

## CONSUMPTION VERSUS NEED OF INSTITUTIONAL CARE AFTER FEMORAL NECK FRACTURE

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**ABSTRACT.** For 137 patients who sustained a femoral neck fracture domiciliary circumstances, ADL functional level and walking ability were recorded during a period of six months in 1983. At the time of injury 71 % were living at home or in a so-called service apartment with medical and domestic facilities, and 28 % in chronic care institutions (1 % were transferred from other acute care units). Of the surviving patients 43 % could return directly home or to a service apartment on discharge, 21 % were transferred to an orthopedic rehabilitation facility, convalescent home, or other acute care unit, and 36 % to chronic care institutions. At the 1-year as well as at the 2-year follow-up 39 % of the surviving patients were living in chronic care institutions. Analysis of the various parameters for patients having recourse to chronic care facilities at follow-up, showed that almost half of this group might be cared for at home. However, this will only be possible on condition that an extensive and effective home medical care system is developed as a complement to domestic assistance provided by public agencies. It is unrealistic to expect the incidence of patients needing chronic care facilities following femoral neck fracture to subside below a minimum of 20 %.

*Key words:* femoral neck fracture, ADL function, rehabilitation, consumption of institutional care.

The authorities responsible for providing public health services in Sweden have based their planning for the next decade on the concept of a continuing trend away from institutional systems for both acute and chronic medical care. It will become increasingly common for both geriatric and other patients to be cared for at home and to this end plans for a comprehensive system of home care resources provided by public agencies are at present being evolved.

Patients with hip fracture (of which femoral neck fractures constitute about 50%) occupy more hospital beds than any other patient category on orthopedic and surgical wards. At the same time we are confronted with a strong increase of fractures of the proximal end of the femur which are expected to reach double the present incidence the next 20 years (8, 10).

The aim of this prospective study has been to record domiciliary circumstances and functional level in patients with fresh femoral neck fractures at one and two years postoperatively in order to be able to assess the need of postoperative care and rehabilitation and to provide a basis for planning suitable care facilities for this patient category.

### MATERIAL AND METHODS

A consecutive series consisting of 137 patients with fresh femoral neck fractures was included in a prospective study carried out at the Department of Orthopedic Surgery at Södersjukhuset during the period January 1-June 30, 1983. The parameters recorded were type of living accommodation, walking ability, ADL independency, and general medical condition both prior to injury and at follow-up one and two years postoperatively. The series consisted of 96 women and 41 men (Table I), with an average age of 77 years (range 39-99 years). Treatment of the fractures consisted of internal fixation with Nyström nails in 70 cases and with Scand screws in 63 cases. The patients who had been ambulatory were mobilized the day after fracture fixation under supervision of a physiotherapist. Full weightbearing was allowed and an early return home was encouraged by positive attitude manifested by the entire therapeutic team. In 4 cases primary arthroplasty with a Moore prosthesis was performed owing to failure to achieve acceptable fracture reduction. Subsequent complications (redisplacement, nonunion, late segmental collapse) occasioned arthroplasty with a Moore or Charnley prosthesis if warranted by the patient's symptoms and not contraindicated by other medical considerations. Hospital mortality in the orthopedic unit was 4% and the subsequent mortality rate was 9% after 3 months, 15% after 6 months, 20% after 1 year, and 34% after 2 years.

### RESULTS

*Type of living accommodation* at the time of injury, after discharge, and 1 and 2 years postoperatively for the surviving patients is illustrated by the pie charts in Fig. 1A-D. Patients admitted from a chronic or other somatic care unit were usually

