STUDY OF SEVERAL CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS OF INTERTROCHANTERIC CREST FRACTURES AND/ OR FEMORAL NECK FRACTURES IN ELDERLY PATIENTS TREATED AT NGHE AN HOSPITAL FOR TRAUMATOLOGY AND ORTHOPAEDICS (2010 – 2021)

Major: Epidemiology
Code   : 97201 17

SUMMARY OF MEDICAL DOCTOR'S THESIS

Hanoi - 2022

THE WORK IS FINISHED AT

CENTRAL INSTITUTE OF MALARIOLOGY, PARASITOLOGY AND ENTOMOLOGY

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This thesis is defended before the institute-level thesis examination council met in Central Institute of Malariology, Parasitology and Entomology
At......... o'clock, on...... day........month......... 2022

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LIST OF THESIS-RELATED PUBLICATIONS OF THE AUTHOR

No.	Name of publication
1	Nam H Nguyen, Le H Nguyen, Khoa V Vu, Chinh D Duong, Loi B Cao, Anh T Le (2021), Clinical characteristics and factors influencing waiting time to surgery and lengh of stay in elderly patients with hip fractures, *Genij Ortopedii*, Vol.27, no.6:pp.686-692
2	Nam NH, Minh ND, Hai TX, Sinh CT, Loi CB, Anh T Le (2022), Preoperative Factors Predicting 6-month Mortality and the Functional Recovery in elderly patients With hip fractures, *Original Study – Malaysian Orthopeadic Jounal*, *Ananymised Manuscript Hip tracture*, Vol.2021-151R1, pp.1-9
3	Nguyen Hoai Nam, Tran Quang Phuc, Nguyen Quang Thieu (2022), Study of hip hemiarthroplasty results in elderly patients after intertrochanteric crest fractures and/ or femoral neck fractures in Nghe An Hospital for Traumatology and Orthopaedics 2021 – 2022, *Journal of Community Medicine,* Vol. 4, pp.

INTRODUCTION

Intertrochanteric crest fracture and/ or femoral neck fracture is the common disease of the elderly caused by trauma or accident in living activities, it consequences are the surgical deformation of bone. Several associated factors are osteoporosis, diabetes and kidney failure. The study of Díaz AR(2018) shows that the ratio of female patients is higher than male patients, advanced age, with 5 – 9 side sicknesses and in combination with falling down because of accident [1], [2].

Its object is the elderly and the number of patients is estimated to increase double in 2050 because of population aging process. Nowadays, the intertrochanteric crest fracture and/ or femoral neck fracture is the medical problem which should be solved [3]. In America, according to database of national surgical quality improvement program of US from 2006-2015, there were 17,122 intertrochanteric crest fracture and/or femoral neck fracture patients.The popular treatment method is hip replacement [4]

Vietnam is a developing country and the tendency of aging population is fast. It is estimated that until 2049, more than ¼ people per total population are 60 years of age and above [5]. The intertrochanteric crest fracture and/ or femoral neck fracture cases will increase, however there are very few information on this trauma about clinical, para-clinical characteristics and identification of preoperative factors related to waiting time for surgery (WTS – intervention) and postoperative factors as length of stay (LOS), the operating results in intertrochanteric crest fracture and/ or femoral neck fracture patients [4], [6]. In the area of Nghe An, in each year, there are hundreds of elderly patients operated intertrochanteric crest fracture and/ or femoral neck fracture. But until now, there is no study of this problem.…Thanks to urgency of this problem, we conduct the thesis: *Study of several clinical and epidemiological characteristics of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients treated at Nghe An Hospital for Traumatology and Orthopaedics (2020 – 2021)*, which aims at:

1. Describing several clinical and epidemiological characteristics of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients treated at Nghe An Hospital for Traumatology and Orthopaedics (2020 – 2021).

2. Evaluating the treatment results of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients.

**NEW CONTRIBUTIONS AND SCIENTIFIC MEANINGS,
PRACTICAL MEANINGS OF THESIS**

This is the first time to research deeply and methodically by scientific researching methods with description and comparative analysis of before and after treatment of intertrochanteric crest fractures and/ or femoral neck fractures in Nghe An, with suitable sample size with deep analyses of variables describing the clinical, para-clinical characteristics and findings of intervention method of hip hemiarthroplasty and internal fixing for patients ≥ 60 years and age after intertrochanteric crest fractures and/ or femoral neck fractures. On the other hands, this is the first time when Vietnam has a study on factors related to length of stay and estimating the results after 6 intervening months for hip hemiarthroplasty and internal fixing patients.

STRUCTURE OF THESIS

The thesis covers 121 pages, including: 2 pages of Introduction; Overview: 33 pages; Research objects and methods: 20 pages; Research findings: 32 pages; Discussion: 32 pages; Conclusion: 2 pages. The thesis has 6 figures, 41 datasheets and 10 appedixes. There are 120 reference documents, 60% references are conducted for recent 5 years.

Chapter 1:
OVERVIEW OF DOCUMENT
1. 1. Overview of intertrochanteric crest fractures and/ or femoral neck fractures

Intertrochanteric crest fractures and/ or femoral neck fractures are bone fractures in the area from below intertrochanteric crest to near sphere frustum. According to classification of Garden, they are classified into incomplete fracture, complete fracture with little swerve; Complete fracture with connection between broken faces; Complete fracture in all aspects [7].

1.2. Several clinical and epidemiological characteristics of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients

1.2.1. Situation of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients over the world

The object of intertrochanteric crest fractures and/ or femoral neck fractures is mainly the elderly. Surgery is appointed for most of these bone fractures. The internal fixing treatment is applied for not very elderly patients with not heavy osteoporosis, good opportunity of bone healing and

the fixing treatment is only applied for very elderly patients, complex fracture, catching many background diseases, poor prognosis if they undergo major surgery. It is estimated that the cases will increase double in 2050 because of average age increasing and population ageing process over the world. Nowadays, the intertrochanteric crest fracture and/or femoral neck fracture is the medical problem which should be considered and solved [3], [8]. In the world, there are many clinical and epidemiological study of intertrochanteric crest fractures and/ or femoral neck fractures and efficiency of intervention methods: Marks R(2010), epidemiologically statistical analysis of intertrochanteric crest fractures and/ or femoral neck fractures and risk factors, in period (1970 – 2009) over the world. He recognizes that this disease frequently cause early death, the increase of patients is caused by population ageing. The intertrochanteric crest fractures and/or femoral neck fractures are still the global serious health problem [9]. Masoud ShayestehAzar (2016) recognizes that the ratio of female patients and dead patients is higher than male (p < 0,01) [10]. Lehtonen EJI (2018). According to US's study with database of national surgical quality improvement program from 2006 – 2015, there are 17.122 patients, 70% patients are female and their average age is 80.1 age. The probability of catching intertrochanteric crest fractures and/ or femoral neck fractures is 9.8% (SD ± 5,2) [4].

