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Research Article

Non-Operative Management of Neck of Femur Fractures: A Retrospective Service Evaluation at Wythenshawe Hospital

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Abstract:

Background:

The optimal management of neck of femur (NOF) fractures remains a clinical challenge, with surgical intervention being the preferred approach. However, a subset of patients may be managed non-operatively due to comorbidities or patient preferences. This study aims to evaluate the outcomes of non-operative management for NOF fractures at Wythenshawe Hospital.

Methods:

A 4-year retrospective review (2021-2024) of all non-operatively managed NOF fractures at Wythenshawe Hospital was conducted. Electronic medical records were utilized to collect data on demographics, fracture characteristics, reasons for non-operative management, treatment modalities, and outcomes (mortality, mobility status).

Results:

Of 1868 NOF fractures, 26 (1.4%) were managed non-operatively. The primary reasons were patient refusal of surgery (26.9%), medical comorbidities (46.1%), and end-of-life care (19.2%). The 30-day mortality rate was 46.2%, with higher rates observed in patients with medical comorbidities (58.3%) and those approaching end-of-life (80%). The 1-year mortality rate was 65.4%. Physiotherapy was associated with lower mortality compared to no physiotherapy (55.6% vs. 85.7%).

Conclusion:

Non-operative management was selectively employed at Wythenshawe Hospital for a small subset of NOF fracture patients with significant comorbidities or limited life expectancy. While mortality rates were higher than surgical management, they compared favourably to other centres, suggesting better outcomes.

Introduction

Neck of Femur (NOF) fractures are one of the most prevalent geriatric presentations in the United Kingdom (UK) with over 76,000 cases , costing the NHS £2 billion per annum (1)(2). Over the years, medicine has led to the advancement and transformation of the healthcare system, increasing the overall life expectancy of the geriatric cohort. Studies worldwide have projected a 2-fold increase in the population size of individuals above the age of 65 by 2050, subsequently increasing the probable incidence rate of NOF fractures and their financial burden.(3) Previous studies have elucidated that cohorts within the geriatric demographic harbour a spectrum of risk factors, encompassing variables such as body mass index (BMI), prevalent comorbidities—particularly chronic cardiovascular and respiratory diseases—osteoporosis, and pharmacological agents like anticoagulants and corticosteroids. These factors compromise the structural integrity of the femoral neck and can exacerbate associated sequelae, further influencing clinical management and subsequent patient rehabilitation.(4) The anatomical composition of the neck of femur and its complex vasculature , serves as a critical determinant in guiding the treatment of intracapsular fractures. Disruption of the vasculature within the femoral neck can precipitate avascular necrosis (AVN), a complication associated with significantly elevated mortality rates, particularly evident in cases of intracapsular fractures, especially when compounded by the presence of aforementioned risk factors.(5)

In order to mitigate the mortality rates following AVN, the National institute for Health and Care Excellence (NICE) has issued guidelines to ensure prompt identification and treatment of co-morbidities, aiming to prevent delays in surgery and ensure that surgical management of NOF fractures occurs within 48 hours.(6) Despite the preference for surgical intervention, the extensive array of comorbidities and frailty in certain patients can render them unfit for such procedures, particularly when considering the added risks of general anaesthesia and the intricacy of the surgery. Consequently, non-operative management becomes imperative in instances where the potential hazards outweigh the benefits, especially when optimum outcomes are desired. This service evaluation aims to investigate the efficacy of non-operative management for neck of femur fractures at Wythenshawe Hospital, assessing their suitability as a viable option with respect to patient demographics. To analyse the outcomes of patients with NOF fractures managed non-operatively, data on NOF fractures over the last four years will be compared to data from other major centres.

Materials & Methods

Aims

This service evaluation aims to assess the current treatment modalities used in the conservative management of neck of femur (NOF) fractures at Wythenshawe Hospital. Through this evaluation, we will examine whether the selection criteria for conservative management differ between Wythenshawe Hospital and other major centres. The evaluation will also identify the factors that influence the choice of management approach, which will help determine the efficacy of the treatment modalities. Additionally, we will analyse and discuss the overall 4-year trend in outcomes related to the conservative management of NOF fractures at Wythenshawe Hospital. Upon completion of this evaluation, recommendations will be made regarding the potential need for a change in practice at Wythenshawe Hospital concerning the management of NOF fractures.

Methods

This retrospective service evaluation investigated the outcomes of conservative management for neck of femur fractures at Wythenshawe Hospital over a four-year period beginning January 2021. We initially obtained an Excel proforma containing data on 1,868 cases, including both surgically (n=1,816) and conservatively (n=52) managed patients. Our inclusion criteria focused on neck of femur fractures classified as intracapsular (subcapital, midcervical, basicervical) or extracapsular (intertrochanteric, subtrochanteric). We excluded 26 hip fractures outside this classification, such as periprosthetic and femoral shaft fractures, resulting in a final cohort of 26 conservatively managed neck of femur cases.

Patient data was collected from the electronic patient record (EPR) systems at Wythenshawe Hospital, specifically HIVE and ARCHIVE, using NHS numbers as unique identifiers. The extracted data encompassed 16 categories, including demographic information (age, BMI), clinical parameters (smoking history, medical history, Rockwood Frailty Score), fracture details (type and cause), management specifics (reason for non-operative management, analgesia regimen), and outcome measures (length of hospital stay, discharge location, mortality).