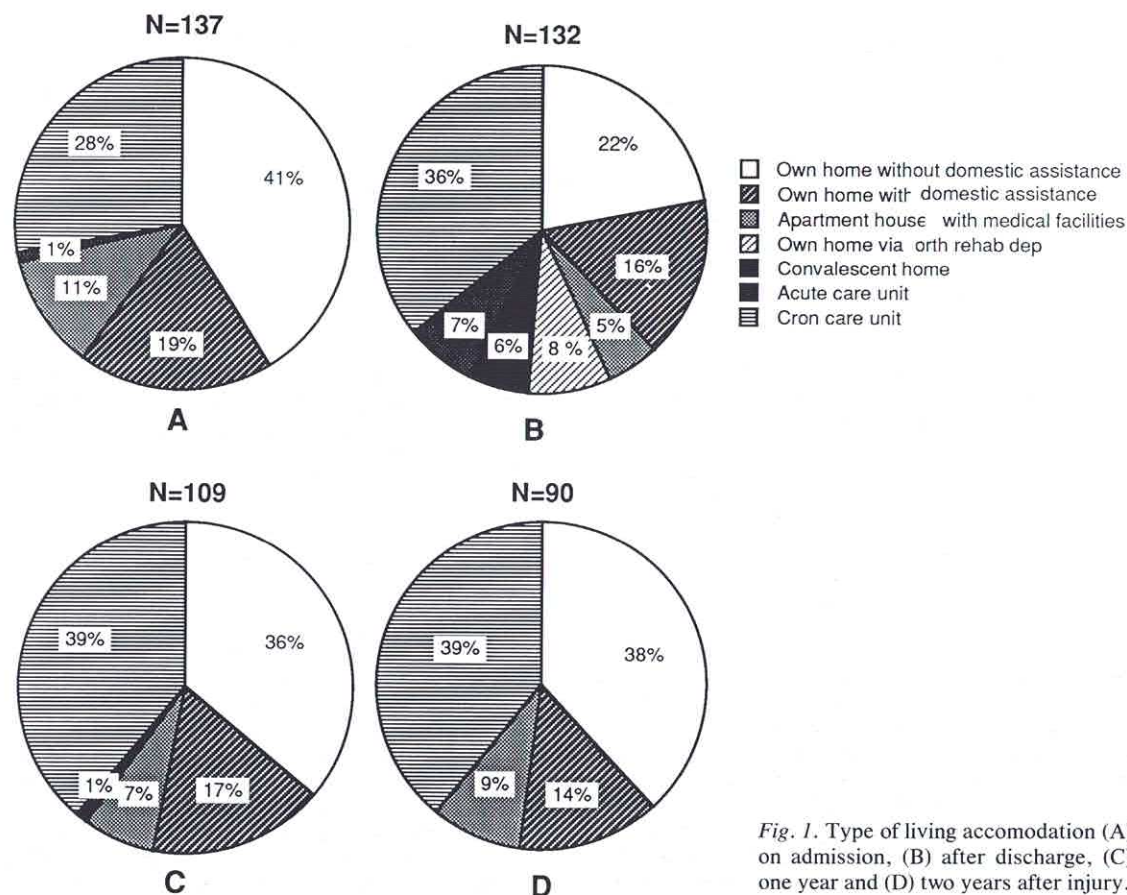


Fig. 1. Type of living accommodation (A) on admission, (B) after discharge, (C) one year and (D) two years after injury.

discharged to the referring institution the day after operation. The median hospitalization time was 2 weeks for patients who were discharged to their home without requiring domestic assistance provided by public agencies and for those transferred to a convalescent home. The median hospitalization time was 3 weeks for those discharged to an orthopedic rehabilitation unit, an apartment with medical and domestic facilities and those who could return home with domestic assistance provided by

public agencies. The 10 patients who prior to admission lived at home or in a so-called service apartment and had to be discharged to a chronic care unit, had a median hospitalization time of 3.5 weeks (range 2–7 weeks) on the orthopedic ward.

*Walking ability* prior to injury and at the one-year and two-years follow-up is shown in Fig. 2A–C. Functional level as reflected by *ADL independency* is illustrated by the diagrams in Fig. 3.

The rate of *concomitant morbidity* handicapping

Table I. Age and sex distribution (n=137)

	Age				
	<60	60–69	70–79	80–89	>90
Men	2 (2%)	11 (8%)	16 (12%)	9 (6%)	3 (2%)
Women	2 (2%)	14 (10%)	33 (24%)	41 (30%)	6 (4%)
Total	4	25	49	50	9