1.2.2. Situation of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients in Vietnam

Until now, there is no statistics of situation of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients in the whole country, but it is only mentioned in separate scientific reports. Currently, in almost provincial hospitals, the technologies of hip replacement and internal fixing have been implemented [12]. All of studies confirm that risk factors related to intertrochanteric crest fractures and/ or femoral neck fractures include old age, osteoporosis, falling down… The study of Tran Trung Dung and et al. (2014) shows that the average age is 65.7 ± 8.3, ratio of female/ male patients is 2/1, there are 86.7% osteopenis patients from -2.5 to -1.5 [13]. The study of Duong Dinh Toan and et al. (2019) shows that the average age is 81.8, ratio of female/ male patients is 2/1, ratio of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients occupies 71% among total bone fracture cases in the elderly [14].

1.3. Several factors related to intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients

1.3.1. Structure of cortical bone

According to results of many studies, we can see that there is a connection of intertrochanteric crest fractures and/ or femoral neck fractures and structure of cortical bone, it is proved by studies:

Thanks to development of science, especially genetic science, about gene structure, mathematics and X-ray images, many applications are applied into reality in order to estimate the risks of intertrochanteric crest fractures and/ or femoral neck fractures. In 2020, Salih Beyaz and et al. identified that there was a connection between smaller and thinner structure of femoral neck and probability of intertrochanteric crest fractures and/ or femoral neck fractures when he combined the X-ray images and deep analysis of genetic algorithms to identify the risks of femoral neck fractures [19]

1.3.2. Factors of age, sex, osteoporosis and mechanical impacts

The studies of scientists in the world show that the factors of age, sex, especially osteoporosis and mechanical impacts relate to intertrochanteric crest fractures and/or femoral neck fractures. Osteoporosis can be met in cases of intertrochanteric crest fractures and/ or femoral neck fractures with high ratio, it may be 90% somewhere. The ratio of osteoporosis in the elderly in Vietnam is > 50.0% [20], [21], [22]. It is confirmed through researching results of authors:

- Nguyen Trung Hoa (2014), by bone density measuring method according to DXA method (*Dual Energy X ray Absorptiometry*) in Ho Chi Minh City, it showed that the ratio of osteoporosis and low bone density was 100.0% number of researched elderly patients, in which: Ratio of osteoporosis patients was 65.1%, ratio of patients with low bone density was 34.9% [21].

- Dao Thi Thanh Nhan and et al. (2019), researched the situation of osteoporosis in women of menopause ages by bone density measuring technique for 194 women, findings: The ratio of general osteoporosis cases was 83.0%, in which the ratio of spine, lumber osteoporosis cases was 59.8%, and the ratio of osteoporosis cases in femoral neck was 23.2% [20].

- The statistical and epidemiological analysis of intertrochanteric crest fractures and/ or femoral neck fractures and risk factors, in period (1970 – 2009) over the world, Marks R(2010), recognized that the decisive factors of bone fractures included age, osteoporosis and falling down, several affecting factors include poor social and economic conditions [9].

- Korkmaz MF(2014), researched 100 cases of intertrochanteric crest fractures and/ or femoral neck fractures in the elderly by driving a nail

into bone head. Characteristics of this patient group were: the average age was 77.66; the ratio of female/ male was 2.2/1. The results of bone head nailing technology were satisfactory, the ratio of bone combination was high > 95%, the ratio of secondary fracture decreased, there was no avascular Necrosis case [23].

- Kosola J and et al. (2017), researched the postoperative complications after treating intertrochanteric crest fractures and/ or femoral neck fractures in 154 male patients with alcohol addiction syndrome. The alcohol addiction syndrome was identified as diagnosis in medical record. The ratio of male patients with alcohol addiction syndrome suffered from intertrochanteric crest fractures and/ or femoral neck fractures was 62% after 1 year and 49% after 2 years. The male patients with alcohol addiction syndrome occupied a half of patients < 70 years of age with low energy bone fractures [24].

- Lehtonen EJI , in 2018, he collected from US national data source among 17,122 patients, in which 70% patients were female, the ratio of female/ male was 2.3/1. The conclusions were: the ratio increases according to age, depending on Body mass index (BMI), the ratio of patients increase when patients have the underground diseases as diabetes, smoking….[4]

- When any patient had an intertrochanteric crest fracture and/ or femoral neck fracture for the first femur, he had a risk of intertrochanteric crest fracture and/ or femoral neck fracture for the second femur according to report of Juhász K and et al (2016), researching 3,783 patients (917 males, 2.866 females, ratio of male/ female = 3.1/1) treated the intertrochanteric crest fracture and/ or femoral neck fracture, occupying 70% per total patients with bone fractures. The multivariate regression analysis on survival rate of Kaplan-Meier and evaluation of prognostic factors, such as: age, sex, living place, primary bone fracture kind and survival intervention, treatment hospital. Findings: 312 (8.2%) intertrochanteric crest fracture and/ or femoral neck fracture patients for the second femur. The univariate regression analysis showed that the risks of intertrochanteric crest fractures and/ or femoral neck fractures for the second femurs for elderly patients were significantly higher ($p = 0.001$), female patients ($p = 0.022$), patients living in urban areas ($p = 0.024$) and patients with degenerative arthritis ($p = 0.001$). He recommends that women, elderly people and operated people [25].

1.3.3. Patients with underground diseases

Chronic diseases also have impacts on health of whole body as nutrition, endocrine, metabolism…, which reduces the resistance of body, and consequently reducing or disordering the calcium absorption, especially

elderly people and lack of vitamin D leads to poor calcium absorption metabolism, consequently the osteoporosis situation lengthens at degree 1, degree 2 even degree 3. If osteoporosis is combined with mechanical factors as falling down, trauma…, the probability of intertrochanteric crest fracture and/ or femoral neck fracture is very high.

Nakanishi K(2018), researched the bone density of femoral neck among 293 patients undergone hemodialysis. He measured Rd and FN BMD by double energy X-ray absorbing method and considering the blood testing results, including: Hb, albumin, blood urea, creatinine, calcium, Alkaline Phosphatase and intact parathormone. The general risk factors of osteoporosis as low body mass, old age, muscular mass loss and malnutrition fave impacts on FN BMD. In addition, FN BMD had a risk of bone fracture equally to patients undergone hemodialysis [26].

