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A hospital based clinical observational study to evaluate the functional recovery and risks of not regaining to the pre-fracture mobility level in elderly patients with hip fractures

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Abstract

Aim: The aim of the present study was to evaluate the functional recovery at six months postoperatively in elderly patients with hip fractures and to determine the risks of not regaining to the pre-fracture mobility level.

Methods: The present study was conducted in the Department of Orthopaedics, Pt BD Sharma PGIMS Rohtak covering pre-fracture and surgical related data. Of the 144 hip fracture surgery patients who attended a routine follow-up at a teaching university hospital, 100 patients met the inclusion criteria.

Results: There were 70 patients walking outdoors independently before hip fracture. Of the 70 patients, only 15 patients reported walking recovery to the pre-fracture state and 11 patients could not walk at all. The numbers of the patient walking outdoors independently, indoors independently, walking in- and outdoors with aids, and not walking at all within 3 to 6 months post-hip fracture surgery were 15 (15%), 18 (18%), 42 (42%), and 25 (25%) respectively. There were significant differences among 2 groups in relation to patients' gender, education, current dwelling place, number of chronic disease, falling place, and use of walking devices before hip fracture. Postoperative walking success was significantly correlated with being male. It was also significantly better in people with graduate-level education and those living at home. There were no differences in BMI, living spouse, number of family members, number of falls, type of hip surgery, LOS before surgery, total LOS, anemia at admission, and pain.

Conclusion: Walking recovery after hip fracture surgery was very poor at 3 to 6 months after hip fracture surgery. Based on our findings, older adults living in a long care facility should be provided their medical and functional needs through professional health-care providers and systematic health delivery systems. The therapeutic management for underlying diseases affecting surgery should precede unconditional early surgery. Older adults hospitalized during longer periods should be focused on their functional care.

Keywords: Hip fracture surgery, walking, post-hip fracture surgery, risk factors, frail elders

Introduction

After experiencing a hip fracture, a significant proportion of patients, approximately 60%, are unable to restore their mobility to the level it was before the fracture occurred^[1, 2]. The deconditioning effect of bed rest and functional decline has been identified as the primary and avoidable cause of loss of independent ambulation in older adults who are hospitalized^[3]. Guidelines for hip fractures at both national and international levels^[4-6], propose multiple interventions aimed at preventing this decline in functional ability associated with hospitalization, including the implementation of early postoperative mobility. Research has demonstrated that early mobilization can reduce the duration of hospitalization and assist in restoring a patient's functional abilities, enabling them to return to their living situation prior to the fracture^[4]. Recent studies indicate that the elderly population, who were able to walk before their fracture, spend more than 80% of their time in bed while hospitalized^[7-10].

In 2011, a group of healthcare professionals at a major urban hospital in Toronto, Ontario, introduced the Bone & Joint National Model for Hip Fracture Care & Toolkit (2011) on a single unit dedicated to post-operative care.

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The Hip Fracture Care & Toolkit was created with the aim of establishing and spreading the most effective methods for treating hip fractures throughout all provinces in Canada.⁶ An analysis of the hip fracture population among older adults in this unit^[10] revealed that early mobility activities are commenced within the first five days following surgery, with varying levels of implementation. A significant number of patients chose not to engage in early mobility activities, particularly among those with a low pre-fracture functional mobility level and those with cognitive impairment. The explanation underlying the absence of patient engagement was not evident; health care provider actions appeared to be in line with suggested use.

Mobility decline emerged as a prominent nursing diagnostic observed in the majority of patients, and it had substantial importance in nursing care. Recognizing the potential negative repercussions associated with decreased mobility, it became vital for nurses to appreciate the notion of mobility and the different elements impacting it. From the first day post-surgery until the patients' release, nursing efforts played a vital role, such as early ambulation, adopting fall prevention methods, and encouraging patients to engage in activities such re-positioning, bed and chair transfers, standing, and walking^[11]. By giving such thorough care, nurses could aid to the rehabilitation of their patients' former mobility levels.

The purpose of the present study was to examine the functional recovery at six months postoperatively in senior patients with hip fractures and to estimate the risks of not returning to the pre-fracture mobility level.

Materials and Methods

The present study was conducted in the Department of Orthopaedics, Pt BD Sharma PGIMS Rohtak covering pre-fracture and surgical related data. Of the 144 hip fracture surgery patients who attended a routine follow-up at a teaching university hospital, 100 patients met the inclusion criteria.

All patients fulfilling the inclusion criteria (>65 years, 3-6 months of postoperative recovery, compos mentis and

communicative).

Patients who showed abnormal fracture healing during follow-up had a previous history of surgery and experienced walking failure before the hip fracture was excluded.

