

# Evaluation of Complications in Patients Undergoing Treatment for Femoral Shaft Fractures with Undreamed Intramedullary Nailing

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## ABSTRACT

**Background:** Fracture of the shaft of femur is a commonly seen fracture in orthopedic practice, and it is frequently associated with injuries to other sites. The aim of the present study is to evaluate the Complications in Patients Undergoing Treatment for Femoral Shaft Fractures with Undreamed Intramedullary Nailing.

**Materials and Methods:** The present prospective study was conducted in the department of Orthopedics, Government District Hospital, Dungarpur, Rajasthan. The variables studied in the survey included evidence of clinical and radiological union and associated postoperative complications. Complete union was considered when there was callus formation at all 4 cortices. All the data was arranged in a tabulated form and analyzed using SPSS software.

**Results:** The present prospective study was conducted amongst 70 subjects of isolated femur fracture. The mean age of the subjects was 38.48+/-11.65 years. There were 7.1% (n=5) cases of nonunion. There were 4.3% (n=3) cases of nail breakage. There were 1.4% (n=1) case each of delayed union and rotational malunion.

**Conclusion:** Only major complication associated with our study was non-union. Closed reduction of comminuted fractures provides a method of union without any chances of infection.

**Keywords:** Femur, Intramedullary, Nailing.

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## Article History:

Received: 11-11-2017, Revised: 19-12-2017, Accepted: 17-01-2018

## Access this article online

Website: <a href="http://www.ijmrp.com">www.ijmrp.com</a>	Quick Response code 
DOI: 10.21276/ijmrp.2018.4.1.118	

## INTRODUCTION

Fracture of the shaft of femur is a commonly seen fracture in orthopedic practice, and it is frequently associated with injuries to other sites. Femur is the longest, largest and most important supporting bone of lower limb. Fractures of femur result in long term morbidity and disability irrespective of the treatment protocol followed.<sup>1</sup> In the year 1939, Küntscher introduced intramedullary nailing for the stabilization of fractures of long bone.<sup>2</sup> The introduction of intramedullary nailing has brought a revolution in the management of fractures. The gold standard for the management of nailing of femoral fractures is antegrade femoral nailing. It has a success rate of 99% with the infection and malunion rate of less than 1%.<sup>3,4</sup> Fractures of femoral shaft are generally because of high energy trauma and amongst young adults. Closed intramedullary nailing for early fixation is the method of choice amongst subjects with multiple injuries.<sup>5</sup> Regardless of the treatment method of choice, the alignment should be restored, the vascular supply to the area should be intact to promote union and infection prevention and early rehabilitation should be followed.<sup>6</sup> The aim of the present study is to evaluate the Complications in Patients Undergoing Treatment for Femoral Shaft Fractures with Undreamed Intramedullary Nailing.

## MATERIALS AND METHODS

The present prospective study was conducted in the department of Orthopedics, Government District Hospital, Dungarpur, Rajasthan, India.

All the subjects were informed about the study and a written consent was obtained from them in their vernacular language. Subjects with isolated diaphyseal femoral shaft fractures, fractures within 1 month of injury and follow up period of more than 4 weeks were included in the study. Subjects with bilateral fractures, multiple injuries or pathological type of fractures were excluded from the study.

The variables studied in the survey included evidence of clinical and radiological union and associated postoperative complications. Complete union was considered when there was callus formation at all 4 cortices. Complications like non-union, mal union, infection etc were evaluated during the study period. Single operator was used to perform the surgeries and same examiner observed the subjects during the follow up period to avoid any human error. All the data was arranged in a tabulated form and analyzed using SPSS software. Statistically significant difference was defined as  $p < 0.05$ .

## RESULTS

The present prospective study was conducted amongst 70 subjects of isolated femur fracture. The mean age of the subjects was 38.48±11.65 years. There were 47 males and 23 females in the study population. The average time between fracture and surgery was 13.08 days. The mean follow up duration was 36.21 weeks. There were 41 subjects with fracture of right femur and 29

subjects with left femur fracture. (Table 1) Table 2 shows the complications associated with the study. There were 7.1% (n=5) cases of nonunion. There were 4.3% (n=3) cases of nail breakage. There were 1.4% (n=1) case each of delayed union and rotational malunion. There were no cases of infection in our study. Shortening was seen amongst 2.8% (n=2) cases of shortening.

**Table 1: Demographic characteristics of the subjects**

Characteristics		Study subjects
Age		38.48±11.65 years
Gender	Male	47
	Female	23
Time to surgery		13.08 days
Mean follow up (weeks)		36.21
Side of fracture	Right	41
	Left	29

**Table 2: Complications associated with fixation**

Complications	Frequency	Percentage
Non Union	5	7.1
Nail Breakage	3	4.3
Delayed Union	1	1.4
Rotational Malunion	1	1.4
Infection	0	0
Shortening	2	2.8

## DISCUSSION

Surgical management and explanation of femur fractures are guided by classification systems like those given by Winquste Hansen and the AO/Orthopedic Trauma Association.<sup>7,8</sup> Several treatment varieties are present for shaft of femur fractures which depending on pattern of fracture, comminution degree, location of fracture, and involvement of soft tissue. With the discovery of Intramedullary nailing, there is improved angular and rotational regulation of fractures fragments especially in case of comminuted and oblique fractures of femur shaft. According to study by Brumback et al, immediate weight bearing is thinkable for diaphyseal femoral shaft fractures that have retained cortical contact, when nails <12 mm were used.<sup>9</sup> The demographics associated with our study were, the mean age of the subjects was 38.48±11.65 years. There were 47 males and 23 females in the study population. The average time between fracture and surgery was 13.08 days. The mean follow up duration was 36.21 weeks. There were 41 subjects with fracture of right femur and 29 subjects with left femur fracture. The viable starting points for antegrade nailing include piriform fossa and the greater trochanter, if any of these is not intact than retro grade nailing is performed. Both the techniques have its own advantages and disadvantages.

The primary advantage associated with non-reamed nailing is preservation of blood supply and that of reamed nailing is rigid and stronger fixation with early union of the fracture sites.<sup>10,11</sup>

According to a study conducted by Sadic et al<sup>12</sup> healing rate of 93.6% was seen with 6.25% non-union and 4.2% nail breakages. According to our study, there were 7.1% (n=5) cases of nonunion. There were 4.3% (n=3) cases of nail breakage. There were 1.4% (n=1) case each of delayed union and rotational malunion. There were no cases of infection in our study. Shortening was seen amongst 2.8% (n=2) cases of shortening. The few drawbacks of the study included lack of uniform follow up period and there was no patient related functional outcome measurement.

## CONCLUSION

Intramedullary nailing provides a method of quick fixation with lesser hospital stay. It also provides early return to work with short disability time. Only major complication associated with our study was non-union. Closed reduction of comminuted fractures provides a method of union without any chances of infection.

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**Source of Support:** Nil. **Conflict of Interest:** None Declared.

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**Cite this article as:** Santosh Kumar Yadav. Evaluation of Complications in Patients Undergoing Treatment for Femoral Shaft Fractures with Undreamed Intramedullary Nailing. *Int J Med Res Prof.* 2018 Jan; 4(1):552-54.

DOI:10.21276/ijmrp.2018.4.1.118