Díaz AR(2018), concluded that the intertrochanteric crest fractures and/ or femoral neck fractures related to female patients and old age, in combination with previous side sickness and falling down caused by accident. The study was conducted for 428 patients 65 years of age and above hospitalized for treating intertrochanteric crest fractures and/ or femoral neck fractures. In 2015, 220 patients had femoral neck fractures (51.4%), femoral neck fractures related to cerebral vessel diseases ($p = 0.039$), by regression analysis of this relation in case of cerebral vessel diseases (OR 2,6, 95% CI 1,1-6,4) and presence of $5 – 9$ underground diseases (OR 1,5, 95%CI:1,1-2,3). [1].

Vitamin D played a role of absorbing and converting calcium. Fakler JK (2016), researched the intertrochanteric crest fractures and/ or femoral neck fractures with low energy and risk factors and impacts of 25-hydroxy vitamin D and protein reacting C for medical postoperative complications and death after 1 year. The patients with inflammation reactions (CRP $\geq$ 40 mg/dL) showed that the ratio of dead patients for 1 year was higher than 40% in comparison with patients without inflammation reactions (CRP <10 mg/dL) ($p = 0.002$). He concluded that the elderly patients with low-energy intertrochanteric crest fractures and/ or femoral neck fractures 25 (OH) D related independently with medical postoperative complications and CRP as independent estimation factor about death rate within one year [27].

1.3.4. Secondary intertrochanteric crest fractures and/ or femoral neck fractures

In reality, many patients have clinical, para-clinical symptoms of intertrochanteric crest fractures and/ or femoral neck fractures appointed operation. Because they have underground diseases, thus their femoral

bones and hip bones are weak and some patients have a specific rate of secondary fractures in and after surgery. Several researching works of scientists report the situation of femoral and hip fractures in and after surgery:

- Hong CC and et al. (2018), recognized that 28/271 patients (10.3%) had femoral fractures caused by surgery and 14.7% patients had the implicit risks of bone fracture in and after surgery. The most popular position of these bone fractures are at intertrochanteric crest and femoral neck [28].

- Juhász K and et al. (2016), the regression study in the whole country of Hungary showed that the risks of secondary intertrochanteric crest fractures and/ or femoral neck fractures for females were higher than males and directly proportional to age, people living in cities and the patients undergone joint endoscopy had the risk of secondary intertrochanteric crest fractures and/ or femoral neck fractures higher than people living in rural areas [25].

1.3. Treatment of intertrochanteric crest fractures and/ or femoral neck fractures

1.3.1. Treatment techniques: Most of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients are treated by surgery with techniques of hip hemiarthroplasty and total hip arthroplasty; Bones are combined by internal fixing…

1.3.2. Accidents, complications in and after surgery

The accidents as death: Avascular Necrosis; Secondary intertrochanteric crest fractures and/ or femoral neck fractures after surgery; Incision infection. Especially in elderly patients with very poor immune and they frequently have other side illnesses, such as: diabetes, hypertension, osteoporosis, kidney failure… [4]

- **Re-operation:** In techniques for treating intertrochanteric crest fractures and/ or femoral neck fractures, a specific ratio of patients will be re-operated because of many reasons, such as: inequality (bone inclination), unequal bone, narrow groin joint… The study of Anne M Nyholm and et al. (2020), 654 patients had inclinations, the average age was 69, 19% patients was re-operated, in which 18% patients was dead after re-operation, almost patients undergone operation after 24 hours had the ratio of dead and bone fractures in type of Garden IV [61].

- **Attack of delirium after hip joint replace surgery:** Early delirium relates to bad prognosis of patients and they maybe dead. This is totally suitable to characteristics of elderly patients. On the other hand, the

situation of delirium reflects bad postoperative prognosis for patients.

  - Postoperative Avascular Necrosis: Avascular Necrosis is the necrosis situation caused by nutrition lack, the blood vessels do not develop to bones and muscles after operation to provide nutrition. The patients suffered from Avascular Necrosis frequently occupy high ratio only after infection and do not combine after operation. The study of Osarumwense D and et al. (2015) showed that the ratio of avascular necrosis patients was 6% and 8% identified for bone fractures which cannot be replaced and inclination correlatively [65].

1.4. Prevention of intertrochanteric crest fractures and/ or femoral neck fractures

  Prevention of intertrochanteric crest fractures and/ or femoral neck fractures in 3 levels: Remote prevention to reduce the ratio of intertrochanteric crest fractures and/ or femoral neck fractures; Discovering, intervening early the intertrochanteric crest fractures and/ or femoral neck fractures by suitable techniques in order to each the optimal treatment results and to limit the negative consequences of late intervention [75].

Chapter2: RESEARCH METHODS

2.1. Research methods. Target 1*: Describing several clinical and epidemiological characteristics of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients treated at Nghe An Hospital for Traumatology and Orthopaedics (2020 – 2021).*

2.1.1. Research object, place and time

  - Research object:

The patients treated intertrochanteric crest fractures and/ or femoral neck fractures are the elderly (≥ 60 years of age)

  - Reseach place:

In Nghe An Hospital for Traumatology and Orthopaedics.

  - Research time:

  From 1/1/2020 to 31/12/2021.

2.1.2. Research method:

  - Research design:

  This study is designed by descriptive epidemiological researching method with analysis [78], [79]:

  - Research sample size:

The formula is applied to calculate the sample size for desciptive study to identify a ratio of current patients:

$$n = Z^2_{1-\alpha/2} \frac{1-p}{p\varepsilon^2}$$

In which: p: is the ratio of osteoporosis, bone lacking in patients with intertrochanteric crest fractures and/ or femoral neck fractures, selecting p = 0,7 [14], [25]; $Z_{1-\alpha/2}$: reliability coefficient, corresponding to reliability 95%, $Z_{1-\alpha/2}$ = 1,96; ε: Desired relative error, selecting ε= 0,12. With selected values, the calculated sample size is 114. Iin reality, the study is conducted in 118 patients.

- ***Standard and method of sample selection***: Sampling all patients qualified to diagnose the intertrochanteric crest fractures and/ or femoral neck fractures ≥ 60 years of age. Eliminating patients who do not agree to participate into study, patients of metal diseases.

- ***Research contents:*** Describing the general information on research object; describing the clinical and epidemiological characteristics of intertrochanteric crest fractures and/ or femoral neck fractures [7]. Describing the reasons of intertrochanteric crest fractures and/ or femoral neck fractures [7].