We compiled the data in an Excel spreadsheet and calculated 30-day and 1-year mortality rates. The Charlson Comorbidity Index (CCI) was computed using an online calculator (https://www.mdcalc.com/calc/3917/charlson-comorbidity-index-cci). We conducted descriptive statistical analyses and examined correlations between the collected variables and patient outcomes using Excel. Our statistical analysis utilized Excel's built-in formulas and functions, including AVERAGE (), MEDIAN (), MODE(), and STDEV(), to calculate measures of central tendency (mean, median, mode) and dispersion (standard deviation). For more complex analyses, we created custom formulas using Excel's mathematical and statistical operators.

After completing the statistical analysis in Excel, we transferred the results to BioRender, a scientific illustration platform. Using BioRender's tools, we created visual representations of our data, including graphs, charts, and tables.

Results

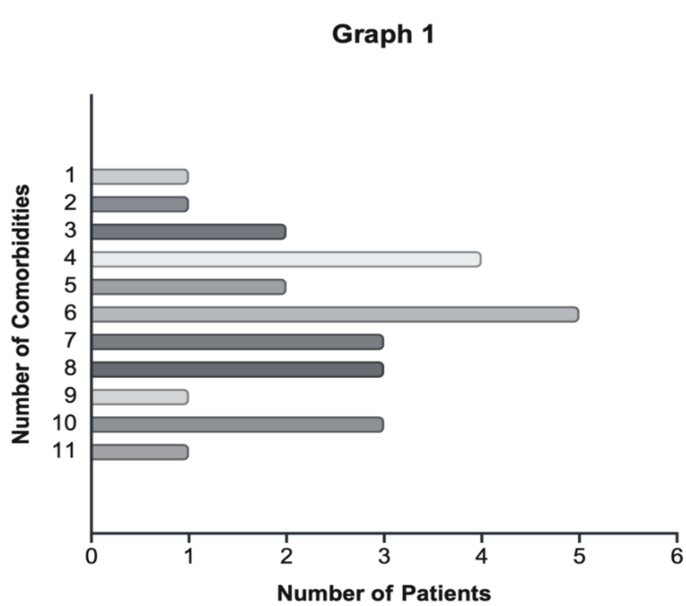

Figure 1: Number of comorbidities per patient for the study cohort

This horizontal bar graph illustrates the number of patients with varying numbers of comorbidities in the study cohort. The x-axis represents the number of patients, ranging from 0 to 6. The y-axis shows the *number of comorbidities, ranging from 1 to 11. Each bar represents the frequency of patients with a specific number of comorbidities. The graph reveals a diverse distribution of comorbidity burden among the study participants, with the highest number of patients having 4 or 6 comorbidities, and fewer patients at the extremes of 1 or 11 comorbidities. (The 11 comorbidities vary between: Oncological, Vascular, Respiratory, Cardiac, Rheumatological, Endocrine, Psychiatric, Opthalmologic, Nephrology, Haematological and Neurological) (The n (1-11) number of comorbidities a patient has can be a combination of any of the comorbidities mentioned previously)*

Selection Criteria

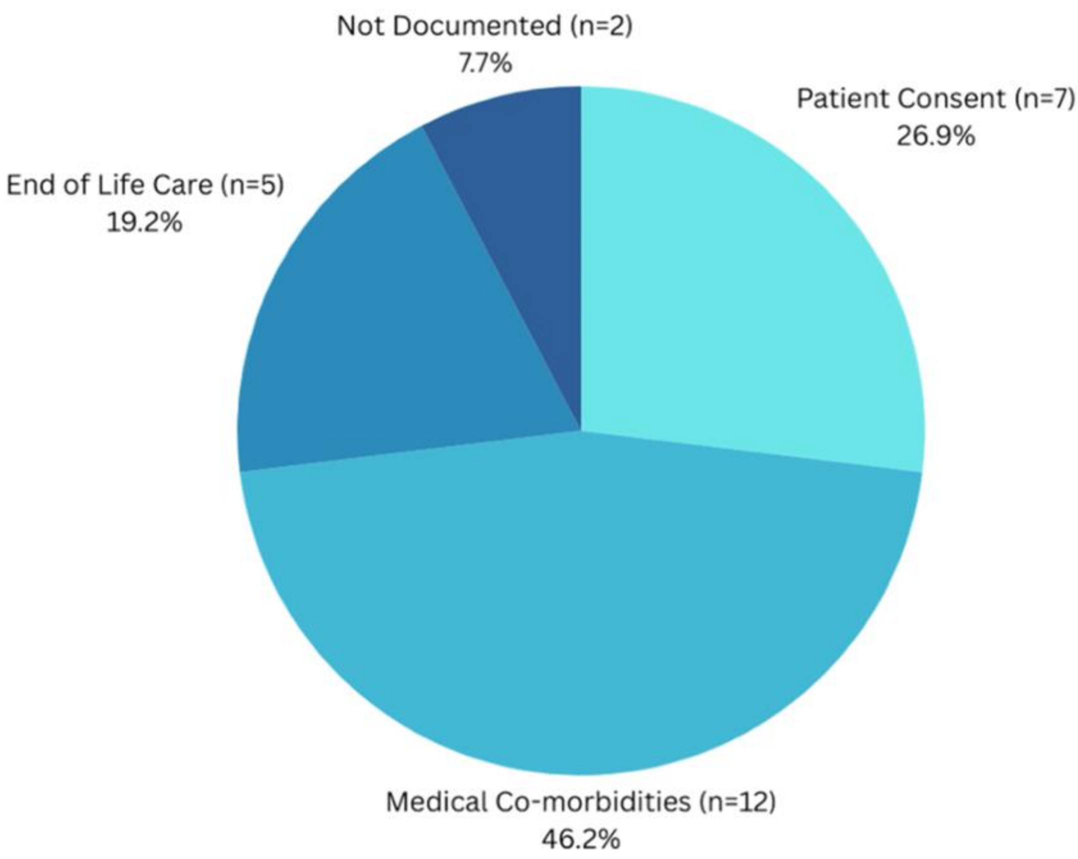

Figure 2: Reasons for patients deemed unsuitable for surgical management

As depicted in Figure 2 (n=26), 26.9% of patients did not consent to having surgery, 46.2% of patients were not suitable for surgery due to complications with their medical co-morbidities. 19.2% of patients *were unsuitable for surgery due to malignancy and a palliative approach was taken. 7.7% of patients had no clear record for their unsuitability for surgery.*

