Outcome after conservatively managed intracapsular fractures of the femoral neck

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ABSTRACT

INTRODUCTION In 2012, 2.6% of hip-fracture patients in the UK were treated conservatively. There is little data on outcome for these patients. However, one study demonstrated that though 30-day mortality is higher, mortality over the rest of the year is comparable with that in surgical groups. Therefore, we assessed conservatively managed patients in our unit.

METHODS Patients with intracapsular fractures of the femoral neck treated by conservative means between 2010 and 2012 inclusive were identified. Data were collected: American Society of Anaesthesiologists (ASA) grade, Nottingham Hip Fracture Score (NHFS), mobility, mortality (30 days and one year) and pain levels.

RESULTS Thirty-two patients formed the study cohort. Mean age was 85.6 years. Median ASA grade was 4. Mortality at 30 days and one year was 31.3% and 56.3%, respectively. There was one case of pneumonia and one of infection. Pressure sores or venous thromboembolism were not documented. Three patients underwent surgery once their health improved. In general, mobility was decreased, but 30.8% of patients could mobilise with two aids or a frame. Only two cases had ongoing problems with pain.

CONCLUSION Our data are similar to those published previously. Our patients were likely to have higher mortality data due to selection bias. Thirty-day mortality was significantly higher than the national average, but patients surviving 30 days had a prevalence of mortality similar to those managed by surgical means. Despite mobility decreasing from the pre-admission status, a considerable number of patients were free of pain and could mobilise. These data suggest that conservative management of intracapsular fractures of the femoral neck can produce acceptable results.

KEYWORDS

Intracapsular fracture – Conservative management – Outcome – Mortality – Pain control

Accepted 9 June 2014

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Fractures of the neck of the femur affect 70,000–75,000 people per year in the UK.¹ The National Institute for Health and Clinical Excellence (NICE) have published guidelines for management of these fractures in the UK. These guidelines recommend that patients should be treated surgically wherever possible. Patients receiving optimal treatment have a prevalence of mortality of 10–20% at 30 days and 50% at one year.^{2–6}

Literature reviews have demonstrated that, in routine cases, surgical intervention has better outcomes than conservative treatment in terms of duration of stay in hospital, mobilisation, and return to independent living.⁷ The Cochrane Review recommended that patients who are sufficiently fit should undergo surgical management.⁷ This strategy has been incorporated into national guidelines.¹

Despite best-practice recommendations suggesting that all patients should undergo surgery, there remains a small subset of patients deemed too unfit to undergo surgical intervention. Such lack of fitness is usually due to comorbidities. Data from the UK National Hip Fracture Database (NHFD) suggest that 2.6% of patients with fractures of the

femoral neck are treated by conservative means.⁵ It is often thought that patients undergoing non-surgical management for fractures of the femoral neck have significantly worse outcomes with significant pain, poor mobility, and multiple complications.

Studies on the natural history and outcomes of patients undergoing non-surgical management for fractures of the femoral neck are lacking. One study by Gregory *et al.*⁸ demonstrated that results were not as bad as thought previously. Therefore, we assessed the outcomes of patients treated non-surgically at our unit over a three-year period.

Methods

NHFD data were used to identify all patients admitted to Wrexham Maelor Hospital (Wrexham, Wales) between 2010 and 2012 listed as being managed by non-surgical means. NHFD data, radiographs and case notes were then reviewed. Data were collected: comorbidities, pain, mobility, living arrangements, complications, mortality, and follow-up. Patients identified incorrectly as being treated

by conservative means were excluded. Often, these were patients who were transferred to a tertiary centre for surgery (eg pathological fractures). Patients who refused surgery were also excluded because our aim was to assess outcome in patients in whom the decision was made to treat them by non-surgical means due to comorbidities. The number of extracapsular fractures treated conservatively was small ($n=5$) so we have not presented these data because they are not sufficient to produce meaningful analyses. Data were then analysed and outcomes compared with patients treated by surgery from NHFD data.

