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OUTCOME OF PATIENTS WITH A NAILED HIP FRACTURE REQUIRING REHABILITATION IN A HOSPITAL FOR CHRONIC CARE

Jon Snaedal,[1] Margareta Thorngren,[1] Leif Ceder[2] and Karl-Göran Thorngren[2]

From the University Departments of [1]Community Health Science and [2]Orthopaedics in Lund, Sweden

ABSTRACT. The rehabilitation outcome of seventy-eight consecutive patients with nailed hip fractures admitted to a hospital for chronic care from an orthopaedic department during 1977 through 1980 was followed for two years. They comprised only 13 % of all hip fracture patients, the others being discharged to their own homes or old people's homes. Thirty-four of the admitted patients came originally from their own homes, 23 from old people's homes and the others from hospitals for chronic care. Each had been selected for long-term care by the orthopaedic surgeon and his staff as the likelihood of rehabilitation in his/her original habitat was considered poor. Because of an active rehabilitation at the hospital for chronic care, one-third of the surviving patients were discharged to their own homes or old people's homes within one year after the fracture. Most of these patients came originally from their own homes. Once discharged, the patients did not need to return to the hospital for chronic care.

Key words: Hip fractures, fractures, rehabilitation

Sweden, as all Western countries, has a growing proportion of elderly in the total population. The incidence of hip fractures is among the highest in the world; one out of five women aged 80 or above has sustained or will sustain a hip fracture (1). The incidence is still rising (5, 8, 9). Half a century of successful development of hip fracture technology has led to improved osteosynthesis, rapid mobilization, shorter hospitalization, and efficient rehabilitation. Still, the impact of hip fractures is a burden on orthopaedic and rehabilitation departments and all chronic care facilities.

In Lund in southern Sweden a rapid rehabilitation programme with mobilization in the orthopaedic department and direct rehabilitation at home with a minimum of secondary institutionalized rehabilitation has been applied to patients with hip fractures (2–4). Even so, one-fourth of the patients had to be referred to institutions, whether old people's homes or hospitals for chronic care. The patients discharged to the hospitals for chronic care are the very old, those in poor medical condition, fracture complications, or those living in unfavourable social conditions, i.e. factors detrimental to further rehabilitation. The purpose of the investigation was to study the outcome of this group of patients, of which little is known.

PATIENTS AND METHODS

All patients living in the community of Lund, aged 50 years or above, and sustaining a cervical or trochanteric hip fracture followed by referral from the orthopaedic department to the hospital for chronic care in Lund during the years 1977–80 were included in the study. Thus, out of a total of 595 patients with hip fractures, 78 patients were studied (Table I).

Table I shows the total number of patients with a hip fracture each year at the orthopaedic department and the total number of patients referred to the hospital for chronic care from their own home and from all habitats. Of the 78 patients, 34 came from their own homes and 23 from old people's homes (Fig. 1). Of the remaining patients, 19 came from hospitals for chronic care and 2 from other hospital units.

The age of the patient, concomitant disease, type of fracture, type of operation, complications and activities of daily living (ADL) for those patients discharged from the hospital for chronic care, compared with those not being discharged, are shown in Table II. The intention was to evaluate factors characteristic for those patients possible to discharge. Statistical analysis was performed with χ^2-test with Yates' correction and for age with Student's t-test. The patients were operated on mainly with Rydell nailing (cervical fractures) or Ender nailing (trochanteric fractures). The other operations (Table II) consisted of 6 nail-plates according to McLaughlin, one Thornton nail, two Moore hemiarthroplasties and one Lubinus total hip arthroplasty. The hip complications consisted of 13 dislocated nails due to non-union of the femoral neck, two segmental collapses of the femoral head and one infection. The rehabilitation progress of the investigated patients and their treatment level were recorded at 4 months, at 1 year and at 2 years after the fracture.

