

ORIGINAL ARTICLE

Does Rehabilitation Matter in Patients With Femoral Neck Fracture and Cognitive Impairment? A Prospective Study of 246 Patients

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ABSTRACT. Al-Ani AN, Flodin L, Söderqvist A, Ackermann P, Samnegård E, Dalén N, Sääf M, Cederholm T, Hedström M. Does rehabilitation matter in patients with femoral neck fracture and cognitive impairment? A prospective study of 246 patients. *Arch Phys Med Rehabil* 2010;91:51-7.

Objective: To identify factors associated with preserved walking ability and Katz activities of daily living (ADLs) index at 4-month and 12-month follow-up in cognitively impaired patients with femoral neck fracture.

Design: Population-based cohort study.

Setting: A multicenter study of the Stockholm Hip Fracture Group including 4 university hospitals.

Participants: Consecutive patients (N=246) with femoral neck fracture, older than 65 years (mean, 84y; 72% women) with cognitive impairment (known dementia or low [0–2 points] score) in Short Portable Mental Status Questionnaire [0–10 points]) and able to walk before the fracture.

Interventions: Not applicable.

Main Outcome Measure: Walking ability and ADLs index at 4-month and 12-month follow-up.

Results: Significant predictors of preserved walking ability at 12-month follow-up were discharge to rehabilitation unit (odds ratio [OR]=2.83; confidence interval [CI], 1.1–7.26; $P=.03$) and walking ability before the fracture (OR=8.98; CI, 3.52–22.93; $P<.001$), while type of surgery was not ($P=.197$). Analyses were adjusted for age, sex, American Society of Anesthesiologists score, fracture type, and surgical method. Corresponding predictors of preserved Katz ADLs index at 12-month follow-up, after adjustment for age and sex, were discharge to rehabilitation unit (OR=5.33; CI, 1.44–19.65;

$P=.012$) and ADLs index before fracture (OR=2.51; CI, 1.8–3.5; $P<.001$), while type of surgery was not ($P=.376$).

Conclusions: Discharge to rehabilitation unit, a factor we can influence, was associated with preserved walking ability and ADLs index in cognitively impaired patients with hip fracture.

Key Words: Activities of daily living; Dementia; Hip fractures; Rehabilitation; Walking.

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PATIENTS WITH COGNITIVE impairment have a higher rate of falls and fractures.¹⁻³ As the number of elderly increases worldwide, the number of patients with impaired cognitive function will also increase.⁴ Previous studies have shown that impaired cognitive function is an important predictor of poor prognosis after hip fracture regarding walking ability, ADLs, and return to independent living.⁵⁻⁷ However, a few recent studies have reported that cognitive impairment per se does not significantly affect the functional gain in elderly patients with hip fracture if they were referred to rehabilitation.⁸⁻¹⁰ Limitations of these studies include the small number of patients and the short follow-up periods. Others have studied whether the type of surgical procedure affects functional outcome in patients with hip fractures and cognitive impairment.^{11,12} Nonetheless, prospective studies investigating other potential predictors of long-term functional outcome in patients with hip fracture and cognitive impairment are lacking.

Our objective was to include a large number of consecutive patients with femoral neck fracture and cognitive impairment in an observational study to find factors associated with preserved walking ability and ADLs index at 4-month and 12-month follow-up.

METHODS

Setting and Study Population

All patients admitted for hip fracture to the 4 university hospitals in Stockholm (Danderyd Hospital, Söder Hospital, Karolinska University Hospital, Huddinge, and Karolinska

List of Abbreviations

ADLs	activities of daily living
ASA	American Society of Anesthesiologists
CI	confidence interval
HA	hemiarthroplasty
MMSE	Mini-Mental State Examination
OR	odds ratio
SPMSQ	Short Portable Mental Status Questionnaire

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University Hospital, Solna) during 1 year (2003) were consecutively included in the Stockholm Hip Fracture Group study ($n=2213$). Patients older than 65 years with nondisplaced Garden I to II or displaced Garden III to IV femoral neck fractures,¹³ cognitive impairment defined as previously diagnosed dementia or low score—that is, 0 to 2 points according to the SPMSQ (see procedures below)¹⁴—and who were able to walk were considered for the study. A total of 246 patients met these criteria. The study was performed in accordance with the Helsinki declaration,¹⁵ and protocols were approved by the local ethics committee.

