

Functional Outcome in Isolated Hoffa Fractures

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Abstract

Background: The aim of this study was to assess the functional outcomes of open reduction and internal fixation of isolated Hoffa fractures.

Materials and Methods: This was a prospective study comprising 24 patients from December 2018 to January 2021 at Murshidabad Medical College and Hospital with isolated Hoffa fractures in 20 males and 4 females., in 18 cases only fixation with screw was used and in 6 cases both screw and plates were used. In 17 cases screw was given in anteroposterior direction and in 7 cases posteroanterior screw was given.

Results: The minimum follow-up period 9 months. None of the patients in our series was treated conservatively. The mean ROM was 102.7 degree, KSS rating was 83.92 and functional rating was 80.63 at the final follow-up. At 12 months of follow up 16 cases(66.7%) had excellent functional rating 4 cases (16.7%) had good functional rating 3 cases (12.5) had fair functional rating and 1 case (4.2%)had poor functional rating.

Conclusions: Operative management seems to be a good treatment option isolated Hoffa fractures, All parameters of knee society score showed less morbidity and better functional outcome.

Keywords: Hoffa fracture, Knee society score, Functional rating, Operative management

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Introduction

Hoffa fractures are Intraarticular, unicondylar fractures of the distal end of the femur occurring in the coronal plane. It was first reported by Hoffa in 1904. They are uncommon injuries and most often affect the lateral condyle [1]. The injury can be easily overlooked with conventional radiographic imaging specially if undisplaced or associated with

supracondylar – intercondylar distal femur fracture. computed tomography (CT) has thus been recommended to improve the diagnostic yield [2]. Non operative treatment of Hoffa fractures was reportedly associated with secondary displacement and poor functional results. Operative treatment with anatomical reduction, rigid internal fixation and early

rehabilitation protocols has been advocated [2,3,4,5].

In this study we are assessing the functional outcome of open reduction and internal fixation of the isolated Hoffa fracture and the advantages and disadvantages of open reduction and internal fixation of isolated Hoffa fracture with the complications of this modality.

Materials and Methods

24 patients with isolated Hoffa fractures were included in this series with 20 males and 4 females who had been treated with ORIF between December 2018 and January 2021 at Murshidabad Medical College and Hospital in the Department of Orthopedic Surgery with an minimum follow up 9 months. Open fractures were excluded from this study.

For all patients, standard pre-op assessment were x-rays (AP and lateral) and CT scan with 3D reconstruction views. Fractures were classified according to the Letenneur classification [6].

All patients were operated Under spinal anesthesia in supine position with a sterile rolled-up sheet was placed under the supracondylar region of the distal femur to keep the knee flexed at about 30 degree which helped to relax the gastrocnemius, medial parapatellar, lateral parapatellar or anterolateral approach as per fracture requirement. After careful reduction main fragments were fixed using Herbert screws or 3.5mm reconstruction plate or both according to fracture configuration and finally checked with an image intensifier. Once fixation is achieved properly, the wound is closed in layers over a drain. Soft dressing is applied.

Unless there are other injuries, or complications, joint mobilization was started immediately postoperatively. Both active and passive motion of the knee and hip can be initiated immediately postoperatively. Emphasis was placed on quadriceps strengthening and straight leg

raises. Static cycling without load, as well as firm passive range of motion exercises of the knee, allow the patient to regain optimal range of motion. No weight bearing was allowed for six to eight weeks post-operatively. After that, toe touch-down weight bearing (10-15 kg) started with crutches, or a walker. toe touch-down weight bearing progresses to full weight bearing gradually over a period of the next 2 to 3 weeks. In general, patients are full weight bearing without devices (e.g., cane) by 10-12 weeks (figure 1, 2). All patients were assessed based on knee society score.

Results

24 patients (20 male & 4 female) with isolated Hoffa fracture were operated, between 2018-2021. Most of the patients were male. The minimum follow-up period was 9 months. We have studied functional outcome using knee society score. All the data related to the patients and study is summarized in table 1.