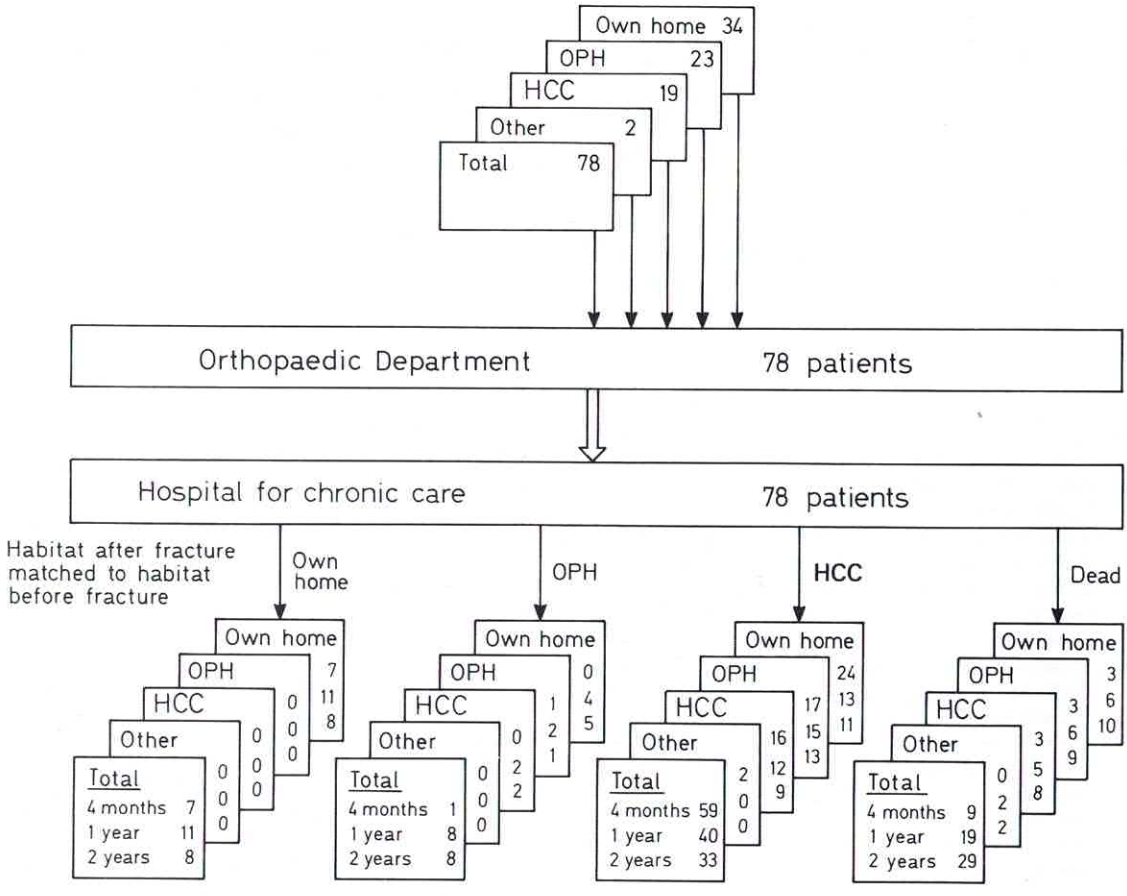

Fig. 1. Flow chart of hip fracture patients, treated at the orthopaedic department and admitted to a hospital for chronic care, showing their habitat before fracture and after rehabilitation at the hospital. OPH = Old people's home. Habitat at 4 months at one year and at 2 years after fracture indicated in lower part, both for total number of patients and for subsets indicating their prefracture habitat.

The orthopaedic department is the only unit for treatment of hip fractures in the city of Lund, and the hospital for chronic care is the only institution of its kind within the area. An intesified programme of rehabilitation for hip fracture patients has been in progress in Lund since 1976 (2, 3); the programme is summarized as follows:

(1) *Information* provided on admission (and repeated later) to hip fracture patient and relatives: a booklet on hip fracture.

(2) *Early internal fixation* with immediate mobilization and weight-bearing.

(3) *Evaluation of individual rehabilitation goal* and

Table I. *Total number of patients (age ≥50 years) with a hip fracture during 1977–1980 admitted from the Lund central area and those discharged to a hospital for chronic care (HCC)*

	From all habitats			From own home		
Year	Total	To HCC	To HCC in Lund	Total	To HCC	To HCC in Lund
1977	139	15 (11)	14 (10)	106	9 (9)	8 (8)
1978	133	23 (17)	22 (17)	86	10 (12)	9 (11)
1979	167	35 (21)	30 (18)	112	15 (13)	12 (11)
1980	156	14 (9)	12 (8)	99	7 (7)	5 (5)
1977–1980	595	87 (15)	78 (13)	403	41 (10)	34 (8)

Number in parentheses is percentage of corresponding total.

Table II. *Variables for hip fracture patients, able to leave the hospital for chronic care (HCC) after rehabilitation and for those who could not be discharged*

Variables	Leaving HCC	Signi-ficance	Still in HCC, or dead
Age ($M \pm$ SD)	78±10	**	85±7
Concomitant disease			
Somatic	13	NS	18
Mental	2	***	16
Mental and somatic	1	***	22
Type of fracture			
Cervical	9	***	31
Trochanteric	13	*	25
Type of operation			
Rydell nailing	7	***	27
Ender nailing	12	*	21
Other	3	NS	8
Type of complication			
Of the fracture	5	*	12
Cardiovascular	0	*	4
ADL at discharge			
Needing help	3	***	55
Independent with walking aids	17	***	1
Independent without walking aids	2	NS	0

***$p<0.001$, **$0.001<p<0.01$, *$0.01<p<0.05$ and NS $p>0.05$.

planning for discharge: (*a*) Circumstances before fracture: social situation (living alone or with someone); everyday activities indoors and out; and general medical condition (especially mental state).
(*b*) Postoperative stability of hip fracture (weight-bearing immediately).
(*c*) Evaluation of mobilization period: continuous tests of function (walking and ADL) and assessment of complications both local (i.e. the fracture) and general medical. Continued intensified functional training.