- ***Variables in research:*** They include age, sex, living place, length of stay, variables on hematology and biochemistry when hospitalizing as: Hb; Protein; CRP; Urea; Ka; Na; Bone density (T-score),...

- ***Techniques used in research:*** Clinical examining technique [7]. Radiographing technique of groin joint, hip bone, femoral bone to identify the calcium density of bone: T-score values are classified according to targets of World Health Organization [80], as follows: Normal (> -1.0 and above); Low bone density reduction (from 1 to -2.5), osteoporosis < -2.5; Testing technique of hematology and biochemical testing index according to WHO, US-CDC. Anemia when hospitalizing is defined as concentration of hemoglobin under 7.5 mmol/L [12g/ dL] in female and under 8.1 mmol/L [13 g/ dL] in male [80]. The patients with plasma glucose at any time ≥200 mg/dL (11,1 mmol /L) or plasma glucose when hungry ≥ 126 mg/dL (7,0 mmol /L) are considered as hyperglycemia [83]. Systolic blood pressure (HA) ≥ 140 mm Hg and/ or diastolic blood pressure ≥ 90 mm are identified as high blood pressure [81]. The reference values of testing parameters are as follows: sodium 135–145 mmol/L, potassium 3,6–5,0 mmol/L, chlorine 95–107 mmol/L, calcium (total) 2,1–2,6 mmol/L, urea 2,5–6,6 mmol/L, creatinin 60–120 µmol/L [84]. C reaction protein is identified as follows: smaller or equal to 10.0 mg/ dL: increasing normally or avergely, more than 10.0 mg/dL: increasing significantly [85].

- *Evaluation indices:* Several information on research object; Evaluation standard, classification of intertrochanteric crest fractures and/ or femoral neck fractures of Garden [7]. The indices of intertrochanteric crest fractures and/ or femoral neck fractures ratio according to sex because of falling down, underground diseases and according to age.

2.2. Research method. Target 2: *Evaluating the treatment results of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients*

2.2.1. Research object, place and time

- *Research object:*

Patients diagnosed and identified as intertrochanteric crest fractures and/ or femoral neck fractures in Target 1 and they agree to participate into research.

- *Research place:*

In Nghe An Hospital for Traumatology and Orthopaedics.

- *Research time:*

From 1/1/2020 to 31/12/2021.

2.2.2. Research method

- *Research design:* The study is designed by treatment intervention research without control group and comparison before and after [78], [79].

- *Research sample size:*

All patients $\geq$ 60 years and age dare diagnosed and identified as intertrochanteric crest fractures and/ or femoral neck fractures in Target 1 and they agree to participate into research.

- *Research contents***:**

Evaluating the intervention results by: operation time (hours); length of stay; pain degree evaluation; Walk result evaluation; Walking ability and distance; sitting on chair; distorted extremities…

- *Evaluating the post-operative results after 1, 3 and 6 months:*

Using Haris standard with maximal score 100, in details: from 90 – 100 scores are excellent; from 80 – 89 scores are very good; from 70 – 79 scores are good; from 60 – 69 scores are average; < 60 scores are poor [88].

- *Variables in researching:*

In Target 1, there are variables: Operation time; Length of stay (LOS), infection situation; Post-operative complications; Radiographing results; Walk, walking ability; stairs climbing ability; extremity deforming situation; ability of sitting on chair; Total amplitude of hip joint exercising; Evaluation results according Harris within 1, 3 and 6 months after hip joint

replacing operation, with maximal score 100, in which: from 90 – 100 scores are excellent; from 80 – 89 scores are very good; from 70 – 79 scores are good; from 60 – 69 scores are average; < 60 scores are poor [88].

- Techniques used in research:

Hip hemiarthroplasty and internal fixing [44]

- Post-operative result evaluation indices:

Ratio of short extremities after 1, 3 and 6 months; Ratio of avascular necrosis after 1, 3 and 6 months; Evaluation indices on prognosis after 1, 3 and 6 months. Delirium evaluation based on method of Glasgow [7] with score system 0 – 15: From 0 – 3 scores are dead; From 4 – 8 scores are heavy; From 9 – 12 scores are average; From ≥ 13 – 15 scores are slight.

2.3. Date processing and analyzing methods

The statistical analyses are done by SPSS software with version 16.0. For continuous variables, t Student audit or correlative Pearson. The classification variables are created from WTS and LOS to use in multivariate analysis [78].

2.4. Errors and error limitation

Guaranteeing to have enough minimal samples in researching; Clear researching standards. Implementing well the screening works for selecting patients into research samples. Cleaning data before processing and analyzing data; Using suitable software for research variables.

2.5. Ethics in researching

There are enough ethical documents in researching; Guaranteeing to implement responsibilities committed of researcher and rights of research participants. Implementing exactly the operative technical procedures and patient caring procedures. Only researching voluntary patients.

Chapter 3: FINDINGS

3.1. Several clinical and epidemiological characteristics of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients treated at Nghe An Hospital for Traumatology and Orthopaedics (2020 – 2021).

3.1.1. Several information on research object

Table 3.1. Characteristics on age, sex and living place (n =118)

Researching variables		Number	Ratio (%)
Age (year)	60 - 69	20	16,94
	70 – 79	27	22,88
	80 – 89	36	30,52
	≥ 90	35	29,66
	General	118	100,0
Sex	Male	37	31,55
	Female	81	68,45
	General	118	100,0

The patients in age group 80 – 89 occupy 30.52% and the patints in age group ≥ 90 occupy 29.66%. Ratio of female patients is 68.45% and male 31.55%.

Table 3.2. Ratio of patients with 1, 2 and ≥ 3 underground diseases in the elderly with intertrochanteric crest fractures and/ or femoral neck fractures (n =118)

Situation of underground disease		Number	Ratio (%)
1 underground disease	Male ($n_1 = 37$)	29	78,37
	Female ($n_2 = 81$)	42	51,85
	General (n =118)	71	60,17
2 underground diseases	Male (($n_1 =37$)	4	10,81
	Female ($n_2 = 81$)	35	43,20
	General (n =118)	39	30,05
≥ 3 underground diseases	Male ($n_1 = 37$)	1	2,70
	Female ($n_2 = 81$)	4	4,93
	General (n =118)	5	4,23
General	Male ($n_1 =37$)	34	91,89
	Female ($n_2 = 81$)	81	100,0
	General (n =118)	114	96,61

The ratio of researching objects suffered from general underground

diseases is 96.61%, in which 91.89% for male and 100.0% for female.