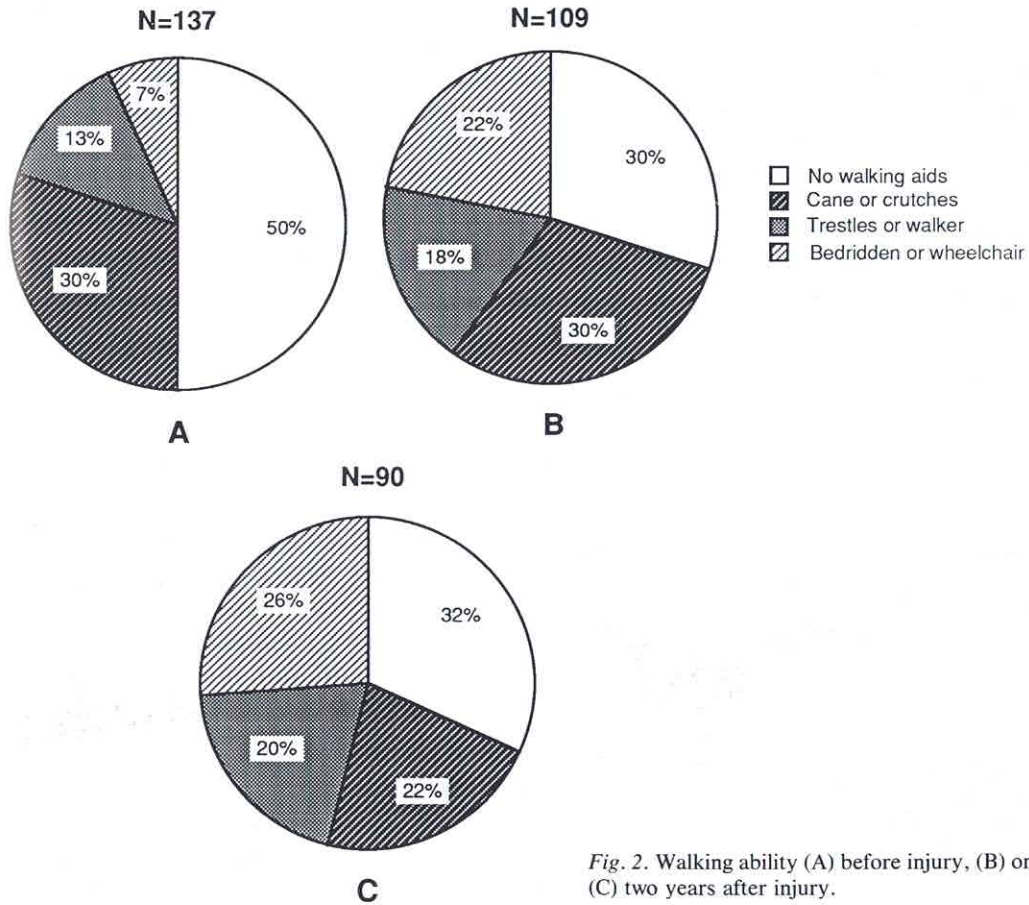


Fig. 2. Walking ability (A) before injury, (B) one year and (C) two years after injury.

the patients to a varying degree was high (Table II). The general medical condition and the degree of medical disability remained fairly constant during the period of observation for the patients included in the follow-up. At the time of injury 37% of the patients were "healthy" except for their hip fracture. One year postoperatively the proportion of "healthy" patients was 39% and at 2 years 36%. Concomitant disease not interfering with rehabilitation was noted in 19% both at the time of injury and

at the 1-year follow-up, and had increased to 21% at the 2-year follow-up. Concomitant disease interfering with rehabilitation was noted at these different times in 45%, 42% and 43% of the patients.

Table II. Associated morbidity at time of injury (n=137)

Neurological disease	26%
Senile dementia	22%
Cardiopulmonary or renal disease	14%
Previous orthopedic affections	14%
Diabetes mellitus	5%
Alcoholism	5%

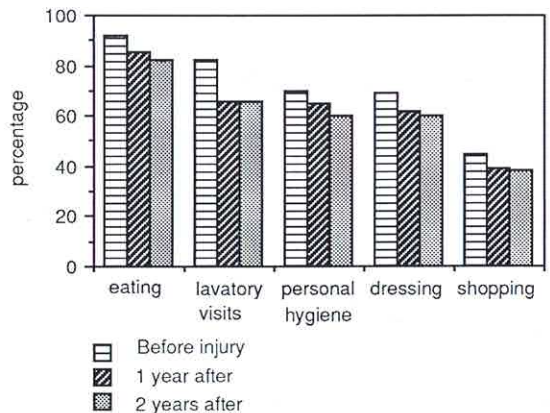


Fig. 3. Functional level as reflected by ADL independency before injury (n=137), one year (n=109) and two years (n=90) after injury.

## DISCUSSION

Reports on the consumption of acute and chronic care resources for hip fracture patients in the Scandinavian countries cover metropolitan populations in 1974 (8) and 1975–1977 (5), medium-sized urban populations in 1970–1978 (11) and 1982 (12), and small-town populations in 1972–1973 (2), 1977–1980 (9) and 1978–1980 (6). Patients in the present study were derived both from a metropolitan inner city area and from nearby suburban areas. The population served by the Department of Orthopedic Surgery at Södersjukhuset comprises 240 000 inhabitants with a strong bias towards the higher age groups, with 7 000 women over 80 years. Our series consisted of patients with femoral neck fractures, which means that it is not quite comparable with the patient series cited above. Patients sustaining femoral neck fractures are generally in somewhat better medical condition and have less trouble starting walking exercises after fracture fixation than those who have sustained a pertrochanteric femoral fracture. This is also reflected by a somewhat shorter median acute care hospitalization time, i.e. two weeks for femoral neck fractures as compared to 4 weeks for pertrochanteric femoral fractures (8).

The studies cited above report that between 60 and 79% of the patients lived at home at the time of injury, while between 10 and 28% were referred from a chronic care unit. During less than a decade the type of living accommodation at the time of admission for patients with femoral neck fractures in the Stockholm area has undergone a considerable shift. Holmberg & Thorngren (5) showed that 79% of their patients lived at home and only 12% were admitted from a chronic care unit. The decrease in the proportion of patients capable of living at home prior to injury found in the present study can partially be explained by the extension of chronic care facilities which occurred during the 1970s and 1980s.

