. In addition the type of fracture and date of surgery were noted. The data was updated at each weekly review, place and date of discharge were recorded, and survival documented from general practitioner or hospital records.

Patients transferred to the geriatric medical unit were cared for in a interdisciplinary team approach led by a consultant physician in geriatric medicine, with active participation of the physiotherapy, occupational therapy and social work disciplines. The nursing staff endeavoured to promote and encourage the achievement of independence in the activities of daily living. Home visit assessments were carried out if indicated prior to discharge, and follow-up arranged at a geriatric day hospital or outpatient clinic.

RESULTS

Age

A total of 89 females were admitted to the acute orthopaedic unit with a mean age of 83.3 (range 71–94) years. Subsequently 11 patients died in this unit (mean age of 86.8 years), 40 were discharged directly home (mean age of 80.9 years) and 38 transferred to the geriatric unit (mean age of 84.2 years).

Length of stay

The mean length of stay for the 89 patients was 42 days (median 28 days). The mean length of stay of the 40 patients discharged directly home was 26.6 days (range 2–120), and 18 days (range 1–76) for the 11 patients who died in the acute orthopaedic unit. The remaining 38 patients were transferred to the geriatric medical unit after a mean length of stay of 20.9 days (range 6–94) in the acute orthopaedic unit and remained in the geriatric medical unit for a further mean stay of 44.4 days (range 2–334). (Table 1).

TABLE I
Outcome in the 89 patients with fracture of the proximal femur

	<i>Discharged direct from orthopaedic ward</i>	<i>Discharged from geriatric medical unit</i>	<i>Discharged to long term care</i>	<i>Died in orthopaedic ward</i>	<i>Died in geriatric medical unit</i>
Number	40	30	3	11	5
Mean age in years	80.9	83.7	88.0	86.8	85.2
Mean length of stay in days (orthopaedic)	26.6	18.3	42.6	18.0	22.6
Mean length of stay in days (geriatric)	—	29.7	195.3*	—	41.8
Total mean length of stay in days	26.6	48.1	238.0	18.0	64.4
Total median length of stay in days	19.0	37.5	242.0	11.0	34.0

*Remained in care until death.

Time of surgery

Surgical operation was undertaken in 79 patients, 27 within one day of admission, 25 between one and two days, and 27 waited more than two days (Table II). Those in whom surgery was delayed up to two days were significantly older with a substantially higher hospital mortality of 28%. Surgery was not performed in three patients with stable painless impacted sub-capital fractures. Seven patients were considered medically unfit for surgery, of whom six subsequently died in hospital after a mean length of stay of 6.8 days (range 1–15) and one patient returned to the psychogeriatric unit from which she had been admitted.

TABLE II
Surgical delay following admission of elderly women with proximal femoral fracture (n = 79)

<i>Days</i>	<i>Days after admission</i>		
	<i>0–1</i>	<i>1–2</i>	<i>2+ (range 2–14)</i>
Number of patients (% of total)	27 (34%)	25 (32%)	27 (34%)
Mean age in years	80.3	84.1	81.0
Number of hospital deaths (%)	3 (11%)	7 (28%)	3 (11%)
Mean length of stay in days	25	62	49
Median length of stay in days	27	34	32

Outcome

A total of 40 patients were discharged directly from the acute orthopaedic unit, 29 (72.5%) home and 10 returned to long term psychogeriatric and nursing home care from which they had been admitted, with one new placement in

nursing home care. A total of 30 patients were discharged from the geriatric unit, 25 (83%) to return to their homes, four to residential homes from which they had been admitted, with one new placement in residential care. Three patients in whom further clinical improvement was considered unlikely and who had not responded to rehabilitative measures were deemed to require long term hospital care.

Sixteen patients died in hospital, 11 in the fracture ward and a further five after transfer to the geriatric medical unit. The overall hospital mortality was 17.9%. The one year survival was 65% and the two year survival 59% (Figure).

