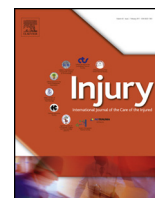




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A comparison of treatment setting for elderly patients with hip fracture, is the geriatric ward superior to conventional orthopedic hospitalization?

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ABSTRACT

Introduction: Hip fractures in the elderly are a major cause of morbidity and mortality. The treatment settings of these patients may change their outcomes. The aim of this study is to compare the outcomes of patients with displaced femoral neck fractures who were admitted to the orthopedic vs. geriatric wards. **Patients and methods:** A retrospective study was conducted on 217 consecutive older patients with 219 displaced femoral neck fractures admitted either to the orthopedic or the geriatric ward between Jan. 2013 and Jun. 2015. Information regarding demographic, medical history, surgical management, hospitalization, and one year readmissions and mortality data was retrieved from electronic charts.

Results: 102 hemiarthroplasty patients were admitted to the orthopedic ward and 117 to the geriatric ward. Patients' characteristics, including age, living arrangements, mobility status and the Charlson Comorbidity Index were similar between groups. Patients from the orthopedic ward had shorter hospitalization time (9 ± 5.1 vs. 10.8 ± 6.7 days, $p=0.022$) and presented a lower in-hospital complication rates (0.6 ± 0.96 vs. 1 ± 1.9 , $p=0.022$), namely fewer events of urinary retentions, urinary tract infections and pneumonias (8.8% vs. 23.9%, $p=0.004$, 3.9% vs. 14.5%, $p=0.010$ and 2.9% vs. 12.2%, $p=0.034$, respectfully). Readmission rates were similar. Neither in hospital nor one year mortality rates differed between groups.

Conclusions: Our study found that geriatric care was not superior to orthopedic directed management in the treatment of elderly patients with hip fractures in terms of in-hospital complications, and hospitalization times.

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Introduction

Hip fractures in the elderly are a major source of morbidity and mortality, when nearly half of the patients do not return to their previous functional level and up to 30% of patients die within the first year following hip surgery [1–5]. The financial burden on health systems is high, and expected to increase with the foreseeable growth in the incidence of femoral fractures [4,6]. The fragility which characterize many of the patients, may result in surgical delay and post-surgical complications and demise. The desire to improve patient outcomes, led to the development of several intervention programs with a different level of geriatric involvement.

Treatment modalities based on geriatric consulting teams for patients with hip fractures were a subject of debate with increased popularity since the 1980s'. Yet, no consent was achieved regarding the efficacy of the programs in reducing mortality, readmission rates, length of stay (LOS) and hospitalization costs [7]. More recent works which reevaluated whether the geriatric consulting teams are beneficial, did not find conclusive evidence supporting these programs [7–11].

A different approach encourages forming of dedicated orthogeriatrics units (OGU), where the orthopedic surgeon and the geriatrician share responsibility for the patient's treatment. This policy exhibited encouraging results in term of decreased time to surgery and in LOS [12] as well as with notable functional scores at four months' follow-up [2,13] and in treatment cost- effectiveness [2]. Still, not all studies found the OGU to be beneficial [9].

As there is no consensus regarding the preferable treatment setting for elderly patients with displaced femoral neck fractures, we wished to conduct a retrospective study comparing the results

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of displaced femoral neck fractures patients treated at the setting of the orthopedic ward with patients who were cared for in a specialized geriatric ward.

Patients and methods

We retrieved data from the medical records of consecutive patients who underwent hemiarthroplasty surgery for the treatment of femoral displaced femoral neck fractures between 01/01/2013 and 30/06/2015.

Demographic information included date of birth and demise, gender, Charlson comorbidity index [CCI], living arrangements, mobility status, and treatment with anticoagulation drugs or bisphosphonates. Hospitalization aspects such as patient's placement, length of stay, time to surgery, blood loss, in hospital complications and pre- and post-surgical laboratory values (hemoglobin, platelets, creatinine and international normalized ratio [INR]) were also collected along with information regarding readmissions in the first year following hemiarthroplasty surgery.

Patients of 75 years and older who underwent hemiarthroplasty for displaced femoral neck fractures during the study period, and were admitted to either the orthopedic ward or the geriatric ward were included. Exclusion criteria were an admission to an alternative hospital ward, or a fracture occurring during acute hospital care.