(4) *Consultation* with local community care centre upon admission, during stay and before discharge home. Social arrangements and technical aids provided in cooperation with the local community.

(5) *On the day of discharge*, after a journey home in a taxi the patient is received in her home by local health centre staff who check on the patient's ability to manage minor household tasks and assess the need for home help and physiotherapy. Later, technical aids are changed (e.g. a walking-stick instead of a walking frame); and the patient takes an accompanied walk to the nearest shop.

(6) *Four months after hip fracture* the patient visits the orthopaedic clinic for a hip X-ray and final evaluation of rehabilitation and a decision about the need for a secondary procedure.

RESULTS

The number of hip fractures increased during the years investigated, but on average the fraction of patients discharged to the hospital for chronic care was unaffected (Table I). The habitat for the 78 patients treated at the hospital for chronic care during the follow-up period of 2 years after the fracture is shown in Fig. 1. Thus, 34 and 23 out of 78 patients originated from their own homes or old people's home, respectively. Fig. 1 illustrates not only the initial habitat but also the habitat to which the patients were discharged and living at various times after the fracture. Furthermore, Fig. 1 also shows, distributed according to type of fixed habitat, where the patients had lived before the fracture. Thus, within 4 months, 8 patients were discharged: 7 to their own homes and one patient to an old people's home; 59 patients were still in the hospital for chronic care and 9 patients had died. One year after the fracture 11 patients were living at home and 8 in old people's homes, 40 patients were still in the hospital for chronic care and 19 had died. After 2 years, 8 patients were in their own homes, 8 in old people's homes, 33 still in the hospital for chronic care, and 29 patients had died. The patients still in their own home 2 years after the fracture had all orginally come from their own home. Of those patients living in an old people's home, 5 had originally come from their own home, one from an old people's home, and 2 from the hospital for chronic care. Of those 23 patients com-

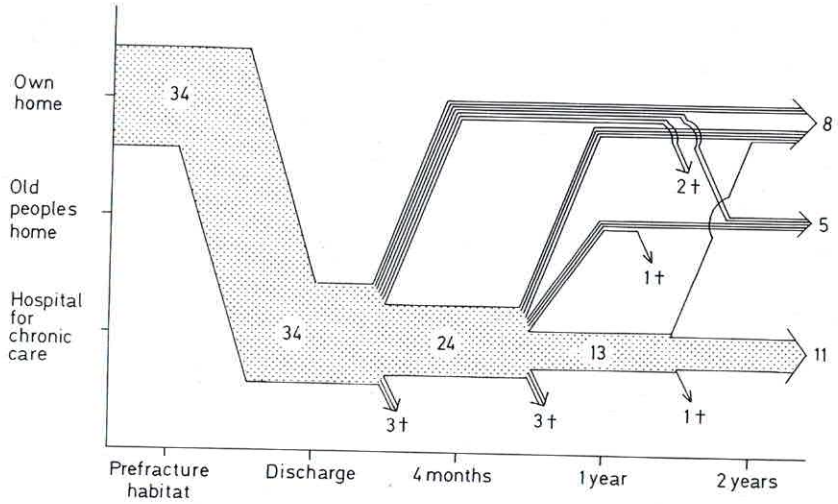

Fig. 2. Flow chart of hip fracture patients, coming from their own homes and discharged from the orthopaedic department to a hospital for chronic care showing their habitat at different periods after the fracture.

ing originally from old people's homes, all but one remained in the hospital for chronic care.

The outcome for the patients coming originally from their own home is shown in greater detail in Fig. 2, where it is also possible to follow the individual patient throughout the 2-year period. One-third of the surviving patients returned to their own homes, most within one year, and 12% were discharged to an old people's home. Once discharged, the patients did not return to the hospital for chronic care. Two of the patients initially discharged to their own home within 4 months were admitted to an old people's home one year later.

The characteristics of all patients discharged to their own home or to an old people's home are shown in Table II. When compared with the remaining patients, the discharged patients were somewhat younger. They had less often cervical fractures (Rydell nailed). Mental diseases were significantly more prevalent among the patients who coult not be discharged. Most discharged patients were independent, after rehabilitation, when using a walking aid, whereas 3 patients who needed help with the activities of daily life could still be discharged.

