การศึกษาเปรียบเทียบอัตราการเกิดภาวะแทรกซ้อนและเสียชีวิตในผู้ป่วยกระดูกสะโพกหักจากภาวะกระดูกพรุนที่ได้รับการผ่าตัดยึดตรึงกระดูกภายในระยะเวลา 48 ชั่วโมงกับหลัง 48 ชั่วโมง ในโรงพยาบาลสรรพสิทธิประสงค์

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บทคัดย่อ

หลักการและเหตุผล: ภาวะ Closed osteoporotic intertrochanteric fracture สัมพันธ์กับผลลัพธ์การเจ็บป่วยและการเสียชีวิตที่สูง และข้อมูลเพิ่มขึ้นชี้ให้เห็นว่า การผ่าตัดภายในระยะเวลาที่รวดเร็วสามารถทำให้ผลลัพธ์ดังกล่าวดีขึ้น อย่างไรก็ตามข้อมูลดังกล่าวในผู้ป่วยในประเทศกำลังพัฒนามาน้อยมาก ดังนั้นงานวิจัยนี้จึงต้องการศึกษาอัตราการเสียชีวิตและการเกิดภาวะแทรกซ้อนหลังการรักษาด้วยการผ่าตัด และความสัมพันธ์กับระยะเวลาการผ่าตัดในผู้ป่วยที่มีภาวะ Closed osteoporotic intertrochanteric fracture ในโรงพยาบาลระดับตติยภูมิ

วัสดุและวิธีการ: ในการศึกษาแบบไปข้างหน้านี้ ผู้วิจัยเก็บข้อมูลทางสังคมประชากรและข้อมูลทางคลินิกของผู้ป่วย Closed osteoporotic intertrochanteric fracture ซึ่งได้รับการผ่าตัดรักษาในโรงพยาบาลสรรพสิทธิประสงค์ จำนวน 209 คน และศึกษาอัตราการเสียชีวิตและการเกิดภาวะแทรกซ้อนหลังผ่าตัด โดยวิเคราะห์ค่าระยะเวลาการรอดชีวิตจากระยะเวลาตั้งแต่วันที่ผ่าตัดถึงวันที่เสียชีวิต หรือเท่ากับ 12 เดือนหากยังมีชีวิตอยู่ ทำการสร้างกราฟ Kaplan-Meier curves และคำนวณและเปรียบเทียบอัตราการรอดชีวิตระหว่างกลุ่มโดยใช้สถิติ log rank test และทำการศึกษาความสัมพันธ์ระหว่างระยะเวลาการรอผ่าตัด และปัจจัยอื่น ๆ กับความเสี่ยงการเสียชีวิตและความเสี่ยงการเกิดภาวะแทรกซ้อนโดยใช้สถิติ Cox proportional hazard regression และ logistic regression

ผลการศึกษา: อายุเฉลี่ยของผู้ป่วยเท่ากับ 76.6 (SD=10.9) ปี โดยที่ร้อยละ 65 เป็นเพศหญิง จากผู้ป่วยทั้งหมด 209 คน มี 40 คนที่เสียชีวิต คิดเป็นร้อยละการเสียชีวิตที่ 1 ปี ที่ 19.1% โดยพบว่า ผู้ป่วยที่ได้รับการผ่าตัดภายในระยะเวลา 48 ชั่วโมงมีการเสียชีวิตที่น้อยกว่ากลุ่มที่รับการผ่าตัดหลัง 48 ชั่วโมง (9.4% และ 25.8% ตามลำดับ) ตลอดการติดตามเป็นระยะเวลา 1 ปีหลังผ่าตัด มีผู้ป่วย 61 คน (29.2%) ที่เกิดมีภาวะแทรกซ้อนอย่างน้อย 1 อย่าง ผู้ป่วยที่ได้รับการผ่าตัดหลัง 48 ชั่วโมง มีความเสี่ยงที่จะเสียชีวิตสูงขึ้นถึง 2.3 เท่า และความเสี่ยงที่จะเกิดภาวะแทรกซ้อนสูงขึ้นเกือบ 4 เท่า ของผู้ป่วยที่ได้รับการผ่าตัดภายใน 48 ชั่วโมง (Adjusted hazard Ratio 2.29 (95% CI 1.03-5.10) และ Adjusted odds ratio 3.75 (95% CI 1.83-7.66) ตามลำดับ) ค่าความสัมพันธ์ดังกล่าวไม่เปลี่ยนแปลงหลังการควบคุมอิทธิพลของอายุ เพศ โรคประจำตัว ASA category, Evans classification และ ชนิดของ implants