Procedures

All assessments, except the ASA classification¹⁶ and fracture classification, were carried out by specially trained research nurses. The following variables were recorded at inclusion: age, sex, prior diagnosis of dementia, ASA score, and number of medical diagnoses. Living situation, walking ability, and ADLs status during the last week before fracture were assessed by proxy—that is, from close relatives or caregivers.¹⁷ We also recorded whether patients were discharged to rehabilitation units. Living situation was recorded as either independent (own home or service apartment) or institutionalized (nursing home or residential care home). Walking ability was recorded as able to walk outdoors, only indoors, or unable to walk. ASA score¹⁶ was assessed by the attending anesthesiologist. ASA score classifies the physical status of patients into 5 categories ranging from 1 (healthy) to 5 (moribund). ADLs status was assessed according to the Katz index¹⁸—that is, independence or dependence in bathing, dressing, going to the toilet, transferring, continence, and feeding. ADLs index A indicates independence in all 6 functions, while index B indicates independence in all but 1 of the 6 functions. Indexes C through G indicate dependence in bathing and at least 1 other function.

A total of 963 patients sustained femoral neck fractures. The SPMSQ was used to assess 803 patients; 85 patients had already been diagnosed with dementia and were included in the current study without an SPMSQ assessment. The remaining 75 patients (8%) were not assessed by SPMSQ and were not included in this study (missing). The SPMSQ is a 10-item questionnaire that assesses the patient's cognitive function. It has good validity and reliability, and it is easy and quick to administer.¹⁹ The SPMSQ classified the patients as having severe cognitive impairment with 0 to 2 correct answers ($n=178$), moderate cognitive impairment for 3 to 5 correct answers ($n=111$), mild cognitive impairment for 6 to 7 correct answers ($n=119$), and intact cognitive function for 8 to 10 correct answers ($n=395$).

Hip fractures were classified by orthopedists with extensive surgical experience in hip fractures. During the primary hospital stay, treatment modality, number of deaths prior to discharge, and postoperative complications were recorded. Three treatment modalities were used at the 4 hospitals: internal fixation using 2 cannulated screws,^a uncemented HA using Austin Moore implant, and cemented HA. HA was carried out using either an anterolateral approach or posterior approach, depending on the preference of the surgeon.

Patient Care

The 4 hospitals had in general the same care program. All patients received some physiotherapy directly after operation until discharge—that is, patients were encouraged to stand up on the first postoperative day. In the next few days, patients were assisted by physiotherapists to take a few steps using a walking table and with personal support when necessary. The

decision to transfer patients to rehabilitation units was made by the attending physician in cooperation with the ward staff—for example, nurses and physiotherapists. A general routine of all 4 participating hospitals was that patients that were admitted from institutions—that is, nursing homes and residential care homes—would be discharged back to the institution as soon as they were medically stable.

Residential care provided by the communities is governed by another legislation act, the Social Services Act, in contrast with health care, including rehabilitation, that is provided by the County Councils (Health and Medical Services Act). In general, physiotherapists are few in community-provided care, and they are seldom involved in the caretaking of the residents. On the other hand, there are various rehabilitation units for old adults. Most of them are run by or in agreement with the Stockholm County Council. The County Councils are responsible for health care, including rehabilitation for all inhabitants. Physiotherapists and occupational therapists are involved in daily rehabilitation activities of patients referred to such units. The main goal for rehabilitation is to restore patients' walking ability in order to allow patients to return to their previous living condition.