In our series two mode of injury was noted 4 (16.7%) fractures were due to and direct fall from height and 20 (83.3.3%) were due to High energy Road Traffic Accident. RTA being the most common mode of injury might be because of predominance of younger population in this study indulged in outdoor activities. In our study we found that in 18 (75 %) patients, involves lateral condyle and in 6 (25 %) medial condyle was involved. It was not significant with final outcome of this study using Pearson chis quare test (p value is 0.870) at 0.05 level of significance. In this study, a total of 24 Hoffa fracture of femur were selected and classified according to Letenneur Classification. Type 1 fracture was seen in 13 (54.2%) of cases, Type 2 fracture in 6 (25%) and Type 3 fracture in 5 (20.8%) of cases. Screw and/or screws with plates were used for the fixation of the fracture It was found not significant with final outcome of this study using Pearson chi-square test (p value is <0.870) at 0.05 level of significance. It is concluded that, the stable fixation is

required for good outcomes and not the implant used.

Screws were put in anterior to posterior in 17 cases and posterior to anterior in 7 cases direction according to the fracture pattern. It was found not significant with final outcome of this study using Pearson chi-square test (p value is .276) at 0.05

level of significance. It is concluded that, the stable fixation is required for good outcomes and not the direction of screw placement. In this study 1 (4.2%) patient had stiffness, and 1 (4.2 %) had stiffness with malunion. Rest 22 (91.7%) had no complication records are depicted in table 1.

Table 1: Master chart showing all relevant data of this study

Sl No	Name	Age	Sex	Side	Amnt Condyle Involved	Mode of Injury	comorbidity	Classification (Letenneur)	SURGICAL DELAY	SURGICAL APPROCH	Implants Used	Screw Direction	Pain	Range of motion	AP Stability	ML Stability	Flexion Contracture	Extension Lag	Alignment	Walking	Stairs	Deduction	KSS Rating	Functional Rating	Complications	Final Results
1	MS	45	M	R	LAT	RTA	HTN	1	1	AL	S	AP	45	25	10	15	2	0	0	50	40	0	93	90	NONE	EXC
2	SM	38	M	L	LAT	RTA	NONE	1	1	LPP	S&P	AP	45	24	10	15	0	5	0	50	40	0	89	90	NONE	EXC
3	SS	31	M	R	LAT	RTA	NONE	1	2	AL	S	AP	45	20	10	15	2	0	0	50	40	5	88	85	NONE	EXC
4	AB	39	F	R	LAT	FALL	NONE	2	1	LPP	S	PA	45	25	10	15	0	5	0	50	40	0	90	90	NONE	EXC
5	NS	42	M	R	MED	RTA	DM	2	1	DIM	S	PA	40	18	10	15	5	0	0	40	30	5	78	65	NONE	FAIR
6	ND	39	M	L	LAT	RTA	NONE	3	3	AL	S	AP	45	21	10	15	2	0	0	50	40	5	89	85	NONE	EXC
7	SM	38	M	R	MED	RTA	NONE	1	2	DIM	S	PA	40	22	10	15	2	0	0	50	40	5	85	85	NONE	EXC
8	SD	45	M	R	LAT	RTA	HTN	1	3	AL	S	AP	40	18	10	15	5	0	0	40	30	5	78	70	NONE	GOOD
9	RK	42	M	L	LAT	RTA	NONE	2	1	LPP	S	PA	40	20	10	15	0	5	0	50	40	5	80	85	NONE	EXC
10	AK	37	F	L	MED	RTA	NONE	1	1	DM	S&P	AP	50	23	10	15	5	0	0	50	40	0	93	90	NONE	EXC
11	JS	32	M	R	LAT	RTA	NONE	3	1	LPP	S	AP	50	22	10	15	0	5	0	50	40	0	92	90	NONE	EXC
12	SR	43	M	R	LAT	FALL	NONE	2	2	LPP	S	PA	40	21	10	15	0	5	0	40	40	5	81	75	NONE	GOOD
13	MR	53	M	R	MED	RTA	DM	2	1	DIM	S&P	PA	40	20	10	15	2	0	0	40	40	5	83	75	NONE	GOOD
14	RS	42	M	R	LAT	RTA	NONE	1	1	AL	S	AP	45	22	10	15	5	0	0	50	40	0	90	90	NONE	EXC
15	HM	34	F	L	LAT	RTA	THY	1	3	AL	S	AP	45	20	10	15	5	0	0	40	40	5	85	75	NONE	GOOD
16	AM	36	M	R	LAT	RTA	NONE	1	1	AL	S	AP	50	20	10	15	5	0	0	40	40	0	90	80	NONE	EXC
17	AC	41	M	R	MED	FALL	NONE	2	1	DIM	S&P	PA	40	16	10	15	5	0	0	30	30	5	76	55	SF & MU	POOR
18	AB	39	M	R	LAT	RTA	NONE	3	2	LPP	S	AP	45	21	10	15	0	5	0	50	40	0	86	90	NONE	EXC
19	BC	38	M	R	LAT	RTA	NONE	3	1	LPP	S	AP	40	20	10	15	0	5	0	50	40	5	80	85	NONE	EXC
20	LR	42	M	R	MED	RTA	HTN	1	4	AL	S	AP	30	14	10	15	10	0	0	40	30	10	59	60	SF	POOR
21	MI	36	F	R	LAT	FALL	NONE	1	2	LPP	S&P	AP	50	20	10	15	0	5	0	50	40	0	90	90	NONE	EXC
22	SK	41	M	L	LAT	RTA	NONE	1	1	AL	S	AP	30	20	10	15	5	0	0	40	30	5	70	65	NONE	FAIR
23	AB	38	M	L	LAT	RTA	HTN	3	1	AL	S&P	AP	40	20	10	15	5	0	0	50	40	5	80	85	NONE	EXC
24	VK	35	M	L	LAT	RTA	NONE	1	2	AL	S	AP	45	21	10	15	2	0	0	50	40	5	89	85	NONE	EXC