Patient Parameters:

The factors mentioned below enable us to analyse patient demographic as a whole for those managed conservatively. The Charlson Comorbidity Index (CCI) - predicts 10-year survival in patients with multiple comorbidities. The Rockwood Frailty Score - is a tool that predicts the degree of frailty 1(very fit) to 9 (terminally ill) (Table 1).

Parameter	Cohort	Male	Female	SD
Number of patients	26	9	17	N/A
Mean age (years)	81.3	84.2	79.8	9.0
Mean BMI (kg/m^2)	25.5	20.2	24.5	6.0
Mean CCI	8	8.3	7.8	2.8
Mean ASA Grade	4	4	3.5	0.5
Smokers (n=26)	13	6	7	N/A
Mean RFS	6.4	7	5.7	1.6
History of Malignancy (n=26)	11	7	4	N/A
Anticoagulation Use (n=26)	13	4	9	N/A

Table 1: Summary of Patient Parameters

BMI-Body Mass Index (numbers in the Cohort total indicate Average BMI for the cohort)

ASA-American Society of Anaesthesiologist's Grade (numbers in the Cohort total indicate Average ASA for the cohort)

CCI - Charlson Co-Morbidity Index (numbers in the Cohort total indicate Average CCI for the cohort)

RFS - Rockwood Fraility Score

SD - Standard Deviation

Mobility status

Mobility Level	Pre Injury (n=26)	Representation of the cohort (%)	Last Documented (n=26)	Representation of the cohort (%)
Independent	3	11.54	0	0
Mobilises with one aid	6	23.08	1	3.85
Mobilises with Zimmer Frame	8	30.77	6	23.08
Wheelchair user	2	7.69	1	3.85
Immobile	5	19.23	16	61.53
Unknown	2	7.69	2	7.69

Table 2: Mobility levels before fracture and most recent documented mobility post fracture

Of the 26 Patients recorded, 19 patients (73.08%) were mobile prior to the neck of femur fracture, with 5 patients (19.23%) being immobile. However, post conservative treatment 16 patients (61.53%) were identified to be immobile, with only 8 patients (30.78%) using a form of mobility (Table 2).

Mechanism of Fracture

NOF Cause	Number of patients (n=26)	Percentage of cohort (%)
Fall	22	84.62
Pathological	2	7.69
Spontaneous	2	7.69

Table 1: Cause of Neck of Femur (NOF) Fractures in those managed conservatively.

As elicited in Table 3, (n=26), 22 patients (84.62%) had a fall causing them to present with a fracture. 2 patients (7.69%) had a history of malignancy and presented with a subsequent pathological fracture. The remaining 2 patients (7.69%) felt pain on movement with no mechanism of injury indicating a spontaneous fracture.

Mortality

	30 Day Mortality (%)	1 Year Mortality (%)
Conservative Management (n=26)	46.15	65.38
Surgical Management (n=1816)	5.81	-

Table 2: Mortality rates over 2021-2024, highlighting the difference between Conservative and Surgical management (Mx = Management)

The 30-day mortality rates were significantly higher in the conservatively managed group than the surgically managed group, 46.15% and 5.81% respectively. (Data was not analysed to calculate the 1-year mortality in surgically managed patients) (Table 4)

Mortality Rates stratified on basis for non-operative management

Reason for Non Operative Management	Total patients (n=26)	Cohort proportion (%)	30 Day mortality of cohort (%)	1 Year mortality of cohort (%)
Patient Consent	7	26.93	0	14.29
Medical Co-Morbidities	12	46.15	58.33	83.33
End Of Life Care	5	19.23	80	80
Unclear	2	7.69	50	100

Table 3: 30-day and 1-year mortality rates for patients managed non-operatively for neck of femur fractures, stratified by reason for non-operative management.

Among the 26 patients managed non-operatively, 7 patients (26.93%) declined surgery but had a relatively low 1-year mortality rate of 14.29%, with no deaths occurring within 30 days. In contrast, 12 patients (46.15%) with complex medical comorbidities had a considerably higher 30-day mortality rate of 58.33% and an even higher 1-year mortality rate of 83.33%. The subgroup of 5 patients (19.23%) approaching *end-of-life care had an 80% mortality rate within both the 30-day and 1- year periods. For 2 patients (7.69%), the reason for non-operative management was not documented (Table 5).*

Mortality rates stratified based on fracture type:

Type of Hip Fracture	Total patients (n=26)	Cohort proportion (%)	30 Day mortality of cohort (%)	1 Year mortality of cohort (%)
Intracapsular	17	65.38	29.41	58.82
Extracapsular	9	34.62	66.67	77.78

Table 4: 30-day and 1-year mortality rates for patients managed non-operatively, stratified by type of hip fracture.