Follow-Up

Patients were followed up at 4 and 12 months via telephone interviews with the proxy. All patients reporting problems were scheduled for a recheck, including radiographic studies. Date of death was registered when appropriate. Walking ability, ADLs index, healing complications, reoperation, general major complications (pneumonia, heart failure, myocardial infarction, pulmonary embolism, renal failure, cerebrovascular accident, gastrointestinal bleeding), and place of residence were recorded. Walking ability (outdoors, indoors, or unable to walk) at 4-month and 12-month follow-ups was compared with walking ability at admission and categorized as "preserved walking ability" if no change had occurred. ADLs index at follow-up was compared with ADLs index at admission and similarly categorized. Length of stay, including stay at the rehabilitation unit, was registered.

Statistical Methods

We used SPSS 16.0 for Windows^b as statistical software. Normally distributed independent variables were tested for differences using the Student *t* test. We used the Kruskal-Wallis test to compare nonparametric variables. Contingency tables were tested for differences with the chi-square test. The Pearson chi-square exact test was used if some cells in contingency tables had fewer than 5 expected counts. We used logistic regression analysis²⁰ to adjust dichotomous variables. A *P* value less than .05 was considered statistically significant.

Multivariate Analysis

Stepwise multiple logistic regression analyses were performed to investigate which factors could predict walking ability, ADLs index, and discharge to rehabilitation. Independent variables were age, sex, ASA score, number of comorbidities, walking ability before fracture, ADLs index before fracture, type of fracture, surgical method, discharge to rehabilitation units, living situation, major complications, and reoperation. Significant variables were kept in the models, while factors previously shown to be important independent predictors of the tested outcome were used for adjustment if they did not jeopardize the prediction ability of the model.

RESULTS

Table 1 shows baseline data for all patients. Median age was 85 years (range, 68–103). A total of 19 (8%) died before hospital discharge. Of the remaining 227 patients, 81 (36%) were discharged to rehabilitation units, and 146 (64%) were discharged directly to their previous place of residence. One hundred patients had been admitted from their own homes, and 70 (70%) of them were discharged to rehabilitation units after surgery. Corresponding figures for patients admitted from institutions were 10 of 125 (8%). The living situation of 2

Table 1: Baseline Data in Relation to Discharge to Rehabilitation Units

	All N=246	Discharged to Rehabilitation Units* n=227		P
		Yes	No	
Mean age ± SD (y)	84±6	85±6	84±6	.205
	No. (%)	No. (%)	No. (%)	
All patients	246 (100)	81 (36)	146 (64)	
Age				
66–80y	61 (24.8)	16 (19.8)	43 (29.5)	.110
>80y	185 (75.2)	65 (80.2)	103 (70.5)	
Women	178 (72.4)	56 (69.1)	111 (76.0)	.259
Men	68 (27.6)	25 (30.9)	35 (24.0)	
ASA score				
1–2	81 (32.9)	28 (34.6)	50 (34.3)	.690
3	137 (55.7)	43 (53.1)	83 (56.8)	
4–5	28 (11.4)	10 (12.3)	13 (8.9)	
Number of comorbidities				
0–1	140 (56.9)	45 (55.6)	89 (61.0)	.496
2	73 (29.7)	23 (28.4)	41 (28.1)	
≥3	26 (10.6)	11 (13.5)	11 (7.5)	
Missing	7 (2.8)	2 (2.5)	5 (3.4)	
Walking ability				
Outdoors	74 (30.1)	30 (37.0)	43 (29.5)	.440
Indoors	157 (63.8)	47 (58.0)	97 (66.4)	
Missing	15 (6.1)	4 (5.0)	6 (4.1)	
Walking aids				
None/1 cane	94 (38.2)	37 (45.7)	55 (37.7)	.379
Two canes/walker	144 (58.5)	43 (53.1)	86 (58.9)	
Missing	8 (3.3)	1 (1.2)	5 (3.4)	
Fracture type				
Displaced	183 (74.4)	71 (87.7)	97 (66.4)	<.001
Nondisplaced	63 (25.6)	10 (12.3)	49 (33.6)	
Type of procedure (displaced)				
IF	70 (38.3)	26 (36.6)	37 (38.2)	.471
Uncemented HA	70 (38.3)	24 (33.8)	39 (40.2)	
Cemented HA	43 (23.4)	21 (29.6)	21 (21.6)	
Own home				
Yes	107 (43.5)	70 (86.4)	30 (20.5)	<.001
No	136 (55.3)	10 (12.4)	115 (78.8)	
Missing	3 (1.2)	1 (1.2)	1 (0.7)	
ADLs index				
A–B	68 (27.7)	41 (50.6)	24 (16.4)	<.001
C–G	142 (57.7)	27 (33.3)	107 (73.3)	
Missing	36 (14.6)	13 (16.1)	15 (10.3)	