Results

Over a three-year period, we identified 642 patients admitted with fractures of the femoral neck. NHFD data were used to identify 51 patients listed as being treated conservatively over this period. Of these, 19 patients were excluded: seven patients were transferred to another centre for surgery due to pathological fractures; four patients died before planned surgery or before a decision was made whether to operate (often due to major comorbidities); two patients refused surgery; one patient was thought to have had a previous fracture; five patients had extracapsular fractures. Hence, 32 patients were treated conservatively in our unit (5% of our admissions). Of these 32 patients, case notes were unavailable for six patients and their data are included only for mortality figures, not for mobility or complications. Thus, we had 26 patients for whom a full dataset was available and who were treated conservatively in the three-year period.

Of the 26 patients (7 males and 19 females; mean age, 85.6 (range, 52–102 years), 12 had undisplaced intracapsular fractures and 14 had displaced intracapsular fractures.

Median American Society of Anaesthesiologists (ASA) grade was 4. We calculated the Nottingham Hip Fracture Score (NHFS) for these patients: the mean was 22% and the median was 19%.

Of the 32 patients (including those with missing case notes), 15 had undisplaced fractures and 17 had displaced intracapsular fractures. There were 8 males and 24 females with a mean age of 83.1 (range, 52–102) years. There were multiple comorbidities (acute or chronic) within this patient group. Breakdown of the number of comorbidities per patient is shown in Figure 1, which demonstrates that most patients had multiple comorbidities. Sixty-nine percent of patients had some form of cardiac comorbidity and 54% had a respiratory comorbidity.

When assessing the prevalence of mortality, seven patients (21.9%) died during hospital admission. Thirty-day mortality was 31.3% and one-year mortality was 56.3% (Table 1). Of these patients, 12 (46.0%) had an ASA grade of 4. Thirty-day mortality for this group was 66.7%.

In comparison, 30-day mortality for surgically treated patients with intracapsular fractures over the same three-year period was 6.3% and one-year mortality was 10.5% (Table 1). Of these patients, 44 (14.0%) had an ASA grade of 4, of whom six died within 30 days, thereby giving a 30-day mortality of 13.6%.

Of the patients who did not die during hospital admission, only six patients (30%) remained in an acute hospital setting for >2 weeks. Forty-five percent of subjects returned to their own home or the residential care setting that they were admitted from. Forty percent of subjects were discharged to a community hospital or rehabilitation centre for further physiotherapy (40%).

We were able to determine the pain level upon hospital discharge for 18 of the 20 surviving patients. Sixteen

Figure 1 Number of comorbidities per patient for the study cohort

Table 1 Mortality at 30 days and at one year for the study cohort

	Thirty-day mortality	One-year mortality
Surgical management	6.3%	10.5%
Conservative management	31.3%	56.3%

patients (88.9%) were free of pain or had pain controlled with analgesia, and two (11.1%) had ongoing pain despite analgesia. Data were available for six patients after hospital discharge: five cases had no pain or controlled pain, and no pain was documented for the remaining patient.

Before the fracture, seven patients (27.0%) were independently mobile with a further eight patients (30.8%) using one aid and seven patients (27.0%) using two aids or a frame. Two patients (7.7%) were wheelchair users or did not mobilise. After conservative treatment of those patients who survived to hospital discharge, seven (27.0%) could not mobilise or were using a wheelchair, four (15.4%) could walk with aids and supervision, and eight (30.8%) were mobilising with two aids or a frame. Mobility for the remaining patient was not recorded. Follow-up data were available for six patients: one was mobilising with no aids (after being discharged mobilising with two aids and supervision) and three were mobilising with two aids or a frame (Table 2).

Only two complications were documented in this group. One patient developed hospital-acquired pneumonia and the other developed sepsis of unknown source. Both patients survived >30 days from the diagnosis of their injury. Pressure sores or venous thromboembolic events were not documented.