Among the 26 patients managed non-operatively, 17 patients (65.38%) had an intracapsular hip fracture and exhibited a 30-day mortality rate of 29.41% and a 1-year mortality rate of 58.82%. In the subgroup of 9 patients (34.62%) with extracapsular fractures, the 30-day mortality rate was 66.67%, and the 1-year mortality rate was 77.78% (Table 6).

Mortality rates stratified based on ASA Grade:

ASA Grade (3-4)	Total patients (n=26)	Cohort proportion (%)	30 Day mortality of cohort (%)	1 Year mortality of cohort (%)
3	8	30.77	25	25
4	18	69.23	55.56	77.78

Table 5: 30-day and 1-year mortality rates for patients managed non- operatively for neck of femur fractures, stratified by ASA physical status classification.

ASA-American Society of Anaesthesiologist's

Among the 26 patients managed non-operatively, 8 patients (30.77%) with an ASA grade 3 exhibited a 30-day mortality rate of 25% and a 1-year mortality rate of 25%. In contrast, the subgroup of 18 patients

(69.23%) with an ASA grade 4 had significantly higher mortality rates, with a 30-day mortality rate of 55.56% and a 1-year mortality rate of 77.78% (Table 7).

Mortality rates stratified based on specific non operative treatment modalities:

Conservative Management	Number of patients who did not receive treatment	30-Day Mortality Rate of Untreated Population (%)	One-Year Mortality Rate of Population Who Did Not Receive Treatment (%)	Number of patients who did not receive treatment:	30-Day Mortality Rate of Population Who Received Treatment (%)	1 Year Mortality Rate of Population Who Received Treatment (%)
Nerve Block	10/25	30	50	15/25	60	66.67
Physiotherapy	7/25	85.71	85.71	18/25	33.33	55.56
Analgesia	0/25	0	0	25/25	46.15	65.38

Table 6: 30-day and 1-year mortality rates for patients managed non-operatively, stratified by receipt of specific treatment modalities: nerve block, physiotherapy, and analgesia.

Among the 26 patients managed non-operatively, Only 25 patients had clear documentation with regards to treatment. The 10 patients who did not receive a nerve block had a 30-day mortality rate of 30% and a 1-year mortality rate of 50%. In comparison, the 15 patients who received a nerve block exhibited higher mortality rates, with a 30-day mortality rate of 60% and a 1-year mortality rate of 66.67%. Regarding physiotherapy, the subgroup of 7 patients who did not undergo physiotherapy had substantially higher mortality rates, with an 85.71% mortality rate at both 30 days and 1 year. In contrast, the 18 patients who received physiotherapy had lower mortality rates, with a 30-day mortality rate of 33.33% and a 1-year mortality rate of 55.56%. All patients received analgesia, and their mortality rates were consistent with the overall cohort (Table 8).

Age distribution of deaths within the overall cohort:

The lower quartile age for this group was 75.5 years, while the upper quartile age was 89.5 years. The median age of the deceased patients was 86 years. Additionally, the mean age of this subgroup was 83.4 years (Figure 3).

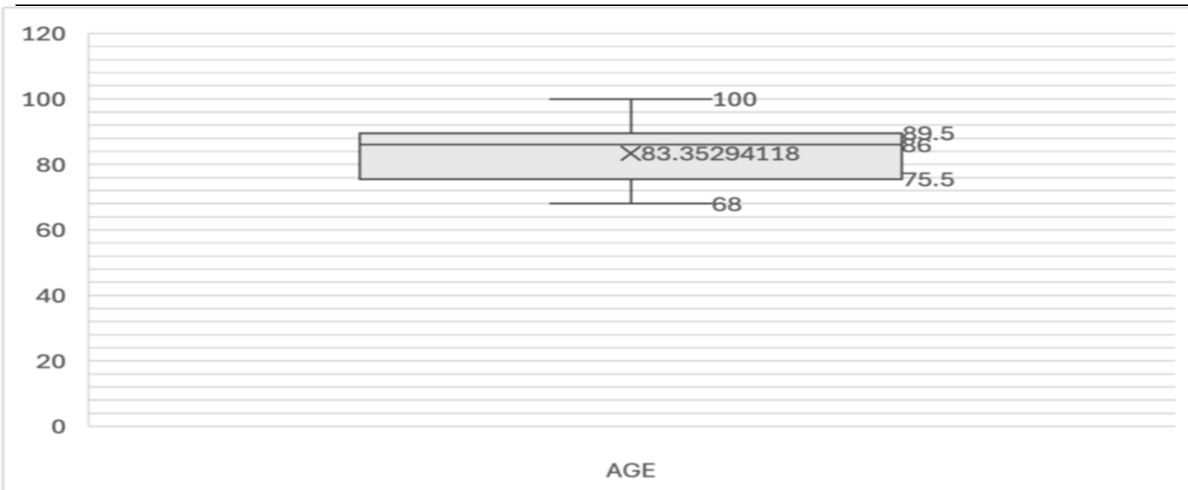

Figure 3: Box plot displaying the distribution of ages for the 17 patients who died among the overall cohort (x marks the mean)

X axis measures the minimum, first quartile, median, third quartile, and maximum value

BMI distribution of deaths within the overall cohort:

The lower quartile BMI for this subgroup was 20.7 kg/m^2, indicating that 25% of the deceased patients had a BMI of 20.7 kg/m^2 or lower. The upper quartile BMI was 30.8 kg/m^2, meaning that 75% of the deceased patients had a BMI of 30.8 kg/m^2 or lower. The median BMI of the deceased patients was 25.41 kg/m^2, while the mean BMI for this subgroup was 25.5 kg/m^2 (Figure 4).