In the majority of reports cited above the incidence of patients able to return to their own home was about 40% as compared to 54% in the present study. This difference can partially be explained by the fact that the present series only included femoral neck fractures. The proportion of patients discharged to chronic care units was of the same order of magnitude in these previous studies except for Ceder's (2), which reported 22% and Snaedal and coworker's which reported 15%. These two latter

studies were initiated as part of a comprehensive postoperative ambulatory care project for hip fracture patients, where a contributory factor to the relatively low dependency on postoperative chronic care facilities may be that elderly people in a small town environment can count on considerably more help from relatives and neighbors than those in a metropolitan area. The proportion of patients admitted from other types of living accommodation which had to be transferred to a chronic care unit was lower in our series (21%) as compared to Snaedal and coworkers (27%) (9), despite a much lower total transferral rate to a chronic care unit in their series. This reflects the motivation of the rehabilitation team towards a return to their original environment for patients admitted from their own home or service apartments.

A high incidence of concomitant morbidity and an increased mortality rate during the first year following hip fracture in comparison with an age-matched control group reported in previous studies (2, 4, 7, 8, 10) was confirmed by the present study. Cerebral impairment was found to be the major problem with respect to postoperative rehabilitation. Nevertheless, the incidence of patients with concomitant disease liable to interfere with rehabilitation at the time of injury remained fairly constant for the surviving patients at the 1-year and 2-year follow-up in the present series, i.e. slightly more than 40%.

Ceder et al. (3) identified certain factors which proved significant for enabling patients to return to a noninstitutional form of living after hip fracture. Apart from age, sex, and type of fracture the most important factors in this context were walking ability before injury and 2 weeks postoperatively and the fact that the patient did not live alone and before fracture had been able to visit some relative or friend at least once a month. In the present study it was considered that a combined assessment of a number of factors, i.e. walking ability and the ability to manage lavatory visits, personal hygiene, and eating without help would be valuable in predicting the patient's possibilities of coping with living at home or in a so-called service apartment and the amount of help needed after a femoral neck fracture.

The results of the assessment of functional level and walking ability show that with active rehabilitation about 40% of all patients with femoral neck fracture can be discharged directly home or to a



service apartment after 10–14 days hospitalization on an orthopedic ward, and some 20% after another 1–2 months' stay in an orthopedic rehabilitation unit or via another acute care unit. The majority of these patients, however, will for at least another 6 months to a varying degree need domestic help and other services provided by public agencies. Some 20% of the patients could move about with trestles or a walker, but the majority could not manage lavatory visits or personal hygiene without help and were moreover afflicted by concomitant morbidity, specifically neurological disease and senile dementia. This category of patients will therefore need care resources in excess of the domestic services offered by community agencies, but if these are complemented by visiting medical care they should nevertheless be able to continue living at home. The remaining 20% were nonambulant and on the whole incapable of coping with all the activities of daily living without help; often because of a coexisting anxiety state or other mental disturbance. The patients in this group consequently make heavy demands on care resources and are therefore in need of chronic care facilities. Unless their demands to a great extent be met with the help of relatives, these patients would require extremely resource-consuming home medical care, often involving round-the-clock service.

The demands on postoperative public resources will be at least in the same order of magnitude for patients with pertrochanteric femoral and other osteoporotic fractures.

The results of the present study indicate that there is a discrepancy between consumption and the need of institutional care of patients with femoral neck fractures. The number of those transferred to chronic care units is larger than necessary. Provided that a considerably more extensive and effective home medical care system becomes a reality, it should be possible for a further 20% of these patients to be cared for at home. We feel, however, that it is unrealistic to ever expect the number of patients from an area with a similar social structure in need of chronic care institutions to fall below 20%, without placing an unproportionately large burden on relatives. These beds need not be sited in large chronic care hospitals but should rather be placed in smaller units—small local hospitals or interspersed in old peoples homes or even in apartment houses providing domestic and social facilities.

A further condition for keeping the need of institutional care resources at a minimum level as outlined above is that orthopedic treatment must be as effective as possible. The majority of the patients should be operated on with closed reduction and nail or screw fixation. Reduction should be attempted in all cases, but if adequate reduction cannot be achieved primary arthroplasty is recommended. Those patients who are not transferred to chronic care institutions should be offered ambulatory follow-up of the results of treatment at the orthopedic department. If complications ensue secondary arthroplasty should be undertaken as soon as possible, in order to preserve the patient's walking ability and thereby obviate the need of institutional care. In dubious cases, i.e. patients with persistent weightbearing pain 3–5 months postoperatively without roentgenological evidence of a loss of reduction, scintimetry can be used as an aid in diagnosing complications (1).

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