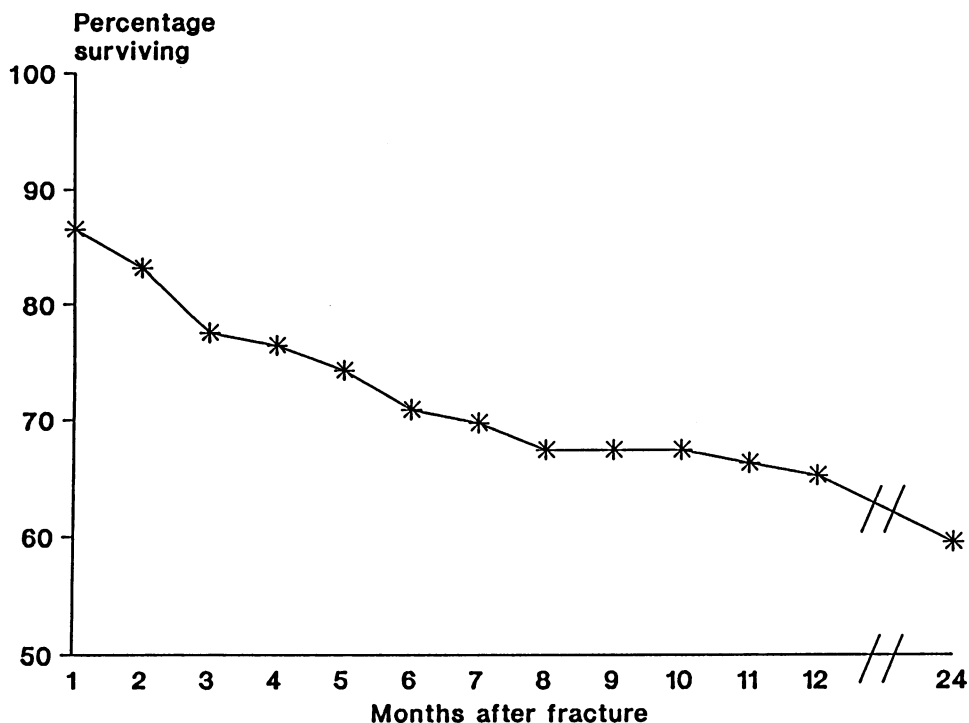


Figure. Survival (%) after hip fracture in 89 elderly females.

DISCUSSION

It is important to emphasise that this study describes the outcome of an unselected population of elderly women over the age of 65 years admitted with proximal femoral fracture. This is in contrast to other studies which may exclude patients admitted from other hospitals¹² or who are unfit for transfer.¹¹ If the fracture populations studied differ in their selection then this will also alter the outcome, and comparisons must therefore be made with caution. The hospital mortality in this study of 18% refers to a mean length of stay of approximately six weeks, and is similar to the 20.1% reported from Nottingham in 1982,⁸ the 21% in Belfast in 1984,¹⁶ and 17% after 30 days in Dorset.¹⁷

The mean length of stay in Belfast continues to fall from approximately 80 days in 1969,¹⁸ 53·9 (median 32) days in 1981 and 1982¹⁹ to the present figure of 42 (median 28) days in this study. This present median length of stay approaches the median stay of 24 days in the intervention group rather than the 41 days in the control group reported in a clinical trial of geriatric rehabilitation in Stirling,¹¹ and the mean length of stay of 42 days is similar to the 44 days reported from an orthopaedic geriatric inpatient service in Glasgow.¹² It would appear from these comparisons that the present system of selective transfer to geriatric care in Belfast operates favourably in terms of length of stay.

One area highlighted in this study is the delay prior to surgery. It has previously been reported that delay may result in increased mortality.²⁰ While in this study 66% of subjects were operated on within 48 hours in comparison to 48% 2–3 days after admission in London,²¹ this is still poor in comparison to the 78% within 24 hours and 90% within 48 hours from Glasgow.¹² Those patients delayed in our study for up to two days carried a much increased mortality of 28% in comparison to the mortality of 11% of those treated surgically within 24 hours, and also a greatly prolonged length of stay. Although part of this difference is due to pre-existing conditions requiring treatment prior to anaesthesia, supported by the higher mean age of those on whom surgery was delayed, reducing this surgical delay in those fit for earlier anaesthesia will result in a reduction of morbidity and mortality. In addition, this reduction of surgical delay will allow a proportional shortening of hospital stay²² and a swifter introduction of rehabilitation.

Analysis of outcome revealed that a total of 54 (61%) of all admissions were successfully discharged home, with 72% of live discharges from the fracture ward and 83% from the geriatric medical unit returning home. These differences result from a higher proportion of direct discharges from the orthopaedic unit returning to nursing and psychogeriatric care from which patients were admitted, but do highlight the large proportion of patients who may be successfully rehabilitated and discharged to their own home. This is further supported by the finding that only three subjects required long term hospital care, one nursing home care and one residential care as a consequence of the fracture. Approximately 6% of elderly hip fracture patients will require alternative placement on discharge and it is important that this decision is reached only after a full programme of rehabilitation to prevent inappropriate institutional care.

The 35% mortality one year after hip fracture in the elderly is significantly higher than the expected annual mortality of 80-year-olds of approximately 4–5%. The mortality after hip fracture appears to fall to the expected rate only after approximately six months, in comparison to previous studies reporting an interval of two months,²³ three months²⁴ as well as six months.²⁵

The one year survival after fracture of 65·2% is comparable to the 67% survival reported from the elderly in Stirling²⁶ and 58% from Dorset.¹⁷ This is in contrast to a previous report from Belfast in 1986 with a low six month mortality of 15% suggesting that not all elderly subjects were enrolled following fracture.²⁷ The remarkably low one year mortality of 17·4% in Baltimore²⁵ may in part reflect the inclusion of only the elderly residing in the community at the time of fracture, excluding the frail elderly in institutional, residential and nursing home care.

Similarly, divergent lengths of stay in two hospitals in Newcastle upon Tyne were attributed in part to differences in the populations admitted with a fracture.²⁸ It is clear from these studies that before comparisons of outcome and length of stay are made, the nature of the fracture population and its selection must be clearly identified and delineated. This example of femoral neck fracture indicates the need for care in the audit of hospital treatment of other more complex conditions.

This study highlights the high mortality of 29% in the elderly in the first six months after hip fracture. The present pattern of selective transfer of 40% of the elderly after hip fracture for inter-disciplinary geriatric rehabilitation enables a high proportion of survivors to return to their own homes. Further improvements in outcome with reduction of length of stay will occur if improved organisation allows surgery to be undertaken within 24 hours of admission in subjects fit for anaesthesia.² With the projected increase in the number of elderly who will present with femoral fracture, increased efficiency in the use of resources is essential to ensure improvements in the quality of care and outcome.

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