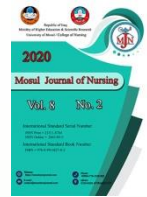




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Assessment of internal fixation outcomes among fractured patient in Mosul City

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ABSTRACT

Background and Aim: Internal fixation is a surgical intervention in orthopedics that involves the surgical implementation of doing a managements and repairing for bone, this concept starting in the mid of 19th century and was made a doable as routine surgical treatment in the mid of 20th century, that operation may be made by special equipment like stainless steel or titanium, the study assessed outcome of internal fixation.

Material and method: cross-sectional (descriptive) design, 110 patients were participate in this study which conducted at Al – Salam Hospital Teaching and Al-Jumhory Teaching Hospital from 10th December 2013 to 7th April 2014, The study tool composed of three parts; part one demographic characteristics of the patients including age, gender, residence, past history (family history, medical history) and economic status, Part Two; Fractures classification consist of five items; types of fractures location of fracture mechanism of trauma, duration of internal fixation and Part Three (Internal fixation outcome) consist of three items (complete healing without complication, failure of internal fixation, delayed definitive fixation).

Results: 80.9 of patients was suffering from complete fracture, Femur was the most commonly location of fracture which constitute 56.3% of patients, the majority of fractures were caused by blunt and motor vehicle collisions constitute 40.9% and 31.8% respectively. More than half of the patients were achieved internal fixation without complications while 43.8% of patients were suffered from joint stiffness more than one month post-operatively.

Conclusion: rigged internal fixation lead to good healing therefore more than half of patients was completely healing with variation in time, while failure of internal fixation was about quarter of study sample caused by complication.

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Recommendation: Encourage to use internal fixation procedure less than 30 days after fractures and applying internal fixation for more than one year to avoid nonunion complication.

Keyword : Internal fixation , Outcome , Assessment , Fracture .

INTRODUCTION

Background: is a break in the continuity of the bone. A bone fracture can be the result of high force impact or stress, or trivial injury as a result of certain disease conditions which are led to weaken the bones, such as osteoporosis and bone cancer, or osteogenesis imperfecta, where the fracture is then properly termed a pathologic (Marshall and Browner, 2012).

There are many types of fractures, but the main categories are displaced, non-displaced, open, and closed. Displaced and non-displaced fractures refer to the way the bone breaks.

Operative treatment of the fracture is challenging due to both the complex shape of the bone and the limited soft tissue available, there is evidence that surgically treated patients heal faster and return more quality to their previous activities than those with a conservatively treated fracture (Sterens, et al 2001).

Internal fixation is an operation in orthopedics that involves the surgical intervention of implants for repairing a bone, this concept starting in the mid of 19th century and was made a doable as routine surgical treatment in the mid of 20th century, internal fixator may be made of stainless steel or titanium (Schlich, 2002).

Types of internal fixators include bone screws and metal plates, pins, rods, Kirschner wires and intramedullary devices for example the Kuntscher nails and inter locking nail (Medicine Net, 2010).

Risk of fracture depends, in part, on your age. Broken bones are very

common in childhood, though children's fractures are generally less complicated than fractures in adults. As you age, your bones become more brittle and you are more likely to suffer fractures from falls that would not occur when you were young (Whittle, 2008).

The goal of treatment in open fractures is to prevent infection, promote fracture healing and restore normal limb alignment and function. Complications are rare, but no procedure is

completely free of risk. If you are planning to have this procedure, your doctor will review a list of possible complications, which may include Infection, Bleeding, Reaction to anesthesia and Blood clots (Song, et al 2008).

Complications of internal fixation include pin tract infection, pin loosening or breakage, interference with joint motion, neurovascular damage when pins are placed, malalignment caused by poor placement of the fixator, delayed union, and malunion (Dorothy and Liddel, 2010).

Rationale of the study:

1. There were (10%) of patient with major complications and (18%) of patients with minor complications, There were (6.7%) with both major and minor complications (Widjaja, et al 2007).

2. Negative outcomes in many patients lead to internal fixation failure, about (25%) of patients after internal fixation sustained a failure of fixation (Mendelsohn, et al 2013).

3. Relating to bad security situation and low safety level in our country the accidents has significantly increased so there is need to study about this.

Aim: to assess outcome of internal fixation.

Objective of the study:

1. To assess socio demographic data of the study stander
2. To identify causes and associated sign of fracture among study simple.
3. To classify the outcome of internal fixation among fracture patient.

Term definitions:

Assessment: Is a gathering and analyzing information that will affect the health of the people to be served (Judith and Babara, 2005).

