

## A Hospital-Based Study Examined the Results of Retrograde Nailing for Surgical Stabilisation of Femur Distal 1/3rd Fracture Shaft

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### Abstract

**Objective:** 6% of all femoral fractures are in the 1/3<sup>rd</sup> distal of the femur. The objective of this research was to assess the effectiveness of retrograde nailing in surgically stabilizing a distal 1/3<sup>rd</sup> fractured shaft femur.

**Methods:** Retrograde nailing was used to treat 55 patients with 1/3<sup>rd</sup> distal of femur fractures in both genders. Modality of injury, kind of fracture, range of motion (ROM), time from injury, length of surgery, amount of time needed for fracture healing, and functional evaluation using Lysholm knee grading were among the parameters highlighted.

**Results:** 25 of the 55 patients were female and 30 were male. 31 patients had RTA injuries, 11 had sports injuries, 10 had fallen, and 4 had other types of injuries. The type of fracture was closed in 31 cases and complex in 24. Mean knee flexion (degree) measurements were 42.5 at 1 month, 90.1 at 2 months, 112.4 at 5 months, and 121.3 at 12 months. The difference was noteworthy ( $P < 0.04$ ). Lysholm's knee rating was Excellent in 35 patients, good in 15, and fair in 5. The difference was noteworthy ( $P < 0.04$ ).

**Conclusion:** It was shown that retrograde nailing is a suitable therapeutic option for distal femur fractures. This procedure involves surgical stabilization of the distal 1/3<sup>rd</sup> fracture shaft of the femur.

**Keywords:** Lysholm Knee Scoring, Retrograde Nailing, And Femoral Fractures.

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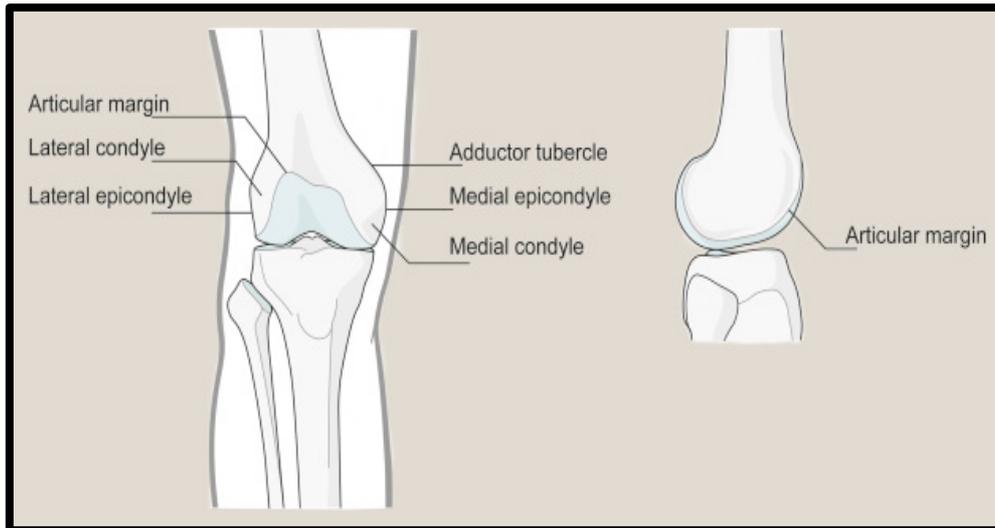
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### Introduction

6% of all femoral fractures are in the 1/3<sup>rd</sup> distal of the femur [Figure 1]. These fractures have a bi-modal distribution in which younger age groups having-energy trauma whereas older age have groups below-energy fractures brought on by

osteoporosis. These injuries are severe and challenging to treat because of the substantial comminution, soft tissue damage, and extension of the fracture into the knee joint, neurovascular damage, and injury to the extensor mechanism [1,2].



**Figure 1: 1/3<sup>rd</sup> distal femur Fracture**

Following the AO principles of anatomic reduction of the articular surface and restoration of limb alignment, length, and rotation, the treatment's objectives. Despite advancements in implant design, treating distal femur fractures is still difficult because they frequently contain osteoporotic bone, are intra-articular, and are comminuted. The prevalence of comorbidities is considerable in the geriatric trauma group and may affect the available therapeutic options [3].