3.1.2. Clinical intertrochanteric crest fractures and/ or femoral neck fractures

Table 3.4. Symptoms and signs of elderly patients with intertrochanteric crest fractures and/ or femoral neck fractures when hospitalized (n =118)

Symptoms		Number	Ratio (%)
Pain	With pain (1)	115	97,46
	Without pain (2)	3	2,54
	Total	118	100,0
Hip joint deformation	With deformation (1)	81	68,64
	Without deformation (2)	37	31,36
	Total	118	100,0
Reduction, loss of extremity movement	Loss of extremity movement (1)	85	72,0
	Reduction of extremity movement (2)	33	28,0
	Total	118	100,0

Ratio of painful patients is 100.0%, in which pain 97.46%; slight pain 2.54%; Ratio of patients with extremity deformation is 68.64%; Ratio of extremity movement loss is 72.0%.
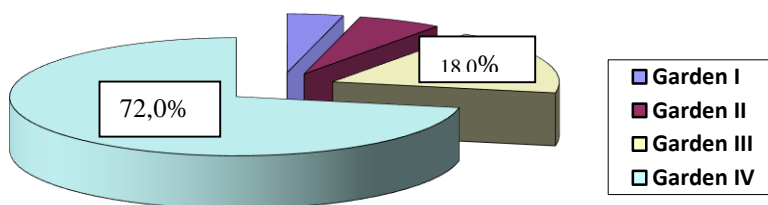
Figure 3.1. Ratio of intertrochanteric crest fractures and/ or femoral neck fractures under Garden classification (n =118)

Ratio of intertrochanteric crest fractures and/ or femoral neck fractures under Garden type IV is 72.0%, Garden fracture types I, II, III occupy low ratio 4.0 % (5/118), 6.0 (7/118) and 18.0% (21/118).

- Reasons and length of stay in research object

The length of stay is the time from trauma until being hospitalized, the findings are as follows:

Table 3.5. Reasons of intertrochanteric crest fractures and/ or femoral neck

fractures from trauma until being hospitalized (n =118)

Reasons of intertrochanteric crest fractures and/ or femoral neck fractures		**Number**	**Ratio (%)**	**Value p**
Reasons	Falling down (1)	107	90,7	$p_{1-2,3} =$ 0,033
	Traffic accident (2)	5	4,2	
	Natural fracture (3)	6	5,1	
	Total	118	100,0	
Time from trauma to being hospitalized (hours)	Before 48 hours (1)	15	12,7	$p_{1-2} =$ 0,00
	After 48 hours (2)	103	87,3	
	Total	118	100,0	
	Average (hours)	52,1 $\pm$ 33.9		

Ratio of patients $\geq$ 60 years of age with intertrochanteric crest fractures and/ or femoral neck fractures caused by falling down in living activities is 90.7%; The average length of stay is (52.1 $\pm$ 33.9) hours; The difference with statistical meaning between ratio of early hospitalized patients and ratio of lately hospitalized patients is 12.7% in comparison with 87.3%, p < 0.01.

3.1.3. Para-clinical testing results of elderly patients with intertrochanteric crest fractures and/ or femoral neck fractures

Table 3.7. Ratio of patients with anaemia, protein decrease, albumin decrease in elderly patients with intertrochanteric crest fractures and/ or femoral neck fractures when hospitalized (n =118)

Testing indices	Hematology testing results		
	Male (37)	Female (81)	General (118)
Number, ratio (%) of patients with anaemia	29(78,37%)	67(82,71%)	96(81,35%)
Number, ratio (%) of patients with protein decrease	8(21,62%)	6(7,40%)	24(20,33%)
Ratio of patients with albumin decrease	21 (56,75%)	57(70,37%)	78(66,10%)

Ratio of patients with anaemia 81,35%(96/118), blood albumin decrease 66,10%.

Table 3.9. Ratio of biochemical indices decrease, increase in elderly patients with intertrochanteric crest fractures and/ or femoral neck fractures (n = 118)

Testing indices	**Number, ratio (%)**		
	Male (1)	Female (2)	General(118)
CRP increase >10 mg/dL)	23 (62,16%)	60 (79,01%)	83 (70,43%)

Urea increase (> 6,6 mmol/L)	15 (40,54%)	24 (29,62%)	39 (33,05%)
Creatinin increase (>120 µmol/L)	1 (2,70%)	0 (0,0%)	1 (0,55%)
Na decrease (< 145 µmol/L)	21 (56,75%)	40(49,38%)	57 (48,30%)
Calcium decrease (< 2,1mmol/L)	7 (18,91%)	25(30,86%)	32 (27,11%)
Kali decrease (<3,6 mmol/L)	11 (29,72%)	11(13,58%)	22 (18,64%)
Chloride increase (>107mmol/L)	4 (10,81%)	14(17,28%)	18 (15,25%)
Electrolyte disorder	25 (67,56%)	57(70,37%)	82 (69,49%)

Ratio of CRP increase patients is 70.33%; Electrolyte disorder 69.49%; Na decrease 48.30%; Blood calcium decrease 27.11%; Urea increase 33.05%.

- Surgery waiting time: For 115 treated patients, the results are: The average surgery waiting time is 48.1 ± 5.9 hours. The median of surgery waiting time is 52.1 hours in the group of patients undergone hip hemiarthroplasty and 47 hours in the group of patients undergone internal fixing. The quartile range is 43 hours.

3.2. Treatment results of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients treated at Nghe An Hospital for Traumatology and Orthopaedics

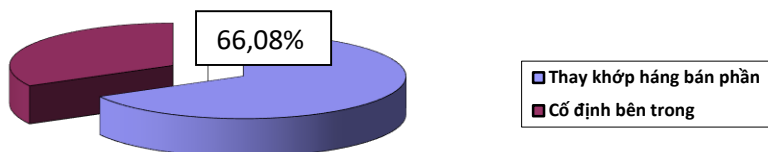**3.2.1. Treatment appointment and post-operative delirium**

- Treatment appointment

Figure 3.2. Ratio of patients treated by hip hemiarthroplasty and internal fixing (n = 115)

The ratio of patients treated by hip hemiarthroplasty is 66.08% and ratio of patients treated by internal fixing is 33.91%.