Table 2: comparison with other study

Series	Year	MEAN KSS RATING
Onay[43]	2018	78.4
Singh[44]	2017	87.5
Trikha[29]	2017	83.2
Xu[39]	2016	88.8
Zhao[42]	2016	87.9
Gao[31]	2015	85.6
Present study	2019	83.92



Figure 1: Case details 1



Figure 2: Case details 2

Discussion

Hoffa fracture is well known as an intra-articular coronal fracture of the distal

femur, yet it remains one of the most difficult fractures to treat [7]. A high index of suspicion is needed to diagnose these

fractures. Standard AP radiograph may appear unimpressive owing to intact anterior part of condyle; moreover, undisplaced fracture may not be apparent in lateral radiograph. Oblique radiographs and CT scans have been recommended to facilitate the diagnosis of these injuries. CT scan with 3-D reconstruction helps in identifying the exact site of fracture, presence of comminution and assists in preoperative planning [8]. Conservative management has shown unsatisfactory results and non-union [9,10] thus, open reduction with internal fixation is mandatory for good clinical outcomes. Screw fixation is generally accepted as a standard method for treating Hoffa fractures, [7,11] with the internal fixation method undergoing continual improvement. At least two screws should be used to provide biomechanical stability [12,11,13] and the screws must vertically cross the fracture line to achieve compression between the fragments. Results from several studies have shown that Hoffa fracture treated with screws from anterior to posterior or the opposite direction are associated with different clinical outcomes [15,9,13,14]. In addition, a few trials have reported that Hoffa fracture treated with screws and plate provides good clinical results [14]. Open reduction internal fixation is being considered one of the best treatment modalities in such fractures. In the present study, 24 cases of Hoffa fractures have been managed by open reduction and internal fixation. The purpose of this study is to study the functional outcome of Hoffa fractures. The data collected in this study is assessed, analyzed and compared with other series and the results were evaluated (table 2) [15].

Conclusion:

Hoffa fractures occur most commonly in young active individuals involved in outdoor activities. Road traffic accidents are the most common cause of Hoffa fractures in the young population, fall is

other major predisposing factor. Anatomical reduction along with maintenance of articular congruity, rigid fixation and post-operative rehabilitation gives good to excellent results. Open reduction and internal fixation for Hoffa fractures provides good to excellent results in 83.4% of cases with knee society score.

Informed Consent Statement

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Informed consent was obtained from all patients for being included in the study.

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