

Study on Walking Ability after Surgery for Proximal Femoral Fracture in Elderly Patients Aged 75 Years or Older

Tsuyoshi Nakai, Atsunori Onishi, Kunihiro Hashimoto, Toshiyuki Nakamura, Naohiro Yasuda, Akira Miyama

Department of Orthopaedic Surgery, Itami City Hospital, Itami, Japan.
Email: tsuyoshi223@gmail.com

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ABSTRACT

Background: Fractures of the hip are the cause of hospitalization in the geriatric population. In many cases, hip fractures are a sentinel event signaling a systemic decline in the patient's health. **Methods:** A retrospective review of the cases of 88 patients aged 75 years or older with proximal femoral fracture was performed. Fracture types, surgical procedures, walking ability before the injury and at discharge, and waiting time from injury to surgery were obtained. **Results:** No significant difference was observed in walking ability before injury among patients with femoral neck fracture treated with bipolar hip arthroplasty (BHA) or open reduction and internal fixation (ORIF) and those with trochanteric fracture. The degree of deterioration of walking ability was 0.6 in patients treated with BHA, 1.2 in those with neck fracture treated with ORIF, and 1.1 in those with trochanteric fracture. Deterioration was significantly less severe in patients who received BHA, compared with those who received ORIF. **Conclusions:** Among the patients aged 75 years or older with femoral neck fracture, those who received BHA had a shorter time interval to the start of walking with parallel assist bars or with walking aids, and also had a higher rate of regaining walking ability.

Keywords: Walking Ability; Proximal Femur Fracture; Elderly Patients

1. Introduction

The incidence of proximal femoral fractures increases yearly as the population ages. According to the National Livelihood Survey conducted by the Ministry of Health, Labour and Welfare, the third most common reason for patients to require any type of nursing care is fall and/or fracture [1]. Among the types of fractures, the most common cause of a bedridden state is femoral neck fracture [1]. Regaining walking ability is vital for elderly persons, and impairment in walking ability is considered to affect mortality. We report an analysis of surgical outcomes in patients aged 75 years or older in terms of walking ability.

2. Subjects and Methods

This study included 88 patients aged 75 years or older with proximal femoral fracture who underwent surgery at our department between January 2010 and June 2011 (19 men and 69 women with a mean age of 85.7 years at the

time of surgery). The following items were examined: fracture types, surgical procedures, walking ability before injury and at discharge, and waiting time from injury to surgery. Fracture types consisted of neck fracture in 50 patients, trochanteric fracture in 36 patients, and subtrochanteric fracture in 2 patients. Neck fracture was treated with bipolar hip arthroplasty (BHA) in 31 patients, total hip arthroplasty (THA) in 2 patients, and open reduction and internal fixation (ORIF) in 17 patients. All patients with trochanteric and subtrochanteric fractures were treated with ORIF. The mean age was 84.8 years in patients with neck fracture, 86.9 years in those with trochanteric fracture, and 87 years in those with subtrochanteric fracture, with no statistically significant difference between groups. These 3 patient groups also showed no significant difference in waiting time (**Table 1**). For assessing walking ability, we used the method developed by Nakajima *et al.* [2] (bedridden state, 1 point; walking while holding on to something or transferring to a wheelchair, 2 points; walking with a walker,

Table 1. Patient characteristic.

Fracture type	No. of Pts. (%)	Mean age (years)	Surgical procedure		Waiting time (days)
Neck fracture	50 (57%)	84.8	BHA	31	5.6
			THA	2	
			ORIF	17	
Trochanteric fracture	36 (41%)	86.9	ORIF	36	4.7
Subtrochanteric Fracture	2 (2%)	87	ORIF	2	6

Table 2. Walking ability before injury and at discharge.

Fracture type	Surgical procedure	Before injury	At discharge	Deterioration degree (before injury at discharge)
Neck fracture	BHA	3.9	3.3	0.6 p < 0.05
	ORIF	4.4	3	1.2
Trochanteric fracture	ORIF	3.8	2.7	1.1

Table 3. Time interval to the start of walking with parallel assist bars or with walking aids.