- Delirium after implementing treatment techniques

Delirium is evaluated according to Glasgow scale, the results:

Table 3.15. Post-operative delirium (n=115)

Time	Delirium	Number	Ratio(%)	Value p
Before 24 hours after operating (1)	With delirium	45	39,10	
	Without delirium	70	60,90	
	Total	115	100,0	$p_{1-2,3} = 0,027$
From (24 – 48) hours after operating (2)	With delirium	18	15,65	
	Without delirium	97	84,35	
	Total	115	100,0	
After 48 hours (3)	With delirium	05	4,35	
	Without delirium	110	95,65	
	Total	115	100,0	

The ratio of patients with delirium decreases from 39.1 within 24 hours to 15.65% after 24 hours and 4.35% after 48 hours, this difference has the statistical meaning $p < 0,05$.

3.2.2. Treatment results of patients treated by hip hemiarthroplasty

Table 3.18. Ratio of unequal extremities through clinical examination and radiographing after 6 hip hemiarthroplasty months(n =73)

Research variable	Intervention results	
Unequal degree (cm)	Number	Ratio (%)
< 1 (1)	71	97,26
From (1-2)(2)	2	2,74
> 2 (3)	0	0,0
Total	73	100,0
Value p	$p_{1-2,3} = 0,00$	
Radiographing results	Number	Ratio (%)
Neutral (1)	72	98,63
Inside distortion (2)	1	1,37
Outside distortion (3)	0	1,25
Total	73	100,0
Value p	$p_{1-2,3} = 0,00.$	

* Neutral: means in correct surgical position, without inside distortion and without outside distortion.

The difference has the significant meaning between unequal < 1 cm in comparison with unequal (1-2) cm, with ratios 97.26% compared with 2.74%, $p < 0.01$. On X-ray film, the neutral kinds occupy 98.63% (72/73).

Table 3.24. Summary of results of hip hemiarthroplasty under Harris scale after 6 treatment months

Classification of total active motion	Evaluation results		Value p
	Number	Ratio (%)	
Very good (90 – 100) scores (1)	65	89,04	$p_{1-2,3} =$ 0,039
Good (80 – 89) scores (2)	7	9,58	
Average (70 - 79) scores (3)	1	1,37	
Poor < 70 scores (4)	0	0,00	
Total	73	100,0	
Average (score)	$86,83 \pm 5,7$		
Fmax - Fmin (score)	78 – 99		

This difference has statistical meaning between ratio of very good scores and ratio of good scores and average scores 89.04% in comparison with 9.58% and 1.37%, $p < 0,05$.

After 6 months, no patient is at the poor level < 70 scores.

3.2.3. Treatment results of patients treated by internal fixing

Table 3.26. Ratio of unequal extremities through clinical examination and radiographing in patients treated by internal fixing (n =39)

Research variable	Intervention results		Value p
Unequal degree (cm)	Number	Ratio (%)	
< 1 (1)	37	97,37	$p_{1-2} = 0,00.$
From (1-2) (2)	1	2,63	
> 2 (3)	0	0,0	
Total	38	100,0	
Radiographing results	Number	Ratio (%)	
Neutral (1)	37	97,37	$p_{1-2,3} = 0,00.$
Inside distortion (2)	1	2,63	
Outside distortion (3)	0	0,0	
Total	38	100,0	

* *Neutral: means in correct surgical position, without inside distortion and without outside distortion.*

There are 97.37% patients with unqual extremities < 1 cm (37/38), (average level), this difference has the statistical meaning between unequal < 1 cm and unequal (1-2) cm, with ratios 97.37% compared with 2.63%, with $p < 0.01$. On X-ray film, the neutral kinds occupy 97.37% (37/38); This difference has the statistical meaning between neutral ratio with Inside distortion (97.37% compared with 2.63%, $p < 0.01$).

Table 3.32. Summary of results of internal fixing
under Harris scale after 6 treatment months (n =39)

Classification	Intervention results		Value p
	Number	Ratio (%)	
Very good (90 – 100) scores (1)	30	78,95	
Good (80 – 89) scores (2)	8	21,05	p_{1-2}= 0,039
Average (70 -79) scores (3)	0	0,0	
Poor < 70 scores (4)	0	0,0	
Total	38	100,0	
Average (score)	$85,81 \pm 5,9$		
Fmax-Fmin (score)	78 – 99		

The average result after 6 intervention months reach 85.81 ± 5.9 scores, in which the highest score is 99 scores, the lowest score is 78 scores. This difference has the statistical meaning with ratio of very good scores 78.95% compared with ratio of good scores 21.05%, with $p < 0.05$.

3.2.4. Several factors related to length of stay and prognosis of treatment results

Table 3.36. Multivariate analysis of several factors
related to length of stay (n =115)

Research variable	OR	95%CI	Value p
High blood pressure	1,476	0,634 – 3,438	0,367
Protein decrease	1,411	0,482 – 4,133	0,530
CRP increase	3,317	1,045 – 10,531	0,042
Surgical type	4,413	1,575 – 12,366	0,005
Surgery waiting time	4,602	1,897 – 11,166	0,001

The factors related to LOS include: CRP level increases significantly, which have impacts on surgical results and surgical waiting time which are independent variables OR = 3,317, 95%CI:1,045-10,531, $p < 0,05$; Surgical type OR = 4,413, 95%CI:1,575-12,366, $p < 0,01$); Surgery waiting time, with (OR=4,602, 95%CI:1,897-11,166, $p < 0,01$).

Table 3.38. Correlative multivariate analyzing results of several prognostic
factors after 6 treatment months (n =115)

Research variable	Multivariate analysis	
	OR, (95%CI)	Value p
Age group*	3,512: 1,538 - 8,019	0,003[†]
BMD[§]	1,688: 0,728 - 8,816	0,223[†]
Blood protein decrease	2,859: 1,001 - 8,166	0,049[†]
Delirium	2,163: 1,45 - 5,98	0,001[†]

age † (60 - 69; 70 -79; 80 - 89; > 90, p < 0.05; ‡ thinner than normal and overweight; comparing between osteoporosis patients and patients with normal or decreased boney density; ‖ CRP increases much in comparision with normal, increasing lightly (≤ 10 vs > 10 μmol/L); ¶ <48 compared with ≥ 48 hours; #internal fixing and hip hemiarthroplasty.

The multivariate analysis shows that the factors related to prognosis of treatment results within 6 months, including: Age group [OR= 3,512, 95%CI:1,538-8,019, p < 0,01]; Blood protein decrease [OR= 2,859,95%CI:1,001 – 8,166, p < 0,05]; Post-operative delirium [OR=2,163,95%CI:1,450-5,980, p<0,01].