NOTE. All data stated as number (%), except for mean age. ADL A or B indicates independence in all 6 functions or independence in all but 1. Abbreviation: IF, internal fixation.

*Nineteen patients died before discharge.

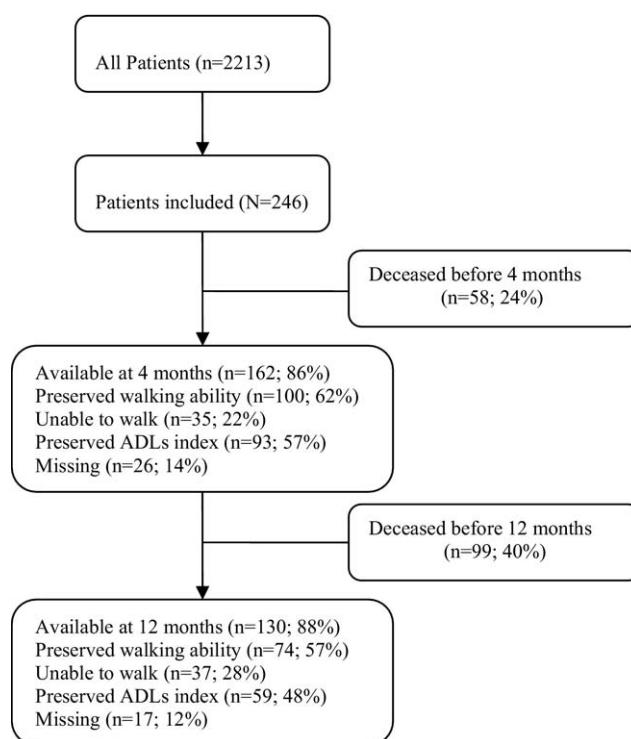


Fig 1. Flow chart describing patients at the different levels of the analysis.

patients was not recorded. The numbers of patients who died prior to 4-month and 12-month follow-ups were 58 (24%) and 99 (40%), respectively (fig 1). Sixty-three patients (25%) had nondisplaced fractures and were operated with internal fixation. One hundred eighty-three patients (75%) had a displaced fracture. Of these, 70 (38%) had internal fixation surgery, 70 (38%) underwent uncemented HA using Austin Moore implants, and 43 (24%) underwent cemented HA.

Walking Ability

Before fracture, all patients were able to walk (see table 1). Of the survivors at the 4-month follow-up, information on walking ability was available for 162 (86%). One hundred patients (62%) had preserved walking ability, while 35 patients (22%) were unable to walk. Of the 147 patients who were alive at the 12-month follow-up, information on walking ability was available for 130 patients (88%). Seventy-four patients (57%) had preserved walking ability, and 37 patients (28%) were unable to walk. As shown in table 2, discharge to rehabilitation units and walking ability before fracture were independent predictors of preserved walking ability at 4 and 12 months, whereas surgical method was not ($P=.95$ and $P=.197$, respectively). The logistic regression analyses were adjusted for age, sex, ASA score, fracture type, and surgical method. The model correctly predicted preserved walking ability in 76% of patients at both time points.