Internal fixation: surgical itervention is doing to repairing bone, an internal fixator may be made of stainless steel or titanium (Sterens, et al 2001).

Outcomes: study of the results of health services experiences, the result of an experiment in probability theory. <http://en.wikipedia.org/wiki/Outcomes>.

MATERIALS AND METHOD

Ethical considerations

Administrative arrangement

Prior to collection of data, official permission was obtain from the University of Mosul/ Nursing College/ Research committee. (Appendix A)

Consent form to the sample

Ethical issue was obtain from all patients and only who are agree to participate in the study were chosen. (Appendix B)

Design of the study

To achieve study aim (objectives) non-experimental (cross-sectional) descriptive design was applied.

Period of the study and data collection

The study was conducted from 10th December 2013 to 7th April 2014.

Working plan has been setup in order to execute the research work. The progress steps explaining in the details of this work include the following steps:

a- The submission of the questioner to include patient and interviews with these patients has been executed and then the collected questioners and then

analyzed and transmitted in to a computer data program prepared for this mission (one month).

b- The collected data after analyzing is fed in an excel special computer processing data analyzer and the results were drawn and a required table as well (one month)

Study Setting

This study was conducted at Al – Salam Hospital Teaching and Al- Jumhory Teaching Hospital in Mosul city.

Sample and sampling of the study

Non-probability simple random (Convenience) sampling technique was used in this study; (110) patients was selected from fracture department and emergency department in mentioned hospitals, Sample size calculation was done through power analysis.

The study tool

Researchers and supervisor built the study tool, expert was asked for their opinions, all modification by expert was done. The study tool composed of three parts:

Part One: cover demographic characteristics of the patients including age, gender, residence, past history (family history, medical history) and economic status.

Part Two: Fractures classification; include five items(types of fractures include: complete, incomplete, simple, comminuted),location of fracture include (redus , ankle, clavicle ,femur , humerus, patella , spine ,tibia, ulna), mechanism of trauma include (penetrating , blunt ,motor vehicle collisions, sporting activities and other mechanism) and duration of internal fixation ranging from less than 6 months to one year.

Part Three: Internal fixation outcome; include three items (complete healing without complication, failure of internal fixation, delayed definitive fixation), complications include 9 items (Nonunion, DVT, joint stiffness, limping, bed ulcer, osteoporosis, keloid

scar, muscle wasting and infection). (Appendix C).

Validity

To ensure the validity of the tool, (10) experts was chosen to evaluate the proposed plan of the study tool, their opinions, suggestions and recommendations were depended to adapt and direct the study plan. (Appendix D).

Reliability

Cronbach's alpha coefficient was used to test the reliability of the questionnaire dimensions. Reliability of the study tools was determined by split half = 0.76.

Data analysis:

Data are prepared and entered into a computer files; Statistical Program for the Social Science (SPSS, version 21) was used to analysis of data results. Data are analyzed through the application of descriptive data analysis approach (Frequencies and Percentages).

Barriers of the study:

Difficulty in collecting ethical consent from health office.

1. Difficulty in collecting information from patients because they are tired.
2. Unavailability of national previous studies similar to this study.

RESULTS

Table (1) Demographical elements of the Study participants.

<i>Variables</i>		<i>No.</i>	<i>%</i>
Age	Less than 15 years	13	11.8
	15-29 Years	41	37.3
	30-44 Years	26	23.6
	45-59 Years	17	15.5
	More than 60 Years	13	11.8
Total		110	100
Gender	Male	67	60.9
	Female	43	39.1
Total		110	100
residence	Rural	56	50.9
	Urban	54	49.1
Total		110	100
Past History	No Past History	96	87.3
	Medical History	3	2.7
	Surgical History	11	10
Total		110	100
Economic Status	Good	3	2.7
	Moderate	57	51.8
	Poor	50	45.5
Total		110	100

Table (2) Distribution of the fractures classification.

Items		No.	%
Type of the Fracture	Complete	89	80.9
	Incomplete	4	3.6
	Simple	2	1.8
	Comminuted	15	13.7
Total		110	100

	Radial	13	11.8
	Ankle	7	6.4
	Clavicle	1	0.9
Location of Fracture	Femur	62	56.3
	Hummers	17	15.5
	Patella	4	3.6
	Tibia	2	1.8
	Ulnar	4	3.6
	Total	110	100
		Penetrating	12
Causes of Fracture	Blunt	45	40.9
	motor vehicle collisions	35	31.8
	sporting activities	8	7.3
	other mechanisms	9	8.2
Total		110	100
Duration of Fracture	Less than 10 days	34	30.9
	10-19 days	26	23.6
	20-29 days	8	7.2
	More than 30 days	42	38.3
Total		110	100
Duration of internal fixation	Less than 6 months	57	51.9
	6- less than 12 months	32	29.1
	12- less than 18 months	13	11.8
	18-24 months	8	7.2
Total		110	100

Table (3) Distribution of outcomes and complications of the fractures.