The option of retrograde nailing can be used to treat distal femur fractures. Retrograde nailing has several benefits over plate fixation, including the ability to repair ipsilateral hip and ipsilateral tibia fractures in polytrauma patients and the ability to introduce the nail through smaller incisions with less disturbance to soft tissue [4].

The objective of this research was to assess the effectiveness of retrograde nailing for surgical stabilization of distal third femur shaft fracture.

## Methods

**Study Design:** The current investigation is an observational study that took place between January 2021 and December 2022 in the emergency room or outpatient department of SCB Medical College, Cuttack

**Methodology:** The serial diameters of the intramedullary supracondylar nail are 10, 11, and 12 mm, and the lengths are 10, 15, and 20 cm. The patient was positioned supine with the knee flexed to 40 degrees during surgery on a radiolucent operating table. Two percutaneously inserted K wires were initially used to stabilize intercondylar fractures. In cases of intra-articular comminuted fractures, arthroplasty was performed. 52 times through the patellar tendon, twice through a medial arthrotomy, and three times through a lateral arthrotomy were used to provide access for the retrograde nailing. These methods solely based on the surgeon's preference and the type of fracture. The fluoroscope was used to locate the starting location, and a curved awl was used to start the medullary canal. Except in osteoporotic fractures, an intramedullary guiding pin is inserted into the femoral canal; the entry point was reamed to a diameter 2 mm larger than the chosen nail, thanks to intramedullary reaming. Next, with the aid of fluoroscopy, the intramedullary supracondylar nail was placed over the guide wire. The longest and thickest nail was preferred in order to get the best stabilisation. At least two screws were used to lock the nail both proximally and distally. Names, ages, genders, and other information were

recorded. Retrograde nailing was used to treat all of the patients. The following parameters were recorded: manner of injury, kind of fracture, range of motion (ROM), time from injury, length of operation, time for fracture healing, functional evaluation using Lysholm knee grading, etc.

**Sample Size:** 55 individuals with femur distal 1/3<sup>rd</sup> fractures of both genders participated in the current investigation.

**Statistical Analysis:** The statistical analysis was performed using Microsoft Excel. Thusly collected data were analysed statistically. P value < 0.04 was regarded as significant.

**Ethical Consideration:** The ongoing study was approved by the Ethical

Committee of SCB Medical College, Cuttack

## Results

The study consisted of 30 Men, while women made up 25, totaling the total number of patients to be 55.

Table 1 depicts that RTA injuries made up 31 patients, whereas sports injuries made up 11, falls made up 10, and miscellaneous injuries made up 4. Closed fractures occurred in 31 cases while complicated fractures did so in 4. At one month, the mean knee flexion (degree) readings were 42.5; at two months, 90.1; at five months, 112.4; and at twelve months, 121.3. The difference was important (P < 0.04).