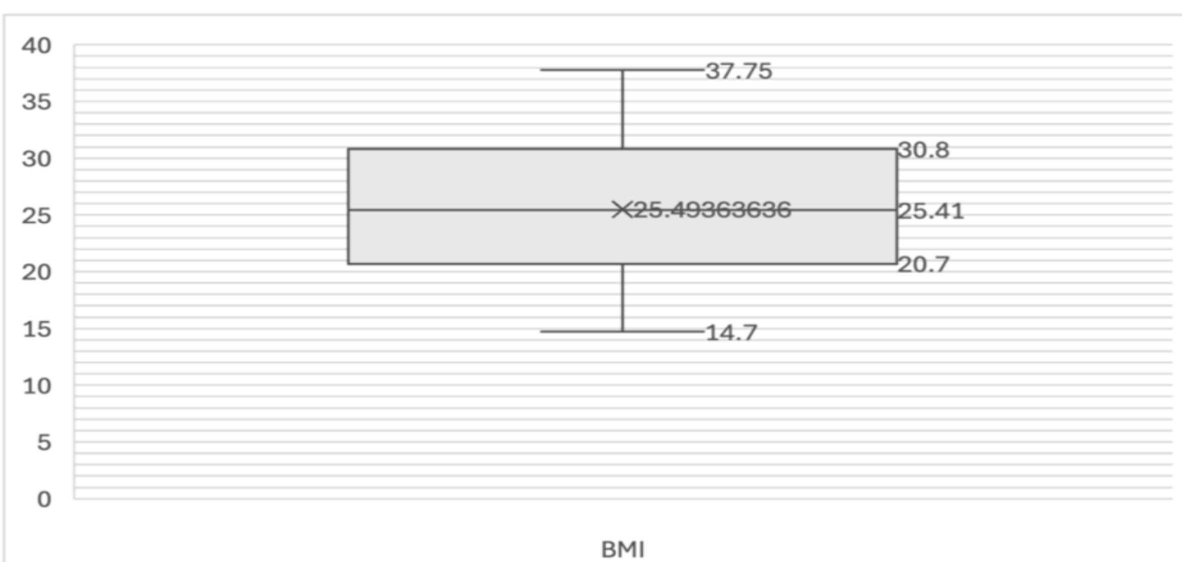

Figure 4: Box plot depicting the distribution of body mass index (BMI) values of 17 patients who died among the overall cohort

X axis measures the minimum, first quartile, median, third quartile, and maximum value

Rockwood Frailty Scored distribution of deaths within the overall cohort:

The lower quartile was 5, while the upper quartile was 8. The median score of the deceased patients 6. Additionally, the mean score was 6.4 (Figure 5).

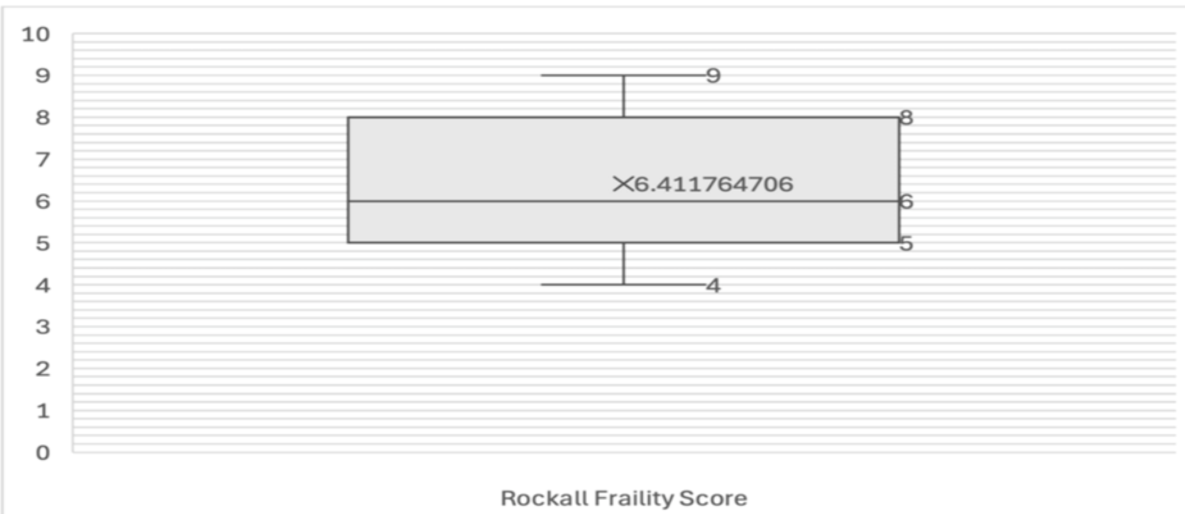

Figure 5:Box plot showing the distribution of the Rockwood Frailty Score (RFS) for the 17 patients who died among the overall study cohort.

X axis measures the minimum, first quartile, median, third quartile, and maximum value

Length of stay distribution of deaths within the overall cohort:

The lower quartile for length of stay was 1 day, while the upper quartile was 11 days. The median length of stay for the deceased patients was 6 days. Additionally, the mean length of stay was 7.6 days. A length of stay of 27 days was identified as an outlier (Figure 6).

