

Prevalence of Hip and Knee Injuries Combined with Ipsilateral Femoral Shaft Fractures, Shahid Beheshti Hospital, Babol

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Abstract: Femur fractures vary greatly, depending on the force that causes the break. Patients with a femoral shaft fracture typically experience a sudden onset of sharp, intense thigh pain at the time of injury. The aim of this study was to evaluate the hip and knee injuries with femoral shaft fracture. In this cross sectional study, eighty one patients were assessed. Demographic information including fracture of the femur, hip and knee injuries with clinical examination and radiology at the time of entry, before and after surgery was evaluated by the orthopedic surgeon. The mean age of study population was 28.86 years. The etiology of fractures was as follow: 18.5% of the fractures with car accidents, 16% of the fractures with pedestrians and 4.9% of them with falling and stumble. In addition to dislocation of the hip joint or knee, from 81 patients hospitalized, 50 patients (61.7%) had fractures in the middle third of femur shaft, 22 patients (27.2%) had fracture in distal third and 9 patients (11.1%) had fracture in proximal third. Thirteen patients (16.4%) suffered from femur fracture. Twenty patients of the 81 patients (24.69%) had knee ligamentous damage with femur fractures. Present work demonstrates simultaneous knee and hip injuries with femur fractures have high prevalence. Early diagnosis and clinical examination may lead to decrease in symptoms such as joints instability, reduction in range of motion, hip and knee's secondary damage.

Key words: Femoral Shaft Fracture • Hip Injury • Knee Injury

INTRODUCTION

Femoral shaft fracture occurs due to extraordinary force which causes thighbonebreaking; transmit to the end of the thighbones that can cause some damages to the hip and knees.

Multiple trauma patients with thigh fracture and knee ligament latent injury is a diagnostic challenge. Knee ligament injury with fractures of the femur can seriously affect the scientific outcome of treatment.

In a survey conducted on 59 patients with femoral shaft fractures, Dickob, and Mommsen [1] have surgically treated patients in which 18.6% of them had knee ligament injuries. In these cases one or both cruciate ligaments were damaged. Multiple trauma patients were sited on the front seat of the car had the most injuries (30.8%). As 61.6% of ligament injuries diagnoses primarily, knee joint stability examination is essential after thigh fracture is proved. It has been reported that ligament rupture is curable via surgery [2]. In another investigation, the

incidence of serious ligament injuries of knee with femoral shaft fractures has been reported from 5 to 52% [3]. Knee ligament injuries in fractures of the femur and tibia of that side are more common than of the fracture of thigh.

Szalay *et al.* [4] have conducted survey on 114 patients with thigh fractures which have occurred 3-9 years before, knee joint loosening have seen in 27% of patients. It should be noted that only 11% of these patients complained about instability of their knees. Most patients with knee ligament damage had ruptured anterior cruciate ligament with or without other ligament injuries. In 33 patients with 34 fractures, this issue existed but only 18 patients complained about instability [2-4]. Kaseb *et al.* [5] have studied in capital city of Tehran the incidence of knee ligament injuries with fractures of the femur reported as the follows: 6% ACL tearing, 3% PCL, 14% MCL and 8% LCL. Knee ligament injuries in distal femur fractures are more [5-18].

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Based on the above investigations, it can be concluded that knee exact checking is essential in all patients with thigh fracture. For diagnosing this issue, Walker and Kennedy [6] have examined joint aspiration; under anesthesia arthroscopic examination has been recommended [6]. Undisplaced femoral neck fracture with femoral shaft fractures has been reported in literatures [7-8]. Delayed diagnosis of undisplaced femoral neck fracture with femoral shaft fractures have also been frequently reported in many research articles [9].

Tay and Tong [11] have studied on 14 patients who had unilateral fracture of the femur and tibia; they have seen more femoral and tibia fracture patterns and fractures of femoral and tibia condyle [10].

In an investigation defined by Tay and Tong [11], intertrochanteric fracture with femoral shaft fractures may occur in 28% of cases, which is not usually segmented [11]. Dislocation of hip joint with femoral shaft fractures happens rarely and occurs due to severe trauma. Early diagnosis and reduction have suitable scientific results. The surgeon should think about this common injury. Radiological examination of all patients with femoral fractures, especially in cases where the patient is unconscious and injured limb swelling covers clinical symptoms, are routinely required [12].

