Non-emergency management of hip fractures in older patients

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ABSTRACT

Purpose. To evaluate the effects of a policy change from emergency to scheduled management of hip fractures in older patients.

Methods. 91 and 107 patients aged 50 years or older with hip fractures were scheduled for operation on the emergency and orthopaedic lists, respectively. Cancellation rates, consultant supervision rates, after-hour operation rates, 30-day mortality, and preoperative and total length of hospital stay were compared.

Results. When older patients with hip fractures were scheduled on orthopaedic lists rather than emergency lists, the cancellation rates owing to lack of theatre time (4% vs 54%, p<0.001), the supervision rates (45% vs 24%, p=0.002), and after-hour operation rates (1% vs 25%, p<0.001) were significantly better. The 30-day mortality rates decreased from 4.4% to 1.9% (p=0.3). The median preoperative length of hospital stay significantly increased from 2 to 4 days (p=0.046), but the increase in total length of hospital stay was non-significant (6 to 10 days, p=0.14).

Conclusions. Non-emergency management of hip fractures in older patients resulted in fewer cancellations and after-hour operations, and increased consultant supervision. Nonetheless, extra time slots for operating theatres are required to avoid an associated increase in preoperative and total length of hospital stay.

Key words: fracture fixation; hip fractures; length of stay; mortality; operating rooms

INTRODUCTION

Hip fractures in elderly patients are a major burden on hospital resources. Operative delays are common because of competition for limited operating theatre time.1,2 Early surgery improves outcomes in older patients with hip fractures,3–8 but this finding is not
consistent. It is generally agreed that patients should undergo surgery within 3 days of injury to minimise hospital stay, pain and perioperative complications such as pressure sores and venous thromboembolism.

Most operative delays are due to lack of theatre time rather than medical reasons. Despite efforts to fast track these patients, their median preoperative length of hospital stay (the time between admission and surgery) and cancellation rate remain high, because more urgent cases take priority. Cancellations are associated with extended fasting times and dissatisfaction among patients and relatives. In addition, emergency operations outside of working hours are less likely to be supervised by consultants.

We instituted a new policy for older patients with hip fracture by booking the operating theatre on the next available orthopaedic list instead of the emergency list, and compared the effects of the 2 policies.

**MATERIALS AND METHODS**

Our institution is a major trauma centre and manages over 200 hip fractures in older patients per year. These patients were usually put on emergency lists, in which time slots for the operating theatre are limited and shared with all specialties, including obstetrics. A senior nurse, in consultation with the anaesthetic and surgical teams, prioritises cases based on urgency.

A pre-post controlled intervention study was conducted from October 2006 to October 2007. The ethics committee of the hospital approved this study. Patients aged 50 years or older who underwent surgical treatment for hip fractures were included. In the first 6 months, 91 patients were put on the emergency lists (pre-intervention group). In the next 6 months, 107 patients were put on the next available orthopaedic lists (post-intervention group). During this period, extra orthopaedic lists were provided to cover the increase in demand.

Comparisons between groups were made on the demand for theatre time (the number of cases requiring treatment per week), the supply of theatre time (the number of lists available per week), the preoperative length of hospital stay (time between admission and surgery), the total length of hospital stay (time between admission and discharge), the cancellation rate (the number of cases cancelled divided by the number of cases completed), the supervision rate (the proportion of operations supervised by a consultant), the 30-day mortality rate, and the after-hour operation rate (1800–0800, Monday to Friday, all weekends and public holidays).

Comparisons between groups were made using the Chi squared test for proportions, Student’s t-test for continuous normal data, and the Mann-Whitney U test for non-normal continuous data. All data were collected prospectively as part of routine practice and measurement of key performance indicators.

**RESULTS**

Of 214 hip fractures, 16 were managed non-operatively and excluded (4 and 12 in the pre- and post-intervention groups, respectively). Reasons were refusal of surgery (n=8), lack of medical fitness (n=5), bed bound in residential homes (n=2), and transfer to another hospital (n=1). The preoperative comorbid status of patients was not significantly different between groups (mean patient age: 78 vs 80 years; sex: 61 males and 30 females vs 76 males and 31 females; mean American Society of Anesthesiology score: 3.0 vs 3.0).

In the pre- and post-intervention groups respectively, the mean numbers of operations per week were 3.7 and 4.2 (p=0.33), the mean all-cause cancellation rates were 77% and 28% (p=0.001), the cancellation rates owing to lack of theatre time were 54% and 4% (p<0.001), the median preoperative length of hospital stay was 2 and 4 days (p=0.046), the median total length of hospital stay was 6 and 10 days (p=0.14), the supervision rates were 24% and 45% (p=0.002), the 30-day mortality rates were 4.4% and 1.9% (p=0.30), and the after-hour operation rates were 25% (n=23) and 1% (n=1) [p<0.001].

During the post-intervention period, a mean of 6 (range, 1–10) scheduled operating lists were provided per week. There was a trend toward shorter preoperative length of hospital stay with increased theatre availability (p=0.16).

**DISCUSSION**

When older patients with hip fractures were scheduled on orthopaedic lists rather than emergency lists, the cancellation rates, supervision rates, and after-hour operation rates improved significantly. The association between operative delay and mortality is inconsistent. A meta-analysis concluded that surgery for hip fractures after 48 hours resulted in increased mortality. Nonetheless, most studies included were retrospective and not adjusted for comorbidity. This allowed healthier patients with better outcomes to be selected for earlier surgery. There is an association
between operative delay and suboptimal outcome in patients with hip fractures. In a study examining the Finnish registry, retrospective data on the effect of operative delay on outcome was found to be prone to serious bias, as heterogeneity existed between health services. In 2 prospective studies, no significant association was found between mortality and operative delay of <4 days or early surgery. In another study, operative delay of >2 days was significantly associated with an increase in mortality, but the effect became non-significant when the severity of comorbidity was controlled. In our study during the post-intervention period, there was a trend toward reduction in 30-day mortality even when the preoperative length of hospital stay increased. Our 30-day mortality rates compared favourably with those in other studies (varying from 7 to 9%) and our previous experience (7.2% in 2002 to 2004 and 7.3% in 2006).

Reduction in mortality may be due to medical optimisation. Patients with major medical abnormalities that were corrected prior to surgery had the same complication rate as those without abnormalities. It may also be due to a decrease in the cancellation rate and thus unnecessary repeated fasting. Up to 58% of hip fracture patients have evidence of protein depletion and hence worse outcomes. The increase in consultant supervision rate also benefits patients. In our study, only one operation scheduled on the orthopaedic lists was performed outside of working hours, compared to one in 4 on emergency lists. Surgery performed during normal working hours is associated with lower complication rates.

In our study, an increase in time slots for operating theatres reduced the preoperative length of hospital stay. There may be financial benefits to early surgery, as increased costs devoted to early surgery may be offset by improved patient outcomes.

This study was limited mainly by its non-generalisability. Extra resources must be provided to obtain the benefits of placing older patients with hip fractures on orthopaedic lists. Considering the projected impact of patients with hip fractures on health services, further study is warranted on the costs related to provision of extra lists and the savings associated with improved outcomes.

CONCLUSION

When older patients with hip fractures were scheduled on orthopaedic rather than emergency lists, cancellation and supervision rates improved significantly, without affecting mortality rates adversely. Nonetheless, extra time slots for operating theatres is required to avoid increasing in preoperative and total length of hospital stay.

REFERENCES