สรุป: การผ่าตัดรักษาที่ล่าช้าสัมพันธ์กับความเสี่ยงของการเสียชีวิตและเกิดภาวะแทรกซ้อนที่เพิ่มขึ้นของผู้ป่วย closed osteoporotic intertrochanteric fracture ผลการศึกษาดังกล่าวแสดงให้เห็นถึงความสำคัญของโปรแกรมการดูแลแบบเร่งด่วนหรือ Fast track ในการรักษาด้วยการผ่าตัดในผู้ป่วยกลุ่มนี้

คำสำคัญ: ภาวะกระดูกพรุน กระดูกหัก การเสียชีวิต ภาวะแทรกซ้อนหลังผ่าตัด การผ่าตัดรักษา

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Introduction

Like many other countries around the world, Thailand's demographic structure has been shifting towards ageing society. Longer life expectancy results in many consequences. Older people are more likely to be affected by many comorbidities which could lead to fragility, falls and fractures.[1-3] Fragility intertrochanteric fractures are common in elderly leading to a number of serious consequences, e.g. increased risk of pneumonia, urinary tract infection and pressure sore, with mortality in approximately one-fifth of patients.[4-5] Many studies have shown that fixation or arthroplasty can significantly help decrease overall mortality by 9%-51%[6-8] This treatment has consistently been reported to be associated with lower morbidity after hip fractures, both closed femoral neck and intertrochanteric fracture.[7-11] Many previous studies including recent meta-analyses further suggested that early treatment may help reduce overall mortality when compared to delayed surgical treatment, with a one-year mortality of 15-18% and 20-23% in hip fracture patients receiving surgical treatment within 48 hours and after 48 hours respectively.[8-10,12,13]

Previous literature supported beneficial effects of reduced time to fixation in treatment outcomes of hip fractures, both neck and intertrochanteric fractures,[8-10,12,13] but evidence on its benefits in osteoporotic intertrochanteric fractures is still limited. Treatment outcomes and their prognostic factors varied greatly across different populations and ethnicities, environments, healthcare systems, workload and location of fractures.[9,10,14] However, most previous studies were done in Western and developed countries. Only a few studies were done in developing countries,[15] where patient characteristics, healthcare systems and standards of treatment may be different. Further, many studies in developing countries were mostly retrospective, with concerns over data availability and validity.

Therefore, the present study aimed to describe one-year mortality and occurrence of postoperative complications in patients with closed osteoporotic intertrochanteric fracture treated in a tertiary care hospital in Thailand. Additionally, our study also aimed to examine the association of time to fixation and other factors with morbidity and mortality in these patients. This may be used to inform policy and practices in treatment of intertrochanteric fracture in Thailand and other developing countries.

Materials and Methods

Study population

A prospective cohort study was conducted in 209 closed osteoporotic intertrochanteric fracture patients who were treated surgically in Sunpasitthiprasong Hospital between June 1st, 2017 to May 31th, 2018 and followed for a minimum of 12 months. We included patients aged 50 years and older diagnosed with closed osteoporotic intertrochanteric fracture by orthopaedists.

In practice, osteoporotic fracture is clinically diagnosed based on a number of characteristics, mainly patient's age and whether the mechanism of the fracture is low energy trauma/ from simple fall.[16-17] This is complied with one of the widely used criteria in Thailand: Khon Kaen Osteoporosis study Score (KKOS) ≤ -1).[16] All of the patient s received operative internal fixation by orthopaedists with work experience of more than 5 years.

Patients with suggestively pathological fracture due to bone tumor, a history of previous hip surgery or fracture and a history of prolonged use of oral corticosteroid more than 3 months were excluded. Those with congestive heart failure, acute myocardial infarction (AMI), end stage renal disease (ESRD), cerebrovascular disease (CVA), cirrhosis, thalassemia, hyperparathyroidism, Cushing's syndrome, and rheumatoid arthritis and being treated with anticonvulsants or anticoagulants were also excluded.