Chapter 4: DISCUSSION

4.1. Several characteristics of research object

According to research results in Table (3.1) in this study, there were 118 patients from 61 to 101 ages (the average age is 79.5 ± 9.4 ages) participating into this study. The female patients occupy 68.45% and male patients occupy 31.55%, the ratio of female/ male is 2.17/1 = 2.17; The ratio of patients aged 80 – 89 is 30.52% and patients aged ≥ 90 occupy 29.66%; The ratio of patients coming from rural areas is higher than patients living in urban areas 60.17% and 31.4%. The findings of this study are also suitable to many studies over the world and in Vietnam:

- About intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients (> 60 years of age), Willey and et al. (2018) concluded: It was the serious trauma, consequently the patient might lose motion, deform his hop joint and could suffer from shock or dead because of pain and if he was not treated timely, he could have many after-effects. The number of patients and ratio of patients over the world had the tendency of increasing highly because the expectation of life increased in many countries, especially in rural areas with underdeveloped medical system [3].

- Shyu Y and et al. (2017), thanks to statistical data from nay studies, this study showed that intertrochanteric crest fractures and/ or femoral neck fractures had impacts on about 18% female and 6% male over the world, and it might lead to death, this disease frequently happened in elderly patients with many underground diseases [92]. This result consolidates the judgment of authors in the world that the ratio of female patients is higher than male patients: Most of patients are female (68.45%) and the ratio of female/ male is 2.17. The results of this study are suitable to studies of Lehtonen EJI (2018). He collected data from US national data source among 17,122 patients, in which 70% patients were female, the ratio

of female/ male was 2.3, the average age was 80.1 ± 6.6. He had the remarks: The ratio of patients increased according to age, the ratio of patients increased according to number of underground diseases as diabetes, smoking…[4].

4.2. Clinical characteristics of elderly patients with intertrochanteric crest fractures and/ or femoral neck fractures

The results in Table (3.5) show that the difference has the statistical meaning about ratio of falling down caused by living accidents, traffic accidents and natural fractures (90.7% compared with 4.2% and 5.1%, with $p < 0.01$). The ratio of patients suffered from intertrochanteric crest fractures and/ or femoral neck fractures related to traffic accidents is very low, because the elderly people are usually at home and they rarely use traffic vehicles. The judgments of study are also suitable to studies of authors: Arhad (2021), recognized that the most cause of intertrochanteric crest fractures and/ or femoral neck fractures in the elderly people is 95% by falling down and 4.2% by traffic accident, this disease was related to osteoporosis and number of underground diseases [95]. Geor and et al. (2021) recognized that intertrochanteric crest fractures and/ or femoral neck fractures were mainly caused by living accidents at home and caused by falling down, the ratio of female elderly was higher, and traffic accidents occupied very low ratio, mainly in male, these patients lived in developing countries [96].

Most of them only do the housework and none operates actively in the economic field. In this study, the criteria of WHO (2011), WHO (2015) about biochemical and hematologic indices are used to identify the ratio of patients suffered from underground diseases. The ratio of patients suffered from underground diseases is very high 96.61%, results in Table (3.2), the ratio of patients with diabetes is 40.67%; Degenerative arthritis 55.08%, digestive diseases 65.25%, respiratory diseases 43.22%. Table (3.3) shows that these results are suitable to many studies in the world, as: Nakanishi K (2018).

4.3. Treatment results of elderly patients with intertrochanteric crest fractures and/ or femoral neck fractures

The ratio of unequal extremities < 1 cm is very high 97.26%, only 1/73 (2.74%) unequal extremities from (1-2) cm. On X-ray film, the neutral kinds occupy 98.63% (72/73) about normal physiological surgery. In Table 3.24, the ratio of dead patients after 6 intervention months is 3.94% (3/76), the ratio of patients with incision infection is 2.63% (2/76) Table (3.17); The results in Table (3.23) show that the patients with total active motion from 211º - 300º (reaching 5 points) increase from 73.69% after 1 month and it

increases to 95.90% after 6 months, this difference has the statistical meaning, with $p < 0.05$. In Table 3.24, the results collected according to Harris scale, the patients at very good level occupy 89.04%. These results confirm the results of hip joint replacing techniques used by this study are very good, suitable to conditions of Nghe An Hospital for Traumatology and Orthopaedics which is still lack of equipment and human resources. Our results shows that the hip hemiarthroplasty and preservation treatment also have very good results, few complications in and after surgery, the recovering time of patients is short. These results are suitable to many studies in the world, as: Grosso MJ (2017), Retrospective study was conducted for 686 elderly patients treated intertrochanteric crest fractures and/ or femoral neck fractures in several hospitals in Japan, its results showed that the ratio of success was high, only 1.4% patients were re-operated in the group of patients > 75 years of age [46]. Hernandez NM and et al. (2018), study on total narrow hip joint after improving the situation of minimal inclined bone neck fracture in elderly patients, results were: 1 patient was re-operated after 11 years, 1 patient was suffered from acute blood periprosthetic joint infection, 2 patients was undergone acute re-operation, the survival ratio was 97% after 5 years, Harris hip scores were improved from $35 – 85$ ($p < 0.01$) [60]. The studies of authors inside and outside country, as: Duong Dinh Toan and et al. (2019), very good level 82.0%, good level 12.0%, average and poor level 6.0%. He concluded that the hip hemiarthroplasty for elderly patients with intertrochanteric crest fractures is good solution [14]. The elderly patients suffered from Covid-19 and intertrochanteric crest fractures and/ or femoral neck fractures will increase the dealth risk. According to study of LeanneDupley and et al. (2021), the elderly patients suffered from Covid-19 and intertrochanteric crest fractures and/ or femoral neck fractures had the death ratio within 30 days 32.8% (21/64), the ratio of female dead patients was 55%, the highest ratio of dead patients was the group of patients suffered from myocardial infarction previously, the general ratio of death increased to 50% after 45 operating days [29].