At admission, 94 patients (38%) used 1 cane or no walking aids, and 144 patients (59%) used 2 canes or a walker (see table 1). Among survivors at the 4-month and 12-month follow-ups, information on use of walking aids was available for 162 (86%) and 130 (88%) patients, respectively. Of the patients discharged to rehabilitation units, 11 patients (18%) and 5 patients (10%) used no or 1 cane at the 4-month and 12-month follow-

Table 2: Variables Independently Associated With Preserved Walking Ability

Outcome	4 Months		12 Months	
	OR* (95% CI)	P	OR* (95% CI)	P
Discharge to rehabilitation	2.84 (1.16–6.90)	.022	2.83 (1.10–7.26)	.030
Walking ability before fracture	12.19 (5.18–28.66)	<.001	8.98 (3.52–22.93)	<.001

*Adjusted for age, sex, ASA score, fracture type, and surgical method.

ups, respectively. The corresponding numbers for use of 2 canes or a walker were 45 (72%) and 36 (70%), respectively. Six patients (10%) at 4-month follow-up and 10 patients (20%) at 12-month follow-up were wheelchair users. Of the patients not discharged to rehabilitation units, 12 patients (12%) at 4 months and 12 patients (15%) at 12 months used no or 1 cane. The corresponding numbers for use of 2 canes or walker were 59 (59%) and 40 (51%), respectively. Twenty-nine patients (29%) at 4-month follow-up and 27 patients (34%) at the 12-month follow-up were wheelchair users. As shown in table 3, discharge to a rehabilitation unit, major reoperations, major complications, and age were independent predictors of being a wheelchair user at the 4-month follow-up. Surgical method was not ($P=.674$). The model correctly predicted reliance on wheelchair in 78% of patients. At the 12-month follow-up, only discharge to rehabilitation unit and major complications were independent predictors of being a wheelchair user. Again, surgical method was not ($P=.366$). The model correctly predicted the reliance on wheelchair in 72% of patients. The logistic regression analyses were adjusted for age, sex, ASA score, fracture type, walking aids before the fracture, and surgical method at both time points.

Activities of Daily Living

Among survivors at the 4-month and 12-month follow-ups, information on ADLs index was available for 162 patients (86%) and 122 (83%) patients, respectively. Ninety-three patients (57%) at 4 months and 59 (48%) patients at 12 months had preserved ADLs index. Table 4 shows that even here, discharge to rehabilitation units and prefracture ADLs status were significant independent predictors of preserved ADLs index, while surgical method continued to be insignificantly related to outcome: P equal to .088 at 4 months and P equal to .376 at 12 months. The model correctly predicted outcome for 70% of patients at 4 months and 80% at 12 months.

Discharge to Rehabilitation

Logistic regression analysis was used to reveal factors associated with discharge to rehabilitation units. Subsequently, independent living situation (OR=25.6; CI, 11.1–59; $P<.001$) and displaced fractures (OR=4.39; CI, 1.61–12; $P=.004$) were such associated variables, whereas age, sex, ASA score, and walking ability before fracture were not. The model correctly

predicted outcome for 82% of patients. Living situation alone could correctly predict outcome for 81% of patients. The mean length of stay \pm SD for patients discharged to rehabilitation units was 25 ± 10 days, and for the patients discharged directly to the previous living condition, the corresponding length of stay was 8 ± 6 days ($P<.001$).