The sample size was calculated to address a research question "whether time to fixation was associated with mortality." Based on data on morbidity and morality by time-to-fixation reported in previous studies by Forte ML, et al.[4] and Ryan DJ, et al.[18], a sample size of 200 patients was required.

Data collection and outcome ascertainment

After informed consent was given, all patients were admitted and received standard treatments by experienced orthopaedic surgeons. Surgery time, operative techniques and type of implants were solely dependent on each surgeon's practice. Patients with no contraindications received less than 5 pounds skin traction by the Buck's extension technique, adequate pre-postoperative analgesic drugs, appropriate preoperative assessment, preoperative prophylactic intravenous antibiotics with 2 grams of cefazolin followed by 1 gram of cefazolin every 6 hours postoperatively. Radivac drain was placed intraoperatively and later removed postoperatively when the volume of fluid discharge in the bottle was less than 50 cc per day for 2 consecutive days. During the postoperative period, all patients received physical therapy by partial weight bearing using a walker. Data on sociodemographic characteristics, underlying diseases, medications, a history of previous hip fracture, mechanism of injury, Evans classification and Singh classification were collected. By careful medical record reviews, we obtained additional clinical data including time to surgery, type of implant or prosthesis, operative time, complications during surgery, blood loss, duration of hospitalization, and postoperative complications (namely, pneumonia, urinary tract infection (UTI), pressure sore, surgical site infection, deep vein thrombosis (DVT)). To reduce detection biases, outcome assessors were blinded for information on time to surgery, which was the main exposure considered in this study. In this study, 'delayed surgery' was defined as time

to internal fixation of more than 48 hours after admission and 'early surgery' was defined as time to internal fixation of within 48 hours.

The primary outcome was mortality rates in patients with closed osteoporotic intertrochanteric fracture who underwent early and delayed fixation. Patients were followed up at the orthopaedic outpatient department at 2 weeks, 1, 3, 6, 9 and 12 months. In cases the patients did not attend follow-up visits, they were reminded and invited back by phone. Mortality data were obtained up to 12 months postoperatively by reviewing hospital's electronic medical records and confirmed by vital statistics from the Ubonratchathani Municipality Administrative Office. Survival time was defined as a duration from dates of surgery to death, or 12 months if the patients survived at 12 months after operation.

The secondary outcome was postoperative complications which included pneumonia, UTI defined based on the US Centers for Disease Control and Prevention/ National Healthcare Safety Network,[19] surgical site infection,[20] pressure ulcer[11] and DVT[21] occurred during hospitalization and follow-up.

Statistical analyses

Data were analyzed using the SPSS 13th version and STATA 14.2 for Window. Patient characteristics were described using number (%) and mean (standard deviation, SD) for categorical, normally distributed continuous variables respectively. Comparison in these characteristics between dead and survived patients was performed using chi-square test and independent t-test for categorical and continuous variables respectively. Kaplan-Meier curves were plotted and overall survival was computed. The difference in the survival between two or more groups were assessed using the log rank test. Factors associated with mortality were examined using univariate and multivariate Cox proportional hazard regression and hazard ratio (HR) with 95% confidence interval (CI) was presented. Due to data on time to first complication were not available, factors associated with postoperative complication were examined using univariate and multivariate logistic regression and odds ratio (OR) with 95% CI was reported. Factors possibly associated with outcomes in univariate regression were included in multivariate regression. The P-value of <0.05 was considered statistically significant.