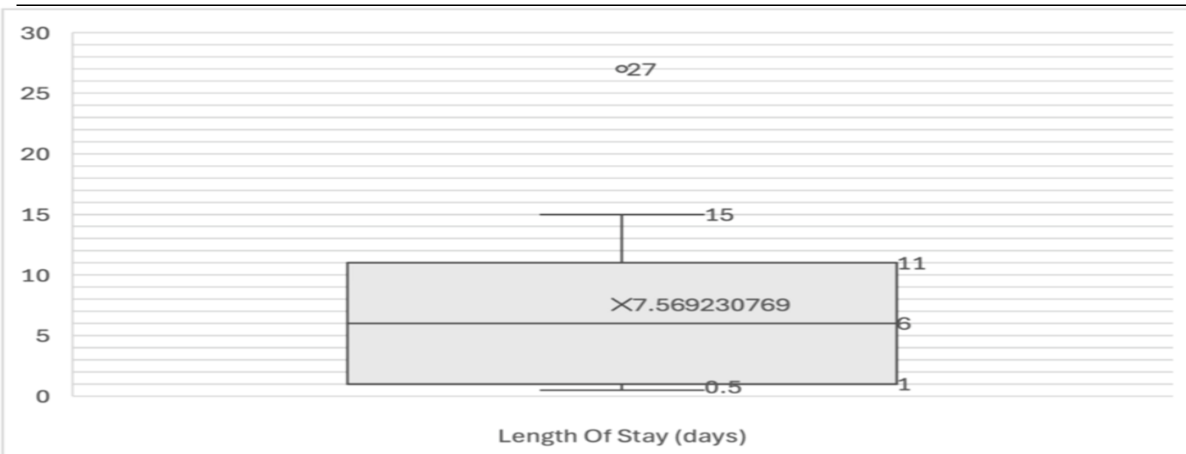

Figure 6: Box plot displaying the distribution of length of stay (LOS) in days for the 17 patients who died among the overall study cohort.

X axis measures the minimum, first quartile, median, third quartile, and maximum value

Charlson Comorbidity Index distribution of deaths within the overall cohort:

The lower quartile for the CCI scores was 6, while the upper quartile was 10. The median CCI score of the deceased patients was 8. Additionally, the mean CCI score was 8.2 (Figure 7).

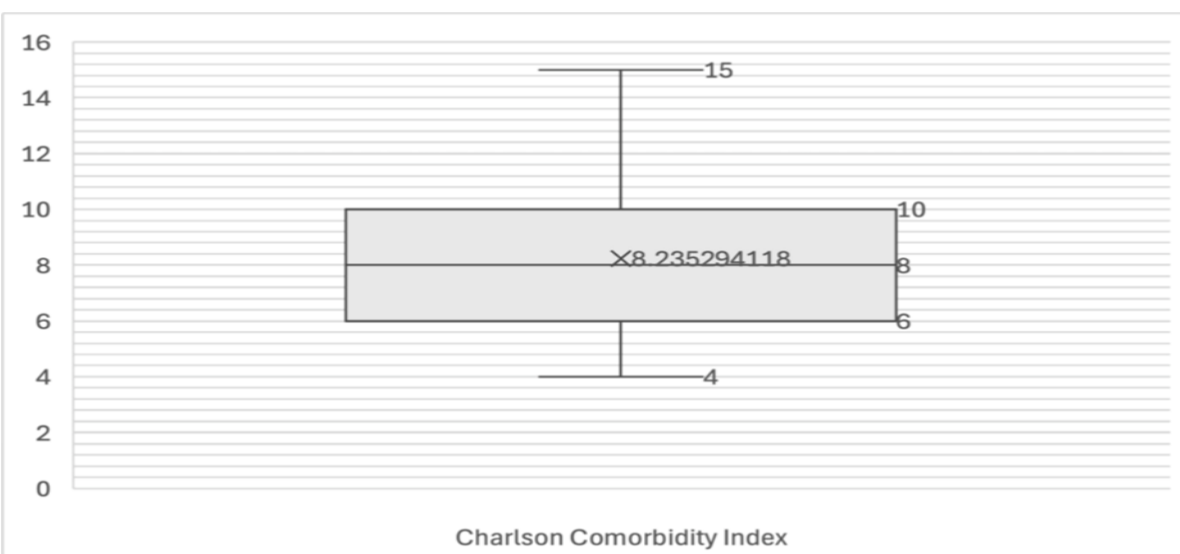

Figure 7: Box plot displaying the distribution of the Charlson Comorbidity Index (CCI) scores for the 17 patients who died among the overall study cohort.

X axis measures the minimum, first quartile, median, third quartile, and maximum value

Discussion

NOF fractures are breaks that occur at the femoral neck, which is the connection between the femoral shaft and the femoral head. (7) Since as early as 1961, studies have highlighted the importance of the Garden classification system in providing crucial prognostic information about the outcomes of surgical interventions for these fractures, significantly influencing surgical decision-making processes. This classification system categorizes NOF fractures into four types based on the degree of bone alignment and displacement: Garden types 1 and 2 are non-displaced fractures, while Garden types 3 and 4 are displaced fractures.(8)

The assessment of alignment and displacement is particularly critical when dealing with NOF fractures due to the complex anatomical structure of the femoral neck.(7) The femoral head primarily receives its blood supply from the medial femoral circumflex artery, making it highly susceptible to vascular injury upon fracture displacement. The deeper branches of this artery are especially vulnerable to rupture. This compromise in blood perfusion to the femoral head can predispose patients with Garden types 3 and 4 fractures to avascular necrosis (AVN), a form of osteonecrosis, which is a serious complication that needs to be prevented both during and after the fracture.(9)