As the primary outcome of the study, self-reported walking status after hip fracture surgery was assessed by a 4-level scale of ambulatory ability¹³: 1 = "able to walk outdoors independently," 2 = "able to walk indoors independently," 3 = "needs assistive devices to walk," 4 = "unable to walk even with assistive devices." Demographics and the number of chronic diseases were collected from hospital medical records. Previous walking status and use of walking device data was collected through interviewing patients during the outpatient period as pre-fracture information. Previous walking status was assessed using the same scale as that used for walking status after hip fracture surgery^[12]. Information related to falling over regarding number of falls and location of falls were collected from the interview. Hospital information including type of hip surgery, LOS before surgery, total LOS, and the lowest hemoglobin value at admission was collected from hospital medical records. In addition, pain and current dwelling place were collected from the interview.

The Statistical Package for the Social Sciences version 22.0 software (SPSS, Chicago, Illinois) was used for the data analysis. We presented the changes in walking status after hip fracture surgery compared to before hip fracture surgery as the numbers, along with the percentage. Bivariate analysis was carried out for the 2 different post-fracture walking status' including walking and not walking even with walking devices. Age, gender, body mass index (BMI), education, living spouse, number of family members, current dwelling place, number of chronic diseases, number of falls, falling place, type of hip surgery, LOS before surgery, total LOS, use of walking devices before hip fracture, anemia at admission, and pain were included in the analysis, being possible independent risk factors.

Results

Table 1: Changes in walking status at 3 to 6 months after hip fracture surgery

	Post fracture Walking Outdoors Independently (n = 15, 15%)	Post fracture Walking Indoors Independently (n = 18, 18%)	Post fracture Walking In- and Outdoors With Aid (n = 42, 42%)	Post fracture Not Walking at all (n = 25, 25%)
Pre-fracture walking outdoors Independently (n = 70, 70%)	15	16	32	8
Pre-fracture walking indoors Independently (n = 19, 19%)		2	8	9
Pre-fracture walking in-and outdoors with aid (n = 11, 11%)			2	8

There were 70 patients walking outdoors independently before hip fracture. Of the 70 patients, only 15 patients reported walking recovery to the pre-fracture state and 11 patients could not walk at all. Of the 19 patients to walk indoors independently preoperatively, 9 patients could not walk at all; 8 patients reported an immobile state in the group

of pre-fracture patients able to walk in- and outdoors with walking devices. The numbers of the patient walking outdoors independently, indoors independently, walking in- and outdoors with aids, and not walking at all within 3 to 6 months post-hip fracture surgery were 15 (15%), 18 (18%), 42 (42%), and 25 (25%) respectively.

Table 2: Comparison of patients' clinical characteristics at 3 to 6 months after hip fracture surgery between groups of walking and not walking at all postoperatively

Variables	Categories	Total Patient Numbers (%) (n = 100)	Numbers of Patients Walking (%) (n = 80)	Numbers of Patients not Walking (%) (n = 20)
Age, years	Average	77.96 ± 7.12	77.14 ± 6.93	80.40 ± 7.27
Gender	Male	34	30	4

	Female	66	46	20
Education, graduation	<Middle school	70	50	20
	≥Middle school	30	30	4
Living spouse	Yes	52	42	10
	No	48	30	18
Number of family members	1	30	22	8
	≥2	70	55	15
Dwelling place	Home	75	60	15
	Long care facility	25	12	13
Chronic disease, number	Average	3.60 ± 1.22	3.15 ± 1.30	3.00 ± 1.30
Number of falls	1	7	5	2
	≥2	93	70	23
Location of falls	Indoors	65	45	20
	Outdoors	35	30	5
Type of hip surgery	Arthroplasty	92	67	25
	Internal fixation	8	7	1
OS before surgery	Average	6.37 ± 5.75	6.71 ± 6.36	5.33 ± 3.17
Total of LOS	Average	17.58 ± 10.76	16.82 ± 9.07	19.87 ± 14.68
Use of walking devices before hip fracture	No	70	60	10
	Yes	30	10	25
Anemia at admission	No	30	22	8
	Yes	70	50	20
Pain	<Moderate pain	75	60	15
	≥Moderate pain	25	15	10

There were significant differences among 2 groups in relation to patients' gender, education, current dwelling place, number of chronic disease, falling place, and use of walking devices before hip fracture. Postoperative walking success was significantly correlated with being male. It was also significantly better in people with graduate-level education and those living at home. In contrast, it was significantly worse in people with more chronic diseases. Patients unable to walk postoperatively experienced significantly more instances of falling indoors rather than outdoors and used walking devices before hip fracture. There were no differences in BMI, living spouse, number of family members, number of falls, type of hip surgery, LOS before surgery, total LOS, anemia at admission, and pain.