Results

Table 1 Sociodemographic and clinical characteristics of patients with closed osteoporotic intertrochanteric fracture participating in this study by mortality status (n=209)

Characteristics	Total (n=209)	Alive (n=169)	Died (n=40)	p-value*
Age, years	76.6 (10.9)	75.2 (10.7)	82.9 (9.5)	0.001
Gender				
male	64 (28.7)	53 (31.4)	11 (27.5)	0.634
female	145 (65.0)	116 (68.6)	29 (72.5)	
Number of comorbidities				
none	49 (23.4)	40 (23.7)	9 (22.5)	0.029
1-2	92 (44.0)	80 (47.3)	12 (30.0)	
>2	68 (32.6)	49 (29.0)	19 (47.5)	
Evans classification				
stable	145 (69.4)	117 (69.2)	28 (70.0)	0.924
unstable	64 (30.6)	52 (30.8)	12 (30.0)	
Osteoporotic drugs				
none	182 (87.1)	148 (87.6)	34 (85.0)	0.223
calcium	10 (4.8)	7 (4.1)	3 (7.5)	
calcium + vitamin D	14 (6.7)	12 (7.1)	2 (5.0)	
antiresorptive drug	3 (1.4)	2 (1.2)	1 (2.5)	
ASA category				
Class 1	1 (0.5)	1 (0.6)	0 (0)	0.115
Class 2	34 (16.3)	30 (17.8)	4 (10.0)	
Class 3	147 (70.3)	120 (71.0)	27 (67.5)	
Class 4	24 (11.5)	17 (10.1)	7 (17.5)	
Class 5	3 (1.4)	1 (0.6)	2 (5.0)	
Class 6	0 (0)	0 (0)	0 (0)	
Timing to operation				
≤ 48 hrs	85 (40.7)	77 (45.6)	8 (20.0)	0.003
> 48 hrs	124 (59.3)	92 (54.4)	32 (80.0)	

Note Data in the table are described as n (%) and mean (standard deviation).

* p-value for comparison between those who died and were alive using chi-square test and independent t-test for category and continuous variables respectively.

Table 1 describes demographic and clinical characteristics of 209 patients with osteoporotic intertrochanteric fracture participating in this study, overall and by death status. An average age of the patients was 76.6 (SD=10.9) years, with 65% being female. Approximately two-thirds of the patients had at least one comorbidity, stable fracture configuration as defined by the Evans classification, Type 3 ASA category. Of all patient 124 (59%) underwent delayed internal fixation, defined time-to-operation of >48 hours. The large majority of patients did not receive the osteoporotic drugs. Compared to those who survived, patients who died during the follow-up of 1 years were older and more likely to have one or more underlying diseases. Both groups were similar regarding sex, physical status defined by the ASA classification, Evans classification, and prior use of osteoporotic medications. Higher percentage of having time to fixation of >48 hours were observed in those who died than those who survived.

Figure 1 Mortality and post-op complications associated with early and delayed internal fixation, defined as the operation undertaken within 48 hours and after 48 hours respectively.