Fracture type	Surgical procedure	Time interval to walking with parallel assist bars (days)	Time interval to walking with aids (days)
Neck fracture	BHA	2.4	5.2 p < 0.05
	ORIF	3.1	8.6
Trochanteric fracture	ORIF	6.4	11.7

Table 4. Walking ability of patients with trochanteric fracture.

Fracture type			Before injury	At discharge	Deterioration degree (before injury at discharge)
Trochanteric fracture	Stable	13 pts.	3.6	2.5	1.1
	Unstable	23 pts.	3.8	2.5	1.3 p = 0.5

Table 5. Rates of regaining walking ability.

Fracture type	Surgical procedure	Rate of regaining walking ability
Neck fracture	BHA	84%
	ORIF	75%
Trochanteric fracture	ORIF	50%
Total		69%

3 points; walking with a cane, 4 points; and independent walking, 5 points). The degree of deterioration of walking ability was defined as the difference obtained by subtracting the walking ability score at discharge from the score before injury. The rate of regaining walking ability was defined as the proportion of patients who were at least able to walk with walking aids after surgery among those who had at least that level of walking ability before injury. Data were statistically analyzed using a t-test. A P value of <0.05 was considered to indicate a significant difference.

3. Results

No significant difference was observed in walking ability before injury among patients with femoral neck fracture treated with BHA or ORIF and those with trochanteric fracture. The degree of deterioration of walking ability, obtained by subtracting the walking ability score at discharge from the score before injury, was 0.6 in patients treated with BHA, 1.2 in those with neck fracture treated with ORIF, and 1.1 in those with trochanteric fracture. Deterioration was significantly less severe in patients who received BHA, compared with those who received ORIF (p < 0.05; **Table 2**). Moreover, the time interval from the day of surgery to the start of walking with parallel assist bars or with walking aids was significantly shorter in patients who received BHA than in those treated with ORIF. Walking with parallel assist bars was initiated 2.4 days after surgery, and walking with walking aids was started 5.2 days after surgery (**Table 3**). The rates of regaining walking ability were 84% in patients treated with BHA, 75% in those with neck fracture

treated with ORIF, 50% in those with trochanteric fracture, and 69% overall.

4. Discussion

Among our cases, postoperative walking ability was significantly higher in patients who received BHA than in those who received ORIF. According to the report by Kobori *et al.*, BHA causes no pain in 82% of cases and occasional mild pain in 17% after surgery [3]. In our patients treated with BHA, excellent effects against postoperative pain resulted in early ambulation and rehabilitation, which might have contributed to the favorable outcomes. In contrast, Ishiguro report that there was no apparent difference in postoperative walking ability between patients who received BHA and those with trochanteric fracture treated with ORIF [4]. In our study, although the mean age tended to be lower in the patients treated with BHA, no significant difference was observed. Moreover, the fact that the unstable type accounted for 64% of our cases of trochanteric fracture might have contributed to the low postoperative walking ability in our study. However, because there was no apparent difference in walking ability between patients with stable fractures and those with unstable fractures, we consider that further studies are needed (**Table 4**). The overall rate of regaining walking ability was 69%, which seems to be generally favorable in comparison with the rates reported in several other studies (**Table 5**). Some reports show that the rate is 40% to 60% in patients with a waiting time of 1 week or more [5-8], whereas other report shows that the rate is 82% in patients with a waiting time of 3 days or fewer [9]. Although these reports suggest that early surgery is beneficial to regain walking ability, our study did not show any apparent difference between patients with a waiting time of 5 days or fewer and those with a waiting time of 6 days or more.

5. Conclusion

The limitation of current study was small numbers of patients, without consideration of underlying diseases and preoperative biochemical data with the moderate or severe complications that developed during the perioperative period. Among the patients aged 75 years or older with femoral neck fracture, those who received

BHA had a shorter time interval to the start of walking with parallel assist bars or with walking aids, and also had a higher rate of regaining walking ability. We consider that a simple comparison between femoral neck and trochanteric fractures is difficult because of the differences in fracture types.

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