DISCUSSION

The main conclusion that could be drawn from this study was that cognitively impaired patients older than 65 years with femoral neck fracture, irrespective of type of surgical procedure, were more likely to have preserved walking ability and ADLs index and less likely to be wheelchair users if discharged to rehabilitation units. Not surprisingly, the likelihood of preserving walking ability was also dependent on function prior to fracture. Postsurgical rehabilitation of elderly patients with hip fracture is crucial for regaining prefracture level of function.²¹ However, elderly patients with cognitive impairment and hip fracture are usually excluded from rehabilitation programs because they are not considered good candidates for rehabilitation.^{22,23} Recent studies have challenged this approach. Beloesky et al²⁴ showed that prefracture motor function rather than cognitive level was the most important predictive factor for motor gain after hip fracture. Moreover, cognitive impairment did not significantly affect functional gain in elderly patients with hip fracture if they were referred for rehabilitation.¹⁰ Lenze et al²⁵ verified that the association between cognitive impairment and poor functional outcome in patients with hip fracture was actually mediated via rehabilitation participation, whereas Hershkovitz et al²⁶ showed that the rate of improvement was slower in patients with cognitive impairment than in those without. Moreover, Littbrand et al²⁷ reported that a high-intensity functional weight-bearing exercise program for older people living in institutions is useful, regardless of cognitive function.

Common practice, at least in Sweden, is that subjects already residing in an institution (eg, nursing home) who have a hip fracture are seldom considered for discharge to a rehabilitation unit. One study reported that only 10% of patients admitted from long-term care were discharged to inpatient rehabilitation, compared with 79% of community-dwelling patients,²⁸ which is similar to our findings. Moreover, a study of 183 patients with hip fracture showed that patients with hip fracture from

Table 3: Variables Independently Associated With Wheelchair Use

Outcome	4 Months		12 Months	
	OR* (95% CI)	P	OR* (95% CI)	P
Discharge to rehabilitation	0.26 (0.08–0.83)	.024	0.36 (0.13–0.99)	.049
Major complications	4.07 (1.36–12.14)	.012	5.22 (1.12–24.36)	.035
Major reoperation	5.90 (1.40–24.82)	.015		NS
Age	0.913 (0.84–0.98)	.02		NS

Abbreviation: NS, nonsignificant.

*Adjusted for age, sex, ASA score, fracture type, walking aids before the fracture, and surgical method.

Table 4: Variables Independently Associated With Preserved ADLs Index

Outcome	4 Months		12 Months	
	OR* (95% CI)	P	OR* (95% CI)	P
Discharge to rehabilitation	4.24 (1.61–11.17)	.003	5.33 (1.44–19.65)	.012
ADLs index before fracture	2.03 (1.59–2.58)	<.001	2.51 (1.80–3.50)	<.001

*Adjusted for age and sex.

residential care facilities had shorter hospital stays, less rehabilitation, and less access to physical therapy than patients admitted from independent living. Consequently, more patients from residential care had reduced walking ability postfracture.²⁹ We noticed that prior living situation was the strongest factor related to discharge to rehabilitation units, even after adjusting for relevant confounding factors, and by itself accounted for 81% of variations. This could be explained by a general assumption that patients admitted from institutions need not be considered for rehabilitation programs outside their usual living setting, and therefore such patients were discharged from the acute hospital as soon as they were medically stable. Logically, the assumption would be that it is easier for patients with cognitive impairment to get rehabilitation in a familiar environment. However, the findings of this study show that these patients were less likely to preserve walking ability and ADLs index than patients discharged to geriatric rehabilitation units. Similar findings have been shown by Lenze et al.³⁰ It is reasonable to believe that there is a general lack of rehabilitation capacity, physiotherapists, and knowledge in residential care institutions. The current study also supports previous findings by Munin et al.^{31,32} who demonstrated that patients with hip fracture discharged to inpatient rehabilitation units had superior functional outcome at 12 and 24 weeks compared with patients treated in skilled nursing homes, even after controlling for important covariates. It is likely that patients admitted from residential care facilities are frailer than those who have fractures while living independently, which would also affect long-term outcome.

About one third of the survivors were wheelchair users at the 4-month and 12-month follow-ups. Similar findings were reported by Blomfeldt et al.¹¹ Discharge to rehabilitation units and general major complications were significantly related to reliance on a wheelchair at both time points, whereas major reoperations were only significantly related at the 4-month follow-up. An early healing complication with major reoperation means 2 major traumas to these already fragile patients. On the other hand, patients might have time to recover if reoperation were delayed after 4 months.