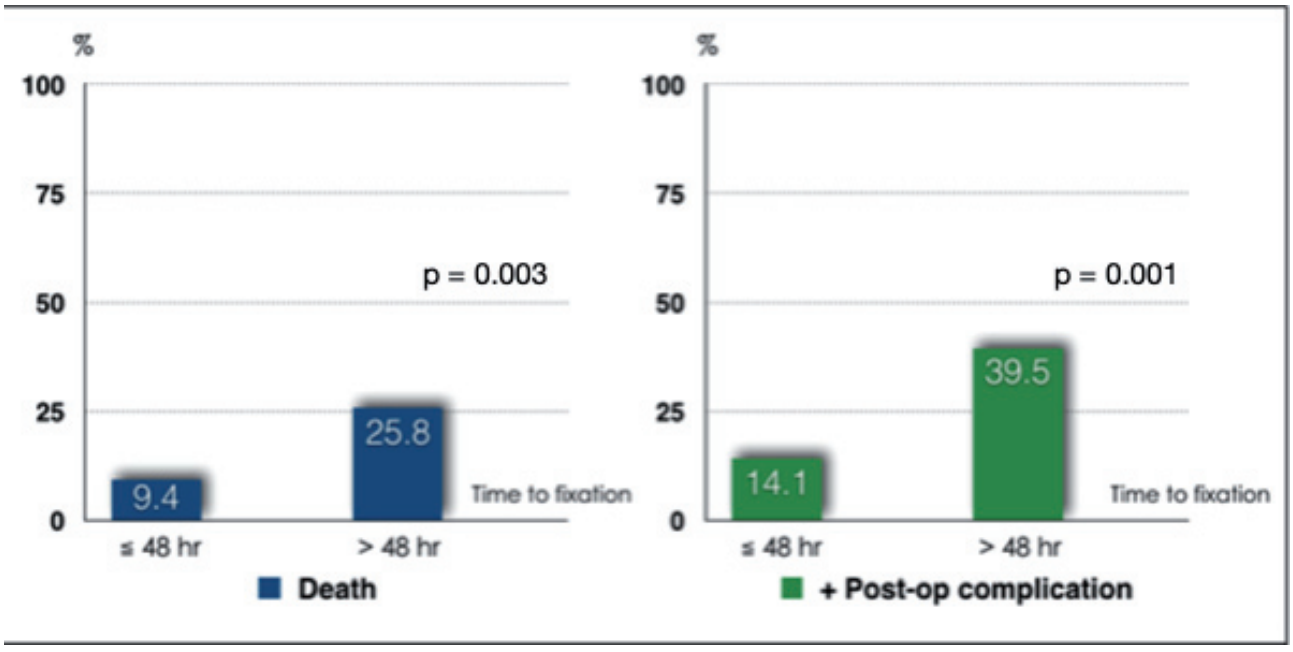

Figure 1 shows percentages of mortality and post-operative complications in patients receiving early and delayed internal fixation. Of 209 patients, 40 patients died over 1 year of follow-up, an overall mortality of 19.1%. Those receiving early surgery were less likely to die than those receiving delayed surgery (9.4% and 25.8% respectively, p=0.003). With a total time-at-risk of 2,201 months, overall mortality rate was 18.2 (95% CI 13.3-24.8) per 1,000 person-months. Those receiving early surgery had significant lower mortality rates than those receiving delayed surgery (8.5 (95% CI 4.2-16.9) and 25.5 (95% CI 18.0-36.1) per 1,000 person-months respectively).

Over 1 year of follow-up, 61 patients (29.2%) developed at least one complication. As shown in Figure 1, lower percentage of complications was observed in those who receive early than delayed internal fixation (14.1% and 39.5% respectively, p=0.001). Of all patients, 43 (20.6%) had post-operative urinary tract infection, while 26 (12.4%), 11 (5.3%) and 5 (2.4%) developed pneumonia, pressure sore and deep vein thrombosis respectively. Noteworthy, 19 patients (9.1%) had more than one complication.

Figure 2 Kaplan-Meier curves for survival by time-to-fixation category (blue line: internal fixation undertaken within 48 hours, green line: internal fixation undertaken after 48 hours)