Three patients underwent surgery at a later date. One underwent surgery after an additional fall that caused displacement of the initial fracture. Another patient had ongoing issues with pain control after hospital discharge. The other case was found to have a symptomatic non-union at follow-up (Table 3).

Table 2 Mobility levels before and after fracture

Mobility	Pre-injury	Before hospital discharge	At final follow-up
Independent	7	0	1
With one aid	8	0	0
With two aids or a Zimmer frame	7	8	3
With aids and supervision	2	4	0
Wheelchair user/unable to mobilise	2	7	0
Not known	0	1	2

Table 3 Summary of results

Parameter	
Number of patients	31
Mean age (years)	85.6
Mean number of comorbidities	3.97
Mean value for NHFS	22%
Thirty-day mortality	31.3%
One-year mortality	56.3%
Patients pain free or with controlled pain at final follow-up	88.9%
Patients mobile with a frame or better at final follow-up	46.2%
NHFS, Nottingham Hip Fracture Score	

Discussion

NICE guidelines quote the mean mortality for fractures of the femoral neck to be 10% at 30 days and 30% at one year. Hence, mortality between 30 days and one year is 20%. Our retrospective analyses demonstrated that patients with intracapsular fractures of the neck of the femur managed conservatively had higher mortality at 30 days than those managed by non-surgical means. However, the difference in mortality from 30 days to one year was similar to that observed for those treated by surgical intervention. This finding is despite the fact that these patients had more comorbidities and higher ASA grades. We also demonstrated acceptable levels of pain, mobility and complications in this group of patients.

The strength of this study is that it provides data for a rarely studied subject. A Cochrane Review in 2008 included only one small randomised trial on intracapsular fractures that was deemed to be 'potentially biased'.⁷ A recent study by Gardener *et al.* found that patients treated conservatively had reasonable outcomes compared with those treated by surgery.⁸ Also, because part of these data were collected prospectively, the strength of our analyses was increased. Furthermore, we obtained follow-up data. Also, there was a relatively large number of patients included for a study assessing patients treated conservatively.

Our study was hampered by its retrospective nature. Unlike the two other studies mentioned above, our patients were not followed up routinely. Therefore, we did not have routine data on long-term pain and mobility unless that patient was reviewed subsequently. These data would have improved our study.

Treating patients by conservative means remains a controversial issue in fractures of the femoral neck. However, there is a subset of patients who are deemed unfit for surgery. There is little information on the natural history and outcome for these patients. It is often thought that patients treated by non-surgically means fare poorly with considerable levels of pain, poor mobility, and a high prevalence of

complications. Furthermore, it is felt that they suffer a high prevalence of mortality.

There was an inherent selection bias in the group of patients treated by non-surgical means. This group of patients was selected due to their considerable comorbidity. NICE guidelines and data from the NHFD state that the mean prevalence of mortality for patients with femoral-neck fractures are 10% at 30 days and 30% at one year. Therefore, mortality in patients who survive 30 days is 20%. Our data demonstrate that, though initial 30-day mortality was higher in our patient cohort (31.3%), those who survive have a similar mortality between 30 days and one year (25%). Some of our patients who recovered from their acute medical problem that precluded their surgery could undergo surgical intervention later.

Our data on complications demonstrated that outcomes are not as bad as thought previously. A considerable proportion of our patients had no pain or had pain controlled with simple analgesia alone. A proportion of patients could mobilise. These patients had a reasonable outcome. With analgesia, pain settled within a few days and allowed mobilisation, which explained the low prevalence of venous thromboembolism and pneumonia.

Conclusions

In patients with femoral-neck fractures deemed unfit for surgical intervention, reasonable outcomes can be achieved with good medical and nursing care. These outcomes are not as good as those obtained for those who undergo

surgery, but they are not as bad as thought previously. Further studies with prospectively collected and detailed follow-up data are needed to further establish outcomes in these patients.

Acknowledgement

To Jane Evans, who maintains our hip fracture database in the trust.

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