DISCUSSION

In many countries and in most parts of Sweden too, patients with hip fractures are routinely discharged to institutions for secondary rehabilitation – a rehabilitation which in most cases could be achieved in the patient's own home (2, 3, 6). We know from earlier work (4) that about 15% of these patients admitted to an orthopaedic department from their own home are predestined to long-term care, mainly due to concomitant disease. Some patients from old people's homes are also predestined to long-term care for the same reason.

We have shown that with an active rehabilitation programme, most of the hip fracture patients (more than 80%) who are admitted to the orthopaedic department from their own home return there, that they are in fairly good physical and mental condition and that the majority return to their former daily activities already within 4 months after the hip fracture (4). However, little is known about the outcome of those remaining patients who are referred to a hospital for chronic care (HCC) after nailing of their fractured hip.

Our hospital for chronic care has during 1977–80 received selected patients with estimated poor prognosis for return to their previous dwelling. All other patients were admitted to their own home or to old people's homes. When comparing the central area of Lund with the other more rural areas which the hospital serves, the total discharge rates to HCC during these years were from all habitats 15% and 24%, respectively. For patients coming from their own home the discharge rates to HCC were 10% and 15%, respectively. The selection of patients with unfavourable prognosis for rehabilitation was thus less favourable in Lund's central area. They represent patients with very high age, concomitant disease, fracture complications, or with unfavourable social conditions. In spite of this

negative selection it was still possible to rehabilitate and discharge as many as a further one-third of these patients to their own homes. Another 12% of the patients originally coming from their own homes were discharged to an old people's home. However, the outcome of those patients originating from old people's home was less favourable. Of 23 patients, only one returned to his prefracture habitat during the 2-year follow-up period. Many of the patients in old people's homes today have gradually lost their functional independence. These patients in fact require nursing care at HCC. The hip fracture will therefore only be the final step for a permanent admittance to a HCC. It is also interesting that 2 out of 19 patients originally living in the HCC care could be discharged to live more independently, e.g. in an old people's home. These patients were one woman aged 73 years with a hemi-paresis and one woman aged 80 years with Parkinson's disease and a depression which benefited from electroconvulsive therapy.

The follow-up period after the hip fracture for all patients was 2 years. At various times the proportion of patients discharged and still living in their own home or in an old people's home, in relation to those still in the HCC was as follows: at 4 months, 8 versus 59 patients (12%); at one year, 19 versus 40 patients (32%); and at 2 years, 16 versus 33 patients (33%) are living in these habitats, respectively. This means that an increasing proportion of the hip fracture patients are living in their own homes or in old people's homes within the first year. Thereafter, the further rehabilitation potential decreased continuously with time. Two years after the hip fracture, two-fifths of the 78 patients admitted were still in the HCC, one-fifth were discharged and two-fifths of the patients had died (Fig. 1). Thus, the continuous rehabilitation programme gave results mainly during the first year, which is in accordance with the experience of Katz et al. (7).

The outcome and the dwelling pattern for the patients originally coming from their own homes is shown in detail in Fig. 2. It is noteworthy that most of the patients continued at the same level of habitat they had achieved once they were discharged from the hospital for chronic care. Only 2 patients discharged to their own homes were later admitted to an old people's home, but none to the HCC.

The probability of discharging patients to their own home or to old people's home from a HCC depends on several factors (Table II), apart from the main one, the prefracture habitat 'own home'. Patients who can be discharged after a long period of nursing are those with fracture complications, most often instable trochanteric fractures, which do not allow immediate full weight-bearing. After adequate healing, which usually takes 4–6 months, these patients can be discharged. This applied to one-third of the patients successfully rehabilitated in the present investigation. Other patients are those with a concomitant disease which is treated or undergoes spontaneous remission, i.e. cerebrovascular lesion or transient confusion.

Patients with prefracture chronic concomitant mental disorders (mostly severe senile dementia) were rarely discharged. Another group of patients successfully discharged were those where the social factors changed positively during the period after the hip fracture. The variables most significant for patients able to leave the hospital for chronic care were thus, the prefracture habitat 'own home', predominance of trochanteric fractures, freedom from chronic mental diseases, and a slightly lower mean age, all of which at discharge mostly coincided with a minimal need for walking aids or help with ADL.

In conclusion, with an active rehabilitation attitude at a hospital for chronic care, one-third of the admitted (13% of all hip fractures) patients could be discharged either to their own home or to an old people's home within one year after the injury, despite a preliminarily unfavourable prognosis for recovery.

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Offprint requests to: M. Thorngren, M. D., Department of Community Health Science, University Hospital in Lund, S-221 85 Lund, Sweden.

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Adress for offprints:
Margareta Thorngren
Norra Sjukhuset
S-221 85 Lund
Sweden