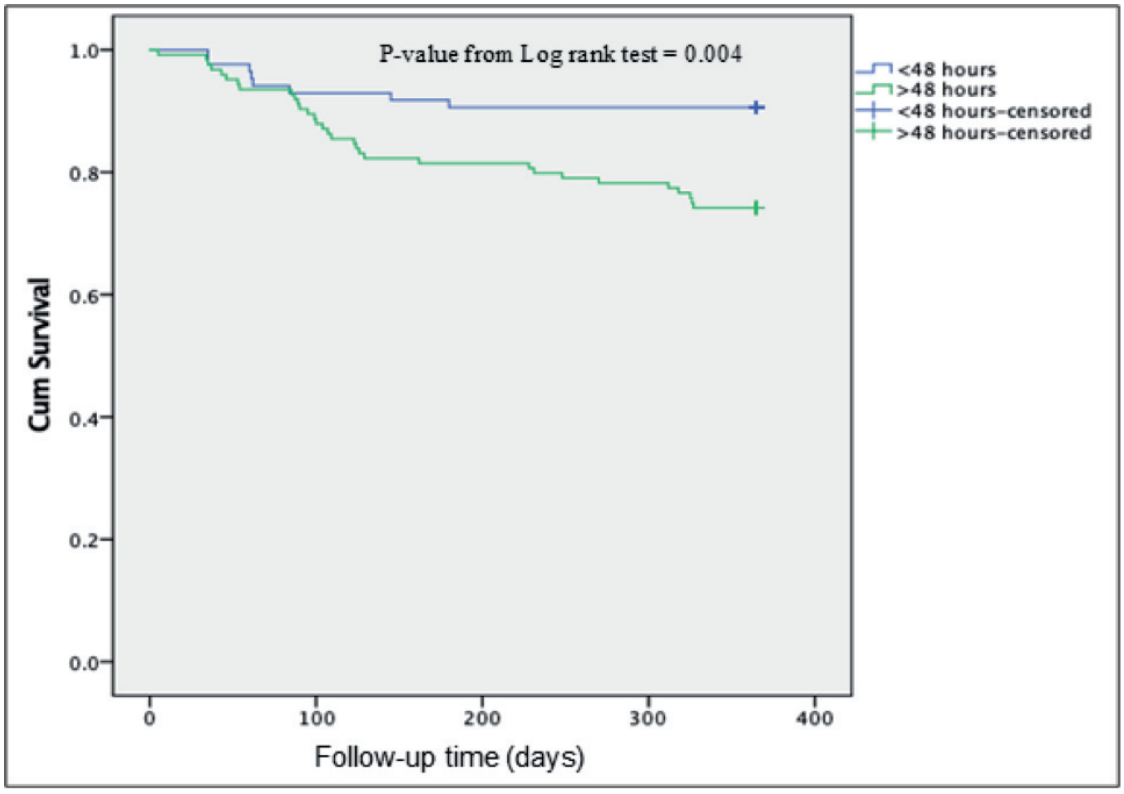

Figure 2 illustrates the Kaplan-Meier survival curves for these surgically managed patients by time to fixation. Patients receiving early internal fixation had better survival than those receiving delayed internal fixation, with 1-year survival for early and delayed fixation being 90 and 75% respectively (log rank p-value 0.004). Of note, survival of the two groups started to differ at approximately 3 months postoperatively.

Table 2 Factors associated with mortality in patients with closed osteoporotic intertrochanteric fracture using univariate and multivariate Cox proportional hazard regression.

Factors	Unadjusted HR (95% CI)	p-value	Adjusted HR (95% CI)	p-value*
Timing to operation				
≤ 48 hrs	1	0.007	1	0.042
> 48 hrs	2.93 (1.35-6.36)		2.29 (1.03-5.10)	
Age, for every 10 years older	2.40 (1.60-3.58)	<0.001	-	-
Gender male vs. female	1.18 (0.59-2.36)	0.640	-	-
Comorbidities yes vs. no	1.01 (0.48-2.12)	0.983	-	-
Type of implants				
Sliding hip screw	1	0.966	-	-
Intramedullary nail	1.02 (0.40-2.61)			
Evans classification unstable vs. stable	0.95 (0.49-1.87)	0.889	-	-
ASA category			-	-
I-II	1	1		
III	1.64 (0.57-4.69)	0.356		
IV-V	3.13 (0.96-10.17)	0.058		
Any postoperative complications yes vs. no	2.98 (1.60-5.55)	0.001	2.43 (1.28-4.62)	0.007

* p-value for hazard ratios (HR) adjusted for all factors in the table and a p-value of <0.05 is considered statistically significant.

Table 2 shows factors associated with the risk of mortality in patients with closed osteoporotic intertrochanteric fracture using univariate and multivariate Cox proportional hazard regression. Factors associated with mortality in univariate Cox regression were time to fixation, age and postoperative complications. Delayed time to fixation was associated with a 2.3-fold

increase in risk of mortality independent of patient's age and whether they had postoperative complications (adjusted HR 2.29 (95% CI 1.03-5.10)). Having any postoperative complications was associated with 2.4-time increased risk of mortality. The risk of death doubled for every 10 years older (HR 2.35 (95% CI 1.57-3.52)). The association remained unchanged even after controlling for sex, comorbidities, ASA classification, Evans classification and type of implants. In multiple logistic regression, the only factor that was associated with development of postoperative complications was time to fixation (Table 3). Delayed surgery had a 3.75-time higher risk of complications than early surgery (adjusted odds ratio 3.75 (95% CI 1.83-7.66)), independent of age, sex, comorbidities ASA category and Evans classification.

Table 3 Factors associated with postoperative complications in patients with closed osteoporotic intertrochanteric fracture using univariate and multivariate logistic regression.