Discussion

Standard surgical intervention is employed to enhance both survival rates and physical functionality, although the outcomes frequently prove to be unsatisfactory.^{13,14} The primary measure of functional recovery following hip fracture surgery is the return of walking ability to the same level as before the fracture occurred^[14, 15]. The restoration of ambulatory function is a crucial requirement for elderly individuals residing in a community setting^[16]. Furthermore, elderly individuals perceive functional capacity in everyday activities as a reliable measure of their overall health^[17]. Therefore, walking status as a metric of physical recovery following hip fracture surgery is worthwhile to investigate. Currently, walking recovery following hip fracture surgery to pre-fracture status is poor with about 50% recovering in 6 months and 38.6% in 2 years^[17-19].

Notwithstanding progress in technology and treatment methods, this complication continues to be a significant issue. Because the patients' inability to regain their mobility before the fracture causes limitations in their daily activities, this situation increases the patients' dependence on their environment. In addition, the inability to regain mobility can cause serious medical problems, and the treatment of these problems can lead to serious economic losses^[20]. The prevalence of patients experiencing restricted mobility following a hip fracture varies between 20% and 50%^[21].

There were 70 patients walking outdoors independently before hip fracture. Of the 70 patients, only 15 patients reported walking recovery to the pre-fracture state and 11 patients could not walk at all. Of the 19 patients to walk indoors independently preoperatively, 9 patients could not walk at all; 8 patients reported an immobile state in the group of pre-fracture patients able to walk in- and outdoors with walking devices. The numbers of the patient walking outdoors independently, indoors independently, walking in- and outdoors with aids, and not walking at all within 3 to 6 months post-hip fracture surgery were 15 (15%), 18 (18%), 42 (42%), and 25 (25%) respectively. The rate of walking recovery was much lower than studies from European countries in which approximately 50% patients regained pre-fracture walking status at 3 or 6 months postoperatively^[18, 22]. Furthermore, the rate of post-hip fracture walking failure was almost the same as with patients from Japan, whereas the rate of postoperative walking inability was only 9.2% in patients from the United States^[12]. Delayed partial weight-bearing after surgery has been reported to predict lower walking ability at 3 months after surgery^[12].

There were significant differences among 2 groups in relation to patients' gender, education, current dwelling place, number of chronic disease, falling place, and use of walking devices before hip fracture. Postoperative walking success was significantly correlated with being male. It was also much better in persons with graduate-level education and those living at home. In contrast, it was much worse in persons with more chronic conditions. Patients unable to walk postoperatively experienced considerably higher incidents of falling indoors rather than outdoors and used walking devices before hip fracture. There were no differences in BMI, living spouse, number of family members, number of falls, kind of hip surgery, LOS before surgery, total LOS, anemia at admission, and discomfort. Previous studies^[23, 24] revealed that functional recovery of persons of the Caucasian race was higher than Hispanic and Asian people. However, they^[23, 24] noted that the outcome could not reach a significant conclusion due to a lack of explicit distinctions for race or ethnicity. Thus, studies investigating the influence of race or ethnicity on differences in walking recovery cannot be

confirmed. In addition, health-care delivery systems for hip fracture care may be varied, influencing functional recovery according to race/ethnicity [23, 24].

In this study, one of the risk factors related with not walking at all was present housing place. Patients living in homes may walk well compared to those in long care facilities, consistent with a previous study [18]. Although we did not know how many patients went to rehabilitation hospitals immediately after discharge, they would have already been discharged from the rehabilitation hospitals before 3 to 6 months after hip fracture surgery. This conclusion is understandable considering that older persons (>65 years) live in extended care institutions cannot do independent activities due to physical and functional deterioration and substantial medical demands [25].

Conclusion

The walking recovery following hip fracture surgery exhibited significant impairment at the 3-to-6-month mark. According to our research, it is recommended that older persons residing in long-term care facilities receive their medical and functional requirements from qualified healthcare professionals and well-organized healthcare systems. Prioritizing the therapeutic therapy of underlying disorders that impact surgery is necessary before proceeding with early surgery without any conditions. The primary focus for older persons who experience extended hospital stays should be on providing comprehensive functional care. There is a need to recognize and act upon the risk of poor outcomes in the sub-population of hip fractures that present with multiple risk factors (low pre-fracture function and cognitive impairment, and medical unpredictability). Integration of documentation of a patient's pre-fracture functional status and identification of cognitive impairment on admission can potentially lead to enhanced post-operative care that encourages greater mobility in this population.

Conflict of Interest

Not available

Financial Support

Not available

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