

The "Sheba" Model of Comprehensive Orthogeriatric Care for Elderly Hip Fracture Patients: A Preliminary Report

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Key words: elderly, hip fractures, orthogeriatrics, rehabilitation

Abstract

Background: The progressive increase in the number of elderly patients with hip fractures and the particular multidisciplinary needs of this population call for the investigation of other models of orthogeriatric care.

Objectives: To describe the nature and assess the feasibility of a comprehensive orthogeriatric unit attending to patients' surgical, medical and rehabilitation needs in a single setting.

Methods: This retrospective chart review describes consecutive older patients with hip fractures admitted directly from the emergency ward to an orthogeriatric ward.

Results: The mean age of the 116 patients evaluated was 82.4 years. Delay to surgery was 3.6 ± 3.1 days and total length of stay 23.9 ± 11.0 days. No patient was transferred to other acute medical wards of the hospital and 66.4% were able to return to their previous living place. Rates of major complications and mortality were extremely low.

Conclusion: The present model of a comprehensive orthogeriatric ward is a practical, applicable and feasible service for elderly hip fracture patients and can cover the various needs of these patients. The deployment arrangements needed to establish and operate the ward were minimal and there were only a few management and organizational problems. The cost-effectiveness and other comparative benefits of this type of service have yet to be clarified.

IMAJ 2002;4:259-261

Hip fractures constitute a leading cause of hospital admissions and prolonged length of stay among the elderly. They are associated with functional impairments and major disabilities and result in high rates of subsequent institutionalization and mortality. The economic and social burden of such fractures is expected to increase dramatically [1], but financial resources remain limited. This calls for the investigation of innovative new forms of organization and integration of medical, surgical and rehabilitation services for these patients. Until now, the usual course in such patients included admission to an orthopedic ward, liaison with internal medicine or geriatric physicians, and transfer to a rehabilitation setting.

The establishment of orthogeriatric wards [2-7] has been described as a success by many authors. However, most of these units reflect a limited degree of geriatric and orthopedic liaison and their effectiveness has been questioned [8,9]. The increasing pressure of elderly patients with hip fractures prevents departments of orthopedic surgery from performing more non-traumatic elective surgery as well as other major traumatic surgery. We have therefore

established a unique form of orthogeriatric ward, designed to take care of hip fracture patients throughout their hospital stay. Such a facility enables the provision of appropriate medical, surgical and rehabilitation needs during the long and complex treatment of these elderly patients. This is in contrast to the previously mentioned forms of orthogeriatric settings in which geriatric physicians were either integrated into the orthopedic wards or patients were transferred to a geriatric facility specializing in early rehabilitation of such patients usually 48-72 hours after surgery.

The purpose of this report is to describe the nature and organization of a new approach to orthogeriatric care and to describe our preliminary experience with the first 129 consecutive admissions, 116 of whom underwent surgery. The possible future implications of this approach are discussed.

Patients and Methods

Patients

The pilot orthogeriatric ward was set up in June 1999. No active publicity was carried out for this ward. The analyses included the first 129 consecutive hip fracture patients, aged 60 years or older, admitted to the Center of Geriatric Medicine and Rehabilitation. We included only patients referred directly from the emergency ward of our medical center to the geriatric wards with the primary inclusion criterion of a fractured hip. Patients admitted for elective hip surgery due to osteoarthritis were excluded, as were patients admitted for rehabilitation in the orthopedic wards following surgery. The presence of other acute disabilities (e.g., other fractures) or other acute medical problems (concurrent febrile disease, stroke, etc.) did not exclude the patients, nor did their cognitive level.

Setting and procedure

The Geriatric Center at Sheba Hospital is a 180-bed facility comprising six medical geriatric wards and is part of a large tertiary general medical center, which is a level I trauma center. An orthogeriatric unit with 15 beds was established, and a team of orthopedic surgeons was integrated with the staff and treatment protocols of the geriatric center. The patient is admitted directly from the emergency room, evaluated and prepared for surgery, transferred to the operating room and then returned to the orthogeriatric ward. All patients are followed daily by the surgeon until complete wound healing, and by the geriatric and rehabilitation staff until discharge from the ward.