Factors	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value*
Timing to operation				
≤ 48 hrs	1	<0.001	1	<0.001
> 48 hrs	3.97 (1.96-8.07)		3.75 (1.83-7.66)	
Age, for every 10 years older	1.42 (1.04-1.92)	0.025	1.35 (0.98-1.87)	0.065
Gender male vs. female	0.70 (0.37-1.32)	0.274	-	-
Comorbidities yes vs. no	1.19 (0.58-2.44)	0.640	-	-
Type of implants				
Sliding hip screw	1	0.829		
Intramedullary nail	1.11 (0.44-2.80)			
Evans classification unstable vs. stable	0.93 (0.48-1.78)	0.823	-	-
ASA category			-	-
I-II	1			
III	1.08 (0.47-2.50)	0.858		
IV-V	2.31 (0.79-6.76)	0.126		

* p-value for odds ratio (OR) adjusted for all factors in the table and a p-value of <0.05 is considered statistically significant.

Discussion

In this prospective cohort of 209 patients with closed osteoporotic intertrochanteric fracture who underwent early and delayed internal fixation, overall mortality was comparable to previous studies while postoperative complications occurred more frequently than previous studies. Time to fixation was associated with an increased risk of mortality and postoperative complications, with time to fixation of ≥ 48 hours being associated with a 2- and 4-fold higher risk of deaths and postoperative complications than time to fixation of <48 hours.

Mortality of patients with closed osteoporotic intertrochanteric fracture who underwent internal fixation varied across different settings and populations. Overall mortality in our study was comparable to that of previous studies, which reported an overall mortality of 14-25%.[8,22,23] Noteworthy, when considering a subgroup receiving early fixation, the mortality in our study was lower than that of previous studies.[8] This may be explained by a number of reasons. Firstly, the patients in our study were relatively younger than those in the previous ones. Secondly, most previous studies included both neck and intertrochanteric fractures,[8-10,12,18,23,24] while our study specifically examine those with intertrochanteric fracture. Additionally, previous studies appeared to include patients with more serious physical status than our study. That is, previous studies included similar proportions of patients in ASA categories 3 and 4, while in our study, two-thirds of the patients were in the ASA category 3. Also, our study investigated solely patients treated by experienced consultant orthopaedists, while some previous studies examined mortality in the patients treated by orthopedics with varying experiences. Lastly, the disparity in mortality between studies may be explained by the differences in healthcare service systems across populations and countries.

Overall postoperative complications in the present study was higher than that of previous studies.[14-15] This may be explained by that a substantial proportion (almost 60%) of the patients in our study received delayed surgery. However, this may also be due to a number of other factors that are both related and not related to time to operation. These include differences in patient's comorbidity or conditions that need to be stabilized, pre-fracture walking ability, type of health insurance, healthcare system, hospital physical environment, surgeon's workload, hospital's infection control practice and non-aggressive rehabilitation program.[14,18,22,24] Interestingly, studies examined mortality specifically in patients with intertrochanteric fracture undertaking surgery reported higher mortality in practices or institutes or by surgeons that had a smaller number of surgical cases per year,[4] while some other studies did not observed this relationship.[25]

Time to operation has reportedly been a crucial factor for reducing mortality and

complications. Previous studies consistently suggested that patients with hip fractures who received surgery before 48 hours had lower mortality and postoperative complications than those who received surgery after 48 hours.[9-12] Results from a meta-analysis of 35 studies with 191,873 participants and 34,448 deaths[9] and a large retrospective cohort study of more than 400,000 admissions by Colais P, et al.[8] found that patients received surgery within 2 days from hospitalization showed a lower 1-year mortality than those receiving surgery after 2 days. Although the direction of the association was the same, the magnitude of the associations reported in those studies were rather smaller than that of our study.