The National Institute for Health and Care Excellence (NICE) guidelines recommend surgical treatment as the primary intervention for neck of femur (NOF) fractures.(10) Substantial evidence has demonstrated that surgical intervention within 48 hours yields superior outcomes compared to non-operative management, including lower mortality rates, reduced hospital stay durations, and improved rehabilitation outcomes. However, in a select subset of cases, non-operative management may be the preferred approach, particularly when the potential risks associated with surgical intervention outweigh the anticipated benefits.(11)

Such instances where non-operative management may be favoured include patients with minimally displaced fractures, where early mobilization without surgical fixation is deemed more advantageous or in cases where the cumulative effect of frailty, multiple comorbidities, and unfavourable demographic factors collectively contraindicate surgical intervention due to an elevated risk profile.(12) In order to help group these types of patient demographic and risk factors, studies have utilized different classification systems to assist surgeons in achieving selective criteria. The main ones highlighted by Gregory et al. , Ek et al. and Moulton et al. are the American Society of Anaesthesiologists (ASA) grade, which ranges from grade 1 to 5, measuring a patient's pre-anaesthesia medical comorbidities and its preoperative risks.(13)(14) The Nottingham Hip Fracture Score (NHFS), a summative score of seven preoperative variables that provide an estimated risk of 30-day postoperative mortality. The Charlson Comorbidity Index (CCI), which predicts 10-year survival in patients with multiple comorbidities.(15)(16)(17)

When focussing specifically on conservative management, despite abundant literature, there is no consensus regarding the optimal conservative treatment. Literature states that the treatment protocol involves prolonged non-weight-bearing and bed rest, with mobilization introduced gradually as pain levels permit.(18)

However, this conservative approach carries its own set of potential complications associated with immobilization, such as the development of pressure ulcers, hypostatic pneumonia, deep vein thrombosis (DVT), pulmonary embolism, urinary tract infections, bowel dysfunction, and joint stiffness. Intensive nursing care and medical monitoring are crucial during the initial phase to ensure respiratory function and prevent complications like bedsores and DVT.(18)(19) Techniques like fascia iliac blocks (FIBs) and femoral nerve blocks (FNBs) have been shown by studies, such as Maniar et al., to provide superior pain relief compared to systemic analgesia alone, especially for pain experienced during movement.(20)(21)

Several studies have demonstrated the benefits of regional analgesia in this setting. Eight trials by Guay et al., involving 373 participants, found that peripheral nerve blocks significantly reduced pain on movement within 30 minutes of block placement, with a standardized mean difference (SMD) of -1.41 (95% confidence interval (CI) -2.14 to -0.67).(22) Another randomized clinical trial by Fadhlillah et al., with 645 patients, further reinforced these findings, showing that pain during movements was significantly reduced (SMD=-1.82, 95% CI -2.26 to -1.38), although no significant difference was observed for pain at rest.(23) These studies highlight the importance of nerve blocks, especially during the mobilization stage.

Early mobilization has gained increasing attention in national hip fracture databases, as a patient's mobility status after a fracture can significantly influence their quality of life and rehabilitation outcomes. Physiotherapy is emerging as a crucial conservative measure in this regard.(24) A study conducted by Smith et al. highlighted that the odds of developing complications were 1.9 times higher if a patient remained bedridden compared to those who mobilized after physiotherapy.(25) Complementing this finding, Hankins et al. identified that 76.3% of patients who received physiotherapy on the first postoperative day had significantly lower mortality rates compared to those who received physiotherapy on the second postoperative day or later (3.7% vs. 9.8%, respectively).(26) The discernible link between physiotherapy, timing of treatment initiation, and post-fracture mobility status was also corroborated by the study conducted by Shuman et al. Their findings indicated that individuals who underwent physiotherapy demonstrated an 11% reduction in fall risk for every 0.05m/s increase in gait speed and mobility.(27) Collectively, these findings suggest that conservative management, when implemented correctly and in a timely manner, can yield positive outcomes in terms of reducing the overall risk of recurrence and mortality.

Other centres have also been investigated to observe changes in trends and analyse the overall outcomes of conservative management, focusing specifically on NOF fractures.

In a prospective multicenter cohort study spanning 25 hospitals in the Netherlands, Loggers et al. investigated the outcomes of non-operative versus operative management for proximal femoral fractures over a 6-month follow-up period from September 1, 2018, to April 25, 2020. Among the 172 enrolled patients, 88 opted for non-operative management, while the remaining 84 underwent operative management. The study found that the non-operative management group experienced fewer adverse events compared to the operative group (67 vs. 167). Notably, the 30-day mortality rate was substantially higher in the non-operative cohort, at 83%, compared to 25% in the operative group.(28)

A 6-year retrospective review conducted by Pradhan et al. (2019) at John Radcliffe Hospital, Oxford, examined the outcomes of non-operative management for neck of femur (NOF) fractures from August 2013 to August 2019. The study found that 3.2% (99/3132) of NOF fractures were managed non-operatively, with the two most common reasons being 'comfortable mobilization' or 'patient frailty/medically unwell'. Notably, 74% of patients for whom operative risk was deemed to outweigh the potential benefits died within 30 days of admission, and the 1-year mortality rate for this group was 92%. However, in the 'comfortable mobilization' subgroup, the 30-day mortality rate was considerably lower at 6.8%, with a 1-year mortality rate of 25%.(11)

The authors highlighted that the poor outcomes reported for non-operative management were askew by the inclusion of patients with multiple medical comorbidities and high anaesthetic risk. Nonetheless, they suggested that non-operative management should still be considered for cohorts with minimally displaced, stable fractures. This study reinforces the findings of Loggers et al., underscoring the potential viability of non-operative management for select patient populations with NOF fractures.