The ward uses an interdisciplinary rehabilitative team approach and staff members meet twice a week to evaluate the status of each

* Deceased

patient. A treatment plan is established and monitored with the purpose of coordinating and integrating the various aspects of staff activities (medical, nursing, physical and occupational therapy, social work and geriatric psychology). After surgery these patients usually receive a mean of 5 hours per week of physical and occupational therapy.

Data analysis

Data were analyzed using the SAS software, and included age, gender, and time interval from fracture to admission, from admission to surgery and from surgery to discharge. In addition, we evaluated the referral source (pre-fracture habitat) and discharge destinations, as well as type of fractures, procedures and complications.

Results

During a 9 month period 129 patients were admitted. The mean age of the patients was 82.5; 73% were females and 87.9% lived in the community. Conservative treatment was applied in 13 cases depending on the nature of the fracture and the patients' general condition. These patients were transferred to a long-stay rehabilitation center or to nursing homes. The general characteristics of the remaining 116 patients who underwent hip surgery and data regarding type of fractures and surgical procedures are shown in Table 1.

The great majority of patients fell at home. Minor medical and reversible complications developing during hospital stay were observed in 42% of patients and included paroxysmal atrial fibrillation (2 patients), angina or myocardial infarction (2 patients), exacerbation of congestive heart failure (3 patients) or chronic lung disease (one), deep vein thrombosis (4 patients), urinary tract infection (14 patients), urinary retention (9 patients), pneumonia (10 patients), local skin infection (10 patients) and delirium (19 patients). Urinary incontinence was present upon discharge in 22% (25 patients) and pressure sores in two patients. This seemingly high rate may be explained by the strict monitoring of complications, which are frequently overlooked. The rate of major medical and surgical complications was 2.6%, and included sepsis following dislocation of an infected prosthesis, a case of post-operative stroke, and another technically failed hemi-arthroplasty. The in-hospital mortality rate was extremely low (0.8%, one patient).

The observed in-hospital delay (from admission to surgery) was 3.6 days, which was due mainly to operating room availability since hip fractures in this medical center are traditionally defined as low priority cases. This is similar to the mean length of stay of elderly hip fracture patients treated during 1999 in the acute care hospital. Forty-five percent of the patients in the orthogeriatric unit underwent surgery within the first 2 days after admission, as compared to 38.4% in the general acute care hospital. The mean surgery to discharge interval was 20.3 days, twice as long as that in the general hospital; however, in the orthogeriatric unit this included a structured rehabilitation program. The mean length of hospital stay [Table 2] was 23.9 for the operated sample (116 patients), 25.5 days for those who underwent a full rehabilitation course (90 patients), and 18.1 days for those with non-weight-bearing fractures who were transferred to a long-stay rehabilitation center (26

Table 1. General characteristics of patients, fractures and surgical procedures

No. of patients	116
Age (yr)	
Mean \pm SD	82.45 \pm 6.68
Range	63–97
Gender	
Females	85 (73.3%)
Males	31 (26.7%)
Pre-fracture habitat	
Own home	102 (87.9%)
Nursing facility	14 (12.1%)
Place of fall	
At home	97 (83.6%)
Out of home	19 (10.3%)
Fracture type	
Extracapsular	78 (67.2%)
Intracapsular	38 (32.8%)
Side	
Left	57 (49.1%)
Right	59 (50.9%)
Associated fractures	9 (8.6%)
Procedure	
Nailing	78 (67.2%)
Hemi-arthroplasty	33 (28.44%)
Pinning	5 (4.3%)
Post-surgery hip stability	
Full weight bearing	85
Non-weight bearing	26
Partial weight bearing	5
Complications	
Minor	49 (42.2%)
Major	3 (2.6%)
In-hospital mortality	1 (0.8%)

Table 2. Stays (days) and placement outcomes of patients

Admission to surgery interval	3.6 \pm 3.51
Surgery to discharge interval	20.3 \pm 10.6
Total hospital stay	23.9 \pm 11.08 (range 7–61)
Discharge destination	
Pre-fracture habitat	79 (66.4%)
Nursing home	30 (25.9%)
Other facilities	6 (5.2%)

patients). Overall, 66.4% returned directly to their pre-fracture living environment, 25.9% to nursing homes and 5.2% to long-stay rehabilitation facilities.