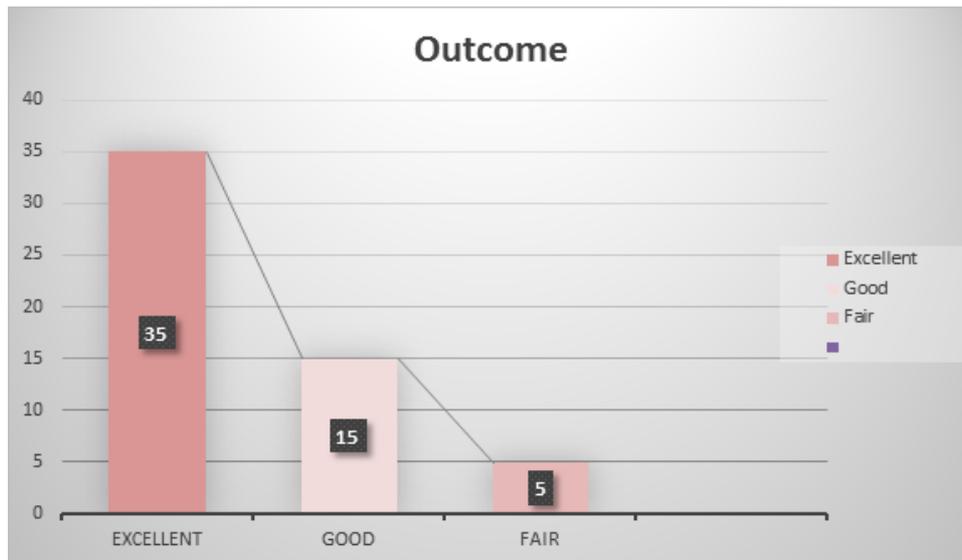
**Table 1: Analysis of Parameters**

Criteria	Variables	Numbers	P-Value
Type of Fracture	Closed	31	0.03
	Compound	24	
Mode Of Injury	Fall	10	0.93
	RTA	31	
	Sports Injury	11	
	Other	4	
Mean flexion at the knee (degree)	1 month	42.5	0.04
	2 months	90.1	
	5 months	112.4	
	12 months	121.3	

Three patients (20%) were in the age category of 41-50 years, three patients (10%) were in the age group of 51-60 years, and six patients (34%) were in the age group of 31 to 40 years. The average age of the participants was 43.5±17.66 years. It took an average of 2 days from the injury until the operation. The average procedure lasted 90 minutes. 15 patients, or 27%, had solitary femoral fractures, while 5 patients, or 9%, had polytrauma. The average amount of time for a fracture to

heal was 18.3 weeks (SD±6.73). The postoperative knee range of motion (ROM) was obtained in 7 patients (41%) with 125°, 5 patients (21%), 135°, 140°, 105°, 4 patients (13%) with 110°, and 2 patients (4%) with 115°, with a mean of 123.74°.

According to Graph 1, Lysholm knee scores were excellent in 35 patients, Good in 15, and fair in 5. The distinction was important (P < 0.04).



**Graph 1: Distribution of patients' based on Lysholm knee scores**

## Discussion

Fractures of the supracondylar and intercondylar regions of the distal femur are classified as distal femur fractures and are rather common injuries. This fracture needs to be diagnosed and treated right away in order to reduce the substantial morbidity and mortality associated with it [5]. 6% of all femoral fractures are in the distal 1/3<sup>rd</sup> of the femur. These fractures have a bimodal distribution, with high energy fractures from trauma occurring in younger age groups and low-energy fractures from osteoporosis occurring in older age groups [6]. In order to avoid a stress riser in the subtrochanteric region, retrograde nails of standard length should extend to the level of the lesser trochanter. Simple intra-articular fractures can have their articular surface restored using newer implants that provide options for multiple distal screw fixation [7]. According to biomechanical research, the strength of a nail is significantly influenced by the quantity, direction, and quality of the distal locking screws [8]. The goal of the current study was to assess the effectiveness of retrograde nailing for surgical stabilization of distal 1/3<sup>rd</sup> femur shaft fracture. Shekhaheswar De [9] examined its efficacy in fixing a distal third of femur fracture

with a focus on the results and inherent surgical difficulties.

The clinical and radiological effects of stabilizing distal 1/3<sup>rd</sup> femoral fractures employing retrograde nailing designs were assessed and compared by Prasanna A et al [10]. 113 patients required distal femoral retrograde nailing during surgical treatment. Lysholm's knee grading was used to examine the results, which showed that superb was the case in 55 cases (48.67%), good in 39 cases (34.51%), fair in 11 cases (9.73%), and poor in 8 cases (7.07%). The distal femoral fracture union and retrograde distal femoral nailing were substantially positively correlated, according to a correlation analysis with Pearson's correlation coefficient ( $r$ ) of 0.8.

The effectiveness of applying RN or LISS procedures to stabilize distal femur fracture was assessed and compared by Hierholzer C et al [11]. They examined 115 distal femur fracture patients who had had retrograde IM nailing (59 patients) or LISS plating as treatments (56 patients). In 57% (53% RN, 67% LISS), high energy impact was the cause of the injury, whereas in 43% (47% RN, 33% LISS), low energy injury was the cause. According to the AO classification, there were 52 type A fractures (RN 31, LISS 21) and 63 type C fractures (RN 28, LISS 35);

accordingly, 32% (RN) and 56% (LISS) were open fractures and 68% (RN), 44% (LISS), and 68% (RN), were closed fractures. [12]

### Conclusion

The best therapeutic choice for distal femur fractures, it was determined, is retrograde nailing for surgical stabilization of the distal 1/3<sup>rd</sup> fracture shaft femur.

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