Time to surgery and risk of mortality may have a continuous linear relationship. A previous study by Beringer, et al[26] further extends our findings by describing survival in several groups of patients with hip fracture who received surgery at different time points. The investigators found poorer survival with more delayed surgery – a 2-year survival of 74%, 60%, 42% and 27% in those receiving surgical treatment at 1 day, 2 days and more than 3 days after admission and those not receiving surgical treatment.[26]

There are many other patient-related factors that have been associated with poor outcomes, especially mortality, of patients with closed osteoporotic intertrochanteric fracture undertaking internal fixation. These include sex, older age and postoperative complications and ASA category.[27-28] Our study was consistent with these studies suggesting that older age was associated with poor survival, but did not find the association between sex and ASA category. These factors are interrelated and may also be related to time to surgery; For example, orthopaedists are likely to delayed surgery in patients with poorer ASA category. Hence, careful interpretation of the association of these risk factors with mortality should be taken. In our study, delayed surgery could be from a variety of factors, some of which are unmodifiable, such as age and co-morbidities. However, our findings on multivariate regression suggest that time to operation was associated with risk of mortality and morbidity independent of age, co-morbidities and ASA physical status.

The present study was among a first few prospective cohort studies to examine outcomes and associated factors in patients with closed osteoporotic intertrochanteric fracture in Thailand, with valid outcome ascertainment and standard statistical analyses used to control for possible confounders. Most previous studies on hip fracture were retrospective cohort studies, in which the issue of data availability and confounding factors cannot be adequately addressed. However, our study had a number of limitations. First, due to the nature of patient clinical follow-up, time to the occurrence of first post-operative complication may not be accurately obtained. Therefore, logistic regression, instead of Cox proportional hazard regression, was used to examine factors associated with the risk of post-operative

complication. Second, sample size was determined based on research question "whether time to fixation was associated with mortality and certain complications", it may be possible that our study was underpowered given. Third, osteoporotic hip fracture in this study was clinically diagnosed, it may be possibility that there may be misclassification due to an inaccuracy in self-reported history of injury. Lastly, time to operation is a proxy of many factors, both administrative and clinical factors. There may be factors that were not accounted for in our study and should be included in future studies.

Conclusions

In this cohort of Thai patients with closed osteoporotic intertrochanteric fracture, one-year mortality and post-operative complications were comparable to previous studies and delayed time to operation of >48 hours was associated with an increased risk of mortality and post-operative complications independent of age and other measures of patient status and disease severity. Our findings underline the importance of a fast-track program for surgical treatment in closed osteoporotic intertrochanteric fracture patients.

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Comparison of complications and mortality in patients with closed osteoporotic intertrochanteric fracture who underwent internal fixation within and after 48 hours in Sunpasitthiprasong Hospital

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ABSTRACT

Background: Osteoporotic intertrochanteric fracture leads to significant morbidity and mortality and increasing evidence suggests that early surgery could improve these outcomes. However, evidence in developing countries is limited. The present study aimed to described mortality and postoperative complications as well as their association with time to surgery in patients with closed osteoporotic intertrochanteric fractures who underwent internal fixation in a tertiary hospital.

Methods: In this prospective cohort study, sociodemographic and clinical data of 209 closed osteoporotic intertrochanteric fracture patients treated at Sunpasitthiprasong hospital were collected. Mortality, mortality rate and occurrence of complications were computed. Survival time was defined as suration between date of surgery to date of death, or 12 months for those who survived. Kaplan-Meier curves were plotted and survival was compared using the log rank test. Factors associated with risk of mortality and morbidity were analyzed using Cox proportional hazard regression and logistic regression.

Results: The average (SD) age of patients was 76.6 (10.9) years, with 65% being females. Among 209 patients, 40 died, a 1-year mortality of 19.1%, with lower mortality in those with early than delayed internal fixation (9.4% and 25.8% respectively). Over 1 year of follow-up, 61 patients (29.2%) developed at least one complication. Patients receiving internal fixation after 48 hours had a 2.3-fold higher risk of mortality and an almost 4-fold higher risk of postoperative complications than those receiving internal fixation within 48 hours (Adjusted hazard Ratio 2.29 (95% CI 1.03-5.10)) and Adjusted odds ratio 3.75 (95% CI 1.83-7.66) respectively)). These associations were not altered after controlling for age, sex, comorbidities, ASA category, Evans classification and type of implants.

Conclusions: Delayed surgery was associated with an increased risk of mortality and post-operative complications in patients with closed osteoporotic intertrochanteric fracture undertaking internal fixation. This underlines the importance of a fast-track program for surgical treatment in this groups of patients.

Keywords: osteoporosis, intertrochanteric fracture, mortality, postoperative complications, early and delayed internal fixation.

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