Discussion

This is the first description of a new model of a comprehensive orthogeriatric care ward with an integrated approach that is feasible for older people with hip fractures. In view of the increasing financial burden that hip fracture treatment imposes on healthcare resources, this program has the potential to reduce long-term expenses related to the care of such patients. Moreover, it will resolve the tertiary referral center's logistic problem of shortage of acute care beds for multi-trauma cases requiring immediate surgery. We consider this experience important for its originality

and relevance to the growing elderly population. This unique collaborative venture did not utilize any additional facilities and is the result of a reorganization of existing resources.

The approach we have adopted offers several advantages. First, it abolishes the need to relocate older patients among various departments of the hospital, which may be critical for elderly hip fracture patients who are highly prone to develop delirium and other complications associated with maladjustment and disorientation. A stay in a single ward is appropriate in the sense that these are patients with multiple co-morbidities who need to be treated not only for their fracture but also for other medical, cognitive and functional problems. The patient receives the attention of a knowledgeable and caring staff attuned to the special needs of the elderly, which could lead to better recognition of both medical and surgical problems arising during the hospital stay. Second, the patient benefits from early rehabilitation and close supervision by the same multidisciplinary staff members during the entire hospital stay. Third, it minimizes the use of orthopedic beds by large numbers of elderly hip fracture patients and creates more space for elective or emergency procedures that can be performed solely in orthopedic wards. It therefore enables optimization of the orthopedic service by hospitalizing younger multi-trauma patients and complicated multi-trauma patients for better acute care. Lastly, it creates and stimulates professional interest in a specific group that is often considered too complex and too tedious by many medical and paramedical professionals.

An important point concerns the arrangements of the local health maintenance organizations. Payment per hospitalization day in geriatric departments is approximately 60% of that in general orthopedic wards, while the surgical procedures (that are disease-related group-based payments to the hospital) are prospective and fixed, leaving the hospital with greater profits. We believe that further studies are needed for a detailed cost-benefit analysis that will take into account other relevant parameters of the project, such as changes in morbidity and mortality, earlier discharge of patients, and better rehabilitation outcomes. The costs of the program involve a slightly greater resource input due to more intensive physician and nurse shift work. However, we believe that this increase is relatively marginal and that the project will ultimately prove to be cost-effective.

A few problems were observed during the implementation of this program and type of care. One of these was obtaining the cooperation of anesthesiologists, who tended to require a more intensive preoperative investigation and frequently asked for additional cardiac and respiratory investigations, thus prolonging the time interval between admission and surgery. However, considering the hospital's "traditional" late afternoon and night surgery for many of our patients, and the relatively high proportion of junior anesthetic and surgical staff involved in surgery, we have generally accepted their requests for more detailed preoperative studies. In order to avoid mistreatment, we referred high risk patients for surgery during the morning hours. Moreover, high risk patients undergoing surgery during late hours were routinely kept for longer periods in the recovery room (up to 12 hours) before being re-admitted to the ward.

Obtaining consent from the patients and their families proved to be an important factor in the delay of surgery, since many of the patients lacked the capacity to provide informed consent. This necessitated a judicial procedure for guardianship, which was usually obtained within 24–48 hours. Additionally, since a significant number of patients had no close relatives a longer period was needed to arrange post-hospital placement.

Another problem concerned the educational aspect of the entire process. Being a new and unfamiliar approach, it took some time to convince the patients and their families that the patient need not necessarily be admitted to an orthopedic ward. However, with time, the arrangement became natural and raised no particular issues. Moreover, the model constituted a valuable teaching tool for physicians and other staff members involved in this project.

To conclude, this study addresses an important topic in geriatrics. This new deployment modality offers many advantages both to elderly patients with hip fracture and to the hospital as an independent economic-based center. The cost-benefit of this modality has yet to be determined. An ongoing study investigating the efficacy of this model is underway, and results comparing data of a "classic" orthopedic ward will be available later this year. In addition, future evaluation will seek and identify factors relevant to the medical, surgical and rehabilitation aspects of this innovative program.

Acknowledgment. We would like to thank the staff members of the Department of Geriatric Rehabilitation for their cooperation, and A. Ziv and A. Pearl from the Health Service Research Unit for their assistance in preparing this report.

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