Cognitive dysfunction is a feature of both dementia and delirium. In the present study, we defined cognitive impairment as previously diagnosed dementia or cognitive impairment according to a low score (0–2 points) on the SPMSQ. The SPMSQ is a validated instrument for assessment of cognitive function.¹⁴ The most widely used screening test for cognitive function is the MMSE test, which consists of 13 items. It involves manual handling and drawing, which preferably is conducted when the patient is sitting. Therefore, the MMSE is not perfect for assessing cognition in bed-bound patients, such as subjects with acute hip fracture. The SPMSQ has been validated as having a similar sensitivity and specificity to that of the MMSE.^{14,35} Smith et al¹⁹ in a review article concluded that the SPMSQ test is as good a screening test for cognitive impairment as the MMSE. The SPMSQ is simple to administer, the interrater reliability was not considered to be a problem,

and the test-retest reliability has been shown to be very good ($r > .80$).

Previous studies have shown a fluctuation in cognitive function during hospitalization. Strömberg et al³⁴ reported from a study of 256 patients with hip fracture that fluctuation in cognitive function is more pronounced in patients with mild and moderate cognitive impairment than in patients with severe or intact cognitive function at admission. They found that only 2% to 3% of patients with severe cognitive impairment (SPMSQ 0–2) at admission had recovered at discharge. Choosing a low cut-off limit in the SPMSQ makes inclusion of patients with temporary impairment less probable. Moreover, previous studies have shown that using a cut-off limit of less than 3 correct answers is a strong predictor of poor outcome in patients with hip fracture with respect to mortality, walking ability, and ADLs.^{11,35,36}

Discharge to rehabilitation rather than surgical method was the strongest factor associated with preserved walking ability and ADLs index. It is likely that patients with impaired cognitive function have difficulties in coping with their new situation after hip fracture and need more support from a rehabilitation team.

Study Limitations

Certain limitations and strengths of the study need further discussion. Data were collected only from proxies because the patients were selected because of their severe cognitive impairment. No reliability testing of the proxy-given information was performed. Proxy-patient agreement is in general good for concrete observable variables and moderately reliable for subjective variables.^{37,38} Patients discharged to rehabilitation units may differ from those who were discharged directly to their previous living condition. Although to our knowledge we adjusted for factors that might influence the outcome, another limitation of the study could be that data relevant for the decision of discharge to rehabilitation units were not collected. However, the patients were similar in cognitive function, age, sex, ASA score, fracture type, surgical method, and walking ability before the fracture. An alternative design for a study aimed at evaluating the effect of rehabilitation would be a randomized controlled trial. However, this approach might be questionable from an ethical point of view. Consequently, the second best approach is a prospective cohort study including consecutively admitted patients.

One strength of this study was the choice of easily recognizable outcome variables: walking outside, inside, or unable to walk, and Katz ADLs index. Moreover, the dropout rate was fairly low.

CONCLUSIONS

The current results indicate that discharge to a rehabilitation unit, a factor that we can influence, was a significant predictor for preserved walking ability and ADLs index, irrespective of the surgical method. Patients admitted from institutions like

nursing homes and residential care homes were less likely to be discharged to rehabilitation units. This could be because this patient group is different, but it could also be a result of a systematic organizational misconception in which short hospital stays and early discharge are more desirable than the long-term outcome of a vulnerable group of dependent patients. If better functional outcomes could be achieved for hip fractures in patients with cognitive impairment, all patients should receive the same treatment.

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Suppliers

- a. DePuy/Johnson-Jonson, Staffans väg 2, 191 84 Sollentuna, Sweden.
- b. SPSS Inc, 233 S Wacker Dr, 11th Fl, Chicago, IL 60606.