Upon arriving to the emergency department all patients were clinically assessed by an orthopedic surgeon and pelvic x-rays were performed. Following the diagnosis of displaced femoral neck fractures, eligible patients were assigned either to a specialized geriatric ward or to the orthopedic ward for preparation to surgery. The decision regarding patient's placement was performed based on vacancy in the geriatric ward. When the ward was fully occupied patients were admitted to the orthopedic ward. Patients

on the orthopedic ward were prepared by the orthopedic surgical team with a medical consultation as needed from our internal medicine colleagues. The patients on the geriatric ward were prepared by the geriatric team.

Following surgery, all patients were supervised in the orthopedic ward for up to 24 h. Later, patients who were admitted to the geriatric ward were transferred back to geriatrics care until discharge. Medical consultations were available for the orthopedic surgeons by an internal medical physician upon request. Similarly, there was a daily orthopedic ward round in the geriatric ward for the specific purpose of post-operative wound monitoring and orthopedic consultation as needed. Early mobilization was encouraged on postoperative day 1 in both groups and physical therapy was part of the routine care in both departments. Thrombophylaxis treatment protocol was the same for both groups.

The primary outcome is one-year mortality. Secondary outcomes measurements include time to surgery, length of stay, in hospital complications and mortality and readmission rates, for any cause, in the year following surgery.

Statistical analysis

Continuous variables are presented with mean and standard deviation (SD). Quantitative variables are presented with absolute and relative frequencies. Fisher's exact test and χ^2 test were used for comparison of proportions. Student's *t*-test were used to compare means of numeric variables between groups. A logistic regression model was used to demonstrate how patients' variables influence readmission rates within 1-year. All reported *p*-values are two-tailed. Statistical significance was defined as *p* < 0.05.

This study was approved by the institutional ethical review board.

Table 1
Patients baseline characteristics.

		Orthopedic ward (n = 102)	Geriatric ward (n = 117)	<i>p</i> . Value
Age (SD)		83.6 (5.8)	84.9 (5.7)	0.090
Gender (%)	Female ^a	65 (63.7)	61 (52.6)	0.101
Living arrangement (%)	Independent	67 (65.7)	75 (64.1)	0.453
	Care giver at home	24 (23.5)	23 (19.7)	
	Nursing home	11 (10.8)	19 (16.2)	
Mobility (%) ^b	Independent	56 (56.6)	57 (49.6)	0.648
	Cane	16 (16.2)	26 (22.6)	
	Crouches	1 (1)	0 (0)	
	Walker	25 (25.3)	29 (25.2)	
	Wheel chair	1 (1)	2 (1.7)	
	Bed ridden	0 (0)	1 (0.9)	
Charlson co-morbidity index	1-year survival	80.9 (11.6)	81.3 (10.9)	0.784
	10 years' survival	34.9 (31.8)	33.2 (31.4)	0.700
Depression		9 (8.8)	7 (6.0)	0.447
Smoking status (%) ^c	Non smoker	70 (77.8)	99 (87.6)	0.073
	Past smoker	8 (8.9)	8 (7.1)	
	Current smoker	13 (14.4)	6 (5.3)	
Anticoagulation use (%)	Warfarin	8 (7.8)	14 (12.0)	0.753
	Novel Oral Anti Coagulation drugs	1 (1.0)	4 (3.4)	
	Low Molecular Weight Heparin	0 (0)	1 (0.9)	
Laboratory evaluation	Hemoglobin (g/dl)	12.3 (1.4)	12.5 (1.6)	0.258
	Platelets (K/ μ L)	230.5 (79.1)	220.7 (78.2)	0.360
	INR	1.1 (0.4)	1.2 (0.5)	0.666
	Creatinine (mg/dl)	1.2 (1.1)	1.0 (0.4)	0.030

^a In the geriatric group 1 female patient was operated upon both legs. One male patient who also underwent 2 surgeries was admitted for a different ward after each femoral fracture.

^b Data was unavailable for 3 patients from the orthopedic group and for 2 patients from the geriatric group.

^c Data was unavailable for 11 patients from the orthopedic group and for 4 patients from the geriatric group.

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