	<i>Items</i>	<i>No.</i>	<i>%</i>
Outcomes	complete healing	65	59.1
	failure of internal fixation	27	24.5
	delayed definitive fixation	17	15.5
Total		110	100
Complication of Fracture	Nonunion	7	6.3
	Deep vein thrombosis (DVT)	3	2.7
	Joint stiffness	48	43.8
	Limping	2	1.8
	Bed ulcer	5	4.5
	Osteoporosis	7	6.3
	Keloid Scar	10	9.1
	Muscle wasting	16	14.6
	Infection	12	10.9
Total		110	100

DISCUSSION

The study shows that 37.3% of total patients was aging from (15-29) years old, this result similar to the study of (Beekap et al, 2010) who found that 60% of study sample was aged from (16-25) years old. While different from the result of (Felix, 2012) which report that 49.4% of the patients was aged

from (21-30) years old. In this study males (66.9%) are more likely to managed with internal fixation than females (39.1%), different study by (Beekap et al, 2010) who conducted that 88% of study sample were male., also different from study by (Mian et la, 2004) who conducted that (94.12%) and female were 4 (5.88%).

Concerning to type of fractures; the majority of the sample has complete fracture constituting 80.9% followed by 13.7% comminuted fracture, similar study by (Felix, 2012) who present that the classification of fractures was incomplete, complete and comminuted type were encountered in 27.5%, 38.5% and 15.4% respectively, also similar to study by (Beekap et al, 2010) who found that the majority of patients 40% was suffer from comminuted fracture.

In the study femur fracture was the highest location for fractures which constituted 56.3% followed by hummers 15.5% and 11.8% radial while 1.8% for tibia and 3.6% for ulna and patella, this study supported by (Beekap et al, 2010) who found that 3.3% of fractures was patella and 6.6% for both tibia and fibula fractures. Relating to security situation in Iraq (accidents of explosions and gunfire) the most causes for fractures in this study were blunt injuries (40.9%) followed by motor vehicle collisions (31.9%) this result similar to study by (Mian et la, 2004) who revealed that fracture has high velocity from gunshot injury. Also similar to study by (Daniel, et al 2008) that revealed that the majority of injuries mechanisms was blunt which constituted 68% of study sample. The result conducted that the duration of fractures was 38.3% more than 30 days while 30.9% for less than 10 days, this result not supported by (Beekap et al, 2010) who present 70% of study fractures was duration form 10-20 days and 13.3% of fractures' duration were more than 30 days.

The study shows that 43.8% of fractures' complications was joint stiffness, 6.3% nonunion, 10.9% infection and 1.8% limping, this result similar to the study by (Mian et la, 2004) who found that complication of interlocking was 10.3% for infection, 2.9% for limb shortening, 5.8% for nonunion and 7.3% for knee stiffness.

While different from study by (Beekap et al, 2010) who found that the postoperatively complication followed interlocking nailing was 16.6% for superficial infection, 33.3% for restriction of knee flexion and 6.6% for delayed union with no evidence of nonunion and mal-union.

Of all patients 59.1% they were completely healing while 15.5% has delayed healing and 24.5% failed in healing, this result not supported by (Mian et la, 2004) who found 4.4% failure of interlocking were recorded.

CONCLUSION

The majority of patients was suffering from complete fractures; femoral bone was the most comment of internal fixation followed by hummers.

Blunt injuries and motor vehicle accidents was the most common causes for fractures among study sample, rigged internal fixation lead to good healing therefore more than half of patients was completely healing with variation in time, while failure of internal fixation was about quarter of study sample caused by complication.

A half of sample after internal fixation was complicated as Joint stiffness, while the less complication was the limping.

RECOMMENDATIONS

1. Encourage to use internal fixation procedure less than 30 days after fractures and applying internal fixation for more than one year to avoid nonunion complication.
2. Advice patients about the benefit of exercises (flexion and extension) that can decrease the joint stiffness.
3. Observation of ready back drainage and change of dressing to decrease infection, elevate lower extremity to avoid edema and thrombosis after fixation.

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