4.2.4. Treatment results by internal fixing

For 39 patients treated by internal fixing, from $3 – 6$ months, 1 patient is dead, the results at ratio of unequal extremities < 1 cm after 6 intervention months is 97.37%, 97.37% radiographing results are at the neutral level. According to Table 3.26, the ratio of dead patients after 6 months is 2.56% (1/39). According to Harris scale, after 6 intervention months, there are 78.95% patients reaching very good level, 21.05% patients reaching good level, no

patient reaching average and poor levels. The results stated above show that the results of internal fixing are very good, equivalent to hip hemiarthroplasty and the selection of intervention techniques applied for patients are suitable and the most optimal, which reflects the skills of medical staff with many progresses for provincial specialized hospital. The results of this study are also suitable to many studies in the world and in Vietnam: Korkmaz MF (2014) researched 100 patients with intertrochanteric crest fractures and/ or femoral neck fractures in the elderly, the average age was 77.66, the ratio of female/ male was 2.2/1, 73 people was treated by nailing technique, 27 people were treated by bone head nailing in comparison with internal fixing and bone transplanting. After 12 – 75 supervising months, the results were 78% patients with X-ray films on normal surgical positions, Harris hip scores were contrary to patients' ages, 3 patients were dead because of not good medical caring conditions. Thanks to these results, he concluded that early bone head nailing was the reliable technique and few complications [23]. Beside the most dangerous complications for patients as death, the popular disadvantageous complication is avascular necrosis which occupies a significant ratio. The study of Jong Ho Noh (2020), the patients suffered from intertrochanteric crest fractures and/ or femoral neck fractures were treated by screws. He used the imaging technique to identify "nail line signs" for taking photographs of needle eyes 99mTc-HDP for estimating the risks of avascular necrosis, consequently, the risks of avascular necrosis were bigger when the dimensions of needle eyes are bigger [114].

4.2.5. Several factors related to length of stay

The length of stay depends on waiting time for surgery, the post-operative time until the patients is discharged from hospital. Consequently, CRP level increases significantly, the relation between CRP and LOS levels can be estimated, but they are rarely reported in medical documents. High increase of CRP relates to high tissue damage level [117] and increase of post-trauma complication risks [118]. Our result on estimation factor of CRP increase depending on patient's condition is suitable to study of Fakler [118]. High increase of CRP relates to higher ratio of bone loss [116] related to hip fractures of elderly patients who frequently reduce the calcium density, bone density and increasing CRP because of potential infection [119]. The average surgical time after being hospitalized in our study (52.1 hours) is longer than findings in other countries as Taiwan (29.2 hours) [105], Sweden (on average, 20 hours) [106]. Although the optimal time of WTS has not been identified, waiting for more than 48 hours since hospitalized until operating is considered as "slow" and related to worse

results of patients [107]. The average LOS of patient operated among out patients (15 days) is higher than reports of several other countries (fluctuating from 6.5 to 11.6 days) [108]. These results show that we need have necessary methods to shorten WTS and LOS to reduce the death risks and medical caring costs of patients suffered from intertrochanteric crest fractures and/ or femoral neck fractures in Vietnam [93]. According to Table 3.36, when analyzing correlatively, Pearson identified the strong correlation, such as: CRP increase (OR = 3,217, 95%CI: 1,517 - 12,336, p < 0,05) and waiting time for surgery due to underground disease treatment (OR = 4,602, 95%CI 1,897 -11,166, p < 0,01) and kind of surgery OR = 4,413, 95%CI:1,575-12,366, p < 0,01. The findings of this study also consolidate the judgment of studies in the world about factors: Old age, osteoporosis degree, potential infection situation (CRP increase) and blood protein decrease, albumin decrease... which play an important role in lengthening LOS because the waiting time for surgery, post-operative recovering time are lengthened.

4.2.5. Factors related to results after 6 treatment months

Thanks to multivariate analysis of factors related to death estimation after 6 months, the factors: age group with value (OR = 3.512, 95% CI: 1.538 – 8.019, p < 0.01); Blood protein decrease (OR = 2,859, 95%CI:1,001 – 8,166, p < 0,05), relate significantly to treatment results. Our results and judgments are totally suitable to studies: In Vietnam and South East Asia, because the aging population increases fast, the number of patients with intertrochanteric crest fractures and/ or femoral neck fractures is estimated to increase. Vietnamese patients have the demographic or clinical characteristics different from patients with intertrochanteric crest fractures and/ or femoral neck fractures in developed countries. Therefore, the factors related to death ratio or functions of patients with hip joint fractures maybe different form patients in developed countries. For these reasons, data from Vietnam are very useful for clinical intervention and also understanding more about science, the associated factors include: Age, nutrition situation, physical condition (BMI), osteoporosis [100], [120].

CONCLUSION

Among 118 patients suffered from intertrochanteric crest fractures and/ or femoral neck fractures, 115 patients are treated, the findings are:

1. The ratio of female patients is 31.4%, the ratio of female/ male is 2.17; the ratio of patients with intertrochanteric crest fractures and/ or femoral neck fractures caused by falling down is 90.7%. Garden IV fractures occupy 72.0%, Garden III 18.0%, 100.0% patients have pain; Hip joint deformation (68.64%); Extremity motion deduction, loss (72.0%); Ratio of patients suffered from general underground diseases (96.61%). Average T-score – 2.0 ± 1.3, in which T-score from < 2.5 (osteopososis) occupying (45.77%). The ratio of patients treated by hip hemiarthroplasty is 66.08%, ratio of patients treated by internal fixing is 33.91%.

2. Treatment results of intertrochanteric crest fractures and/ or femoral neck fractures in elderly patients in Nghe An Hospital for Traumatology and Orthopaedics: For patients treated by hip hemiarthroplasty: Ratio of early dead patients after 1 and 3 months is 0.0%, after 6 months it is 3.94% (3/76); The ratio of patients with unequal extremities < 1 cm, occupying 97.50%; According to Harris scale, the results are very good (90 – 100) scores, occupying 89.04%, very good (80 – 89) scores 9.58%, only 1/76 (1.37%) for average type. For patients treated by internal fixing: the ratio of patients with unequal extremities < 1cm after 6 treatment months is 94.87%; According to Harris scale, very good (90 – 100) scores occupying 78.95%, good (80 – 89) scores, occupying 21.05%. The factors related to length of stay: CRP increases significantly OR = 3,317, 95%CI:1,045 -10,531, p < 0,05; Kind of surgery OR = 4,413, 95%CI:1,575 -12,366, p < 0,01; Waiting time for surgery OR = 4,602, 95%CI:1,897 -11,166, p < 0,01. The factors related to death prognosis after 6 treatment months include: Age group (OR = 3,512, 95%CI (1,538 – 8,019), p < 0,01; Blood protein decrease (OR = 2,859, 95%CI (1,001 – 8,166), p < 0,05; Post-operative delirium (OR= 2,163, 95%CI:1,450 – 5,980, p < 0,01).

PETITION

Thanks to findings of this study, we have the petitions, as follows: the elderly people should examine health in period, measure the osteoporosis degree to prevent from intertrochanteric crest fractures and/ or femoral neck fractures. They should be hospitalized soon, intervened soon by hip hemiarthroplasty; the elderly patients with complex fractures should be treated by internal fixing. They should be treated their underground diseases to prevent from intertrochanteric crest fractures and/ or femoral neck fractures.