The mentioned injuries in hip and knee along with femoral shaft fracture are important due to the following aspects: the possibility of failure in recognition in the case of insufficient clinical examination and radiography before and after the surgery. Another issue is that failure in recognition in these injuries may cause serious side effects that implicate the patient complaints and legal troubles. When the surgeons have sufficient information about hip and knee injuries rate with femoral shaft fracture, the awareness and accuracy will increase as they face to patients with fractures and diagnosing and the result of these injuries become desired. Hence, this study aimed to investigate the prevalence of hip and knee injuries with femoral shaft fracture.

MATERIALS AND METHODS

This prospective cross-sectional study was performed. The population of this study consists of the ones who hospitalized for period of one year (March 2014 to 2015) in Shahid Beheshti hospital, Babol, Iran due to fracture of the femur. All patients participated in this study willingly, consciously and thorough full explanations and by taking their consent form.

Demographic information of the patient such as age and gender, along with other data, including trauma cause, the patient, fracture of the femur and hip and knee injuries with clinical examination and radiological knee, femur and hip fractures were collected at the time of entry, before surgery and clinical examination. The radiological knee, hip fractures at the time of entry and before surgery and also physical examination such as knee MRI were performed. In order to evaluate the ligaments injuries in patient who seems to have such injuries all necessary examinations were obtained. Patients were under observation after surgery for possible diagnosed and undiagnosed lesions.

All obtained demographic data from clinical and preclinical registered in a questionnaire coherently and listed and analyzed in SPSS, 20 version; the software was developed by IBM Company.

RESULTS

During one-year investigation (March 2014 to March 2015), 81 cases of femoral fracture were hospitalized in Shahid Beheshti hospital, Babol, Iran. 72 of this population were male (88.9%) and 9 females (11.1%). The mean age of this population was 28.86 years (ranged in 9 to 79 years). Table 1 shows patient gender distribution.

The cause of trauma which leads to femoral fractures in the most cases trauma are related to motorcyclists accidents. Table 2 shows frequency of trauma type incidents. The fractures and injuries causes are as the following: 18.5% car accidents, 16% pedestrians, 4.9% falling and stumble. In general, 95.1% of cases of the femur fracture were related to accidents (Table 2).

Fracture with 44.4% in right femur and 51.9% in left femur with the frequency of 3.7% in both femur were not much different. From 81 patients who were taken to the hospital, 50 person (61.7%) had fractures in the middle third or femur shaft, 22 person (27.2%) in one-third of distal and 9 person (11.1%) in one-third of proximal (Table 2). In 10 person (12.3%) was injured in hip joint or proximal femur. None of the patients had any dislocation in the hip joint. 9 patients suffered from tibia fractures, 5 person tibial shaft fractures, 3 person tibial distal fractures, 1 person tibial plateau fracture, and 2 person fibula shaft fractures (Tables 4-9).

The obtained results showed that knee ligaments injuries in 20 patients in which the most damage related to MCL has the frequency of 8 people (9.9%). PCL with the

Table 1: Patient gender distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	72	88.9	88.9	88.9
	Female	9	11.1	11.1	100.0
	Total	81	100.0	100.0	

Table 2: Frequency and percentage of trumamechanism

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Motorcycle	49	60.5	60.5	60.5
	Car accident	15	18.5	18.5	79.0
	Passenger	13	16.0	16.0	95.1
	Falling down	4	4.9	4.9	100.0
	Total	81	100.0	100.0	

Table 3: Frequency and percentage of truma side

		Fxlocation			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	4	4.9	4.9	4.9
	1/3proximal	9	11.1	11.1	16.0
	1/3middel	47	58.0	58.0	74.1
	1/3distal	21	25.9	25.9	100.0
	Total	81	100.0	100.0	
	Right	36	44.4	44.4	44.4
	Left	42	51.9	51.9	96.3
	Both	3	3.7	3.7	100.0
	Total	81	100.0	100.0	

Table 4: Frequency and percentage of trumalocation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	4	4.9	4.9	4.9
	1/3 Proximal	9	11.1	11.1	16.0
	1/3 Middle	47	58.0	58.0	74.1
	1/3 Distal	21	25.9	25.9	100.0
	Total	81	100.0	100.0	

Table 5: Frequency and percentage of hip and proximal femoral fracture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	71	87.7	87.7	87.7
	Neck	1	1.2	1.2	88.9
	Inter-trochanter	3	3.7	3.7	92.6
	Sub-trochanter	4	4.9	4.9	97.5
	Acetabulum	2	2.5	2.5	100.0
	Total	81	100.0	100.0	