Outcomes at Wythenshawe Hospital:

The analysis of the overall results shows that out of the 1868 patients who presented with a hip fracture over the years 2021-2024 at Wythenshawe Hospital, the 30-day mortality rates were significantly higher in the conservatively managed group compared to the surgically managed group, at 46.15% and 5.81%, respectively, indicating that surgical management was associated with significantly better outcomes and lower short-term mortality. The increase in mortality observed in the conservatively managed group is expected as patients selected for conservative management tend to have more severe underlying health conditions and higher surgical risk, predisposing them to poorer outcomes and higher mortality.

When examining the selection criteria for non-operative management, the key findings were as follows: Among the 26 patients managed non-operatively, 26.93% declined surgery and had a relatively low 1-year mortality rate of 14.29% with no deaths within 30 days. In contrast, 46.15% with complex medical comorbidities had a significantly higher 30-day mortality rate of 58.33% and a 1-year mortality rate of 83.33%. The subgroup of 19.23% approaching end-of-life care had an 80% mortality rate within both 30-day and 1-year periods. These subgroup classifications and associated percentages were similar to those reported by Gregory et al.(15)

Ek et al. and Moulton et al. also found that non-operatively managed patients had an average (ASA) grade of 4, consistent with findings at Wythenshawe Hospital. However, the mean Charlson Comorbidity Index (CCI) reported by Ek et al. and Lim et al. were 3 and 6, respectively, lower than the mean CCI of 8 observed at Wythenshawe.(16)(14)

This judicious selection criteria, reflected in the higher mean CCI, may explain the elevated mortality rates observed in the conservatively managed cohort, as only the highest-risk patients were included in this group. Indicating that Wythenshawe Hospital was more efficient in reserving conservative management only when absolutely necessary based on the patient's overall health status and prognosis.(16)(17)

When looking at the basis of conservative management itself, the use of nerve blocks for acute pain management was examined. Among the 26 patients managed non-operatively, 10 patients who did not receive a nerve block had a 30-day mortality rate of 30% and a 1-year mortality rate of 50%. In comparison, the 15 patients who received a nerve block exhibited higher mortality rates, with a 30-day mortality rate of 60% and a 1-year mortality rate of 66.67%. Although studies by Guay et al. have shown that peripheral nerve blocks are significant in improving mobility post-fracture, this study's findings as well as mine suggest that nerve blocks may have no influence on overall mortality in conservatively managed patients.(22)

Regarding physiotherapy, the findings are consistent with those reported by Hankins et al., who identified that 76.3% of patients who received physiotherapy on the first postoperative day had significantly lower mortality rates compared to those who received physiotherapy on the second postoperative day or not at all (3.7% vs. 9.8%, respectively).(26) Similarly, in my study, the 7 patients who did not undergo physiotherapy had substantially higher mortality rates, with an 85.71% mortality rate, in comparison to the 18 patients who did receive physiotherapy, with a 55.6% mortality rate. However, with only 3.8% of the cohort improving in mobility status and 61.53% remaining immobile post-treatment, physiotherapy alone may not have been helpful as the sole aspect of treatment when mobilizing the patient. Nevertheless, the results indicate that ensuring all patients receive physiotherapy may lead to lower mortality rates in the conservatively managed population.

My findings also highlight the complexity of the patient population at Wythenshawe who experienced mortality events. The upper quartile age of 89.5 years, coupled with a median BMI of 25.4 (overweight range), a median RFS of 6 (moderate frailty), and a median CCI of 8 (high comorbidity burden), collectively underscore the vulnerability of this cohort. Additionally, the average length of stay of 7.6 days suggests a protracted clinical course. Notably, higher mortality rates of 77.78% were observed in patients managed conservatively for extracapsular fractures, emphasizing the need for careful patient selection and risk stratification in this subgroup.

In comparison to other centres, our institution demonstrated lower overall 1-year mortality rates of 65.38% in the conservative management cohort, contrasting favourably with the rates of 83% and 92% reported by Loggers et al. and Pradhan et al., respectively.(11,28)

Limitations

The study was limited by inconsistencies in data collection for the measured variables across the years 2021 to 2024, leading to gaps in the data and fluctuations in the overall cohort size, which can introduce bias into the results. Additionally, the study lacked sufficient follow-up time to comprehensively analyse the outcomes of surgical management, precluding thorough comparisons between the surgical and conservative cohorts. Furthermore, the study did not incorporate standardized assessments of mobility status at defined time intervals, nor did it ensure complete follow-ups for all patients, thereby preventing a direct evaluation of the impact of mobility on mortality outcomes. These limitations underscore the need for rigorous data collection protocols, extended follow-up periods, and comprehensive assessment of relevant clinical parameters at Wythenshawe to enhance the validity and generalizability of the findings.

Conclusion

This service evaluation focuses on the appropriate use of conservative management for patients with neck of femur fractures at Wythenshawe Hospital, who were deemed unsuitable for surgical intervention due to severe comorbidities or limited life expectancy. The lower overall 1-year mortality rate compared to other major centres suggests Wythenshawe was more efficient in-patient selection criteria. However, the study was limited by a lack of data on the hospitals' EPR system hindering effective analysis. Moving forward, implementing rigorous data collection protocols, extended follow-up periods, and routine mobility evaluations would enhance the validity and generalizability of findings. Additionally, ensuring consistent use of adjunctive therapies, such as nerve blocks and early physiotherapy, may further optimize outcomes in this high-risk patient population. A multidisciplinary approach will be crucial in addressing limitations and driving sustainable changes to enhance the outcomes for patients undergoing conservative management.

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