Table 6: Frequency and percentage of femoral condyle fracture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	78	96.3	96.3	96.3
	Lateral	2	2.5	2.5	98.8
	Bicondylar	1	1.2	1.2	100.0
	Total	81	100.0	100.0	

Table 7: Frequency and percentage of tibial fracture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	72	88.9	88.9	88.9
	Shaft	5	6.2	6.2	95.1
	Plateue	1	1.2	1.2	96.3
	Distal	3	3.7	3.7	100.0
Total		81	100.0	100.0	

Table 8: Frequency and percentage of fibula fracture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	79	97.5	97.5	97.5
	Shaft	2	2.5	2.5	100.0
Total		81	100.0	100.0	

Table 9: Frequency and percentage of patella fracture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	78	96.3	96.3	96.3
	Suppole	1	1.2	1.2	97.5
	Lat-border	1	1.2	1.2	98.8
	Stellate	1	1.2	1.2	100.0
Total		81	100.0	100.0	

Table 10: Frequency and percentage of knee ligament injures

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	61	75.3	75.3	75.3
	ACL	3	3.7	3.7	79.0
	MCL	8	9.9	9.9	88.9
	PCL	6	7.4	7.4	96.3
	LCL	3	3.7	3.7	100.0
Total		81	100.0	100.0	

Table 11: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
age	81	9.00	79.00	28.8642	15.42786
Valid N (leastwise)	81				

Table 12: Relation of femoral site fracture and knee ligament injures

		Knee ligament injury					
		.00	ACL	MCL	PCL	LCL	Total
Fx location	.00	4	0	0	0	0	4
	1/3 Proximal	9	0	0	0	0	9
	1/3 Middle	32	2	6	5	2	47
	1/3 Distal	16	1	2	1	1	21
Total		61	3	8	6	3	81

Table 13: Relation of tibial site fracture and knee ligament injures

		Knee ligament injury					
		.00	ACL	MCL	PCL	LCL	Total
Tibialfx	.00	57	3	6	4	2	72
	Shaft	2	0	1	2	0	5
	Plateue	0	0	0	0	1	1
	Distal	2	0	1	0	0	3
Total		61	3	8	6	3	81

frequency of injury in 6 patients (7.4%) was in second place. Each ACL and LCL ligament with damages in 3 patients had a frequency equally and minimum. 20 people of the 81 patients (24.69%) had ligamentous damage in knee in addition to femur fractures. In general 32 people of 81 patients had injuries in knee and hip (Tables 10-13).

DISCUSSION

Fractures of the femur are the most common fractures of the long bones. The results of our study showed the highest rates of the femur fracture are due to the car accidents. Among these accidents, motorcycle accidents have a great percentage. In a study conducted in England, among all fractures caused by motorcycle accidents 81.1% of them related to femur, hip and knee fractures [13]. The male to female ratio in this study was equal to 8 which can be due to the incidence of the accidents in men other than women.

According to Roudsari *et al.* [14], car and motorcycle accidents are the cause of 70% of fractures in Iran and other studies [15] showed that fractures of the femur in young ages mostly happen due to the accidents. High prevalence of these fractures in traumas due to the accidents showed that we need more attention and sufficient actions in the community levels.

In this study, the highest rate of femoral shaft fracture relates to middle one-third of the diaphysis which is correspondence to other studies found in literature [16, 17]. Other studies showed that the prevalence of fractures of the proximal femur and shaft is 6% but our study accounted a greater percentage (12.3%) [18]. That could be due to the small statistical population of the study or the great injuries which occurred to patients. The simultaneous fracture of tibia have seen only in 11% of patients in which the fracture was often in tibia shaft so in femur shaft fractures should pay more attention to the simultaneous fracture its distal or proximal parts. Evaluation showed knee joints ligament injuries in 25% of patients which is the highest prevalence was found in MCL and PCL.

Regarding to Kaseb *et al.* [18] and present finding in fractures of the femur the MCL is often tear. In addition, ACL rupture has the lowest frequency among other ligament.

Based on the obtained results of this study, simultaneous Knee and hip injuries along with femoral fractures have the high prevalence. By early diagnosis and clinical examination symptoms such as joints

instability, loss of motion, hip and knee secondary damages should decrease. Due to the low statistical population and need for further studies in this field conducting an extensive study to offer further evidence which relates this study is suggested.

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