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**Dr. RC Thakur**

Director, Department of  
Orthopedic, Ortho Surgical Care  
Center, Kashi Bazar, Chapra,  
Saran, Bihar, India

## **A comparative study of RCT nail introducer-cum-positioner with colour-coded tibial nail extractor in Dr. Thakur innovative technique of suprapatellar nailing of tibia**

**Dr. RC Thakur**

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### **Abstract**

A study was conducted on 25 cases of tibial fractures (between April 2021 to April 2022) in which RCT tibial nail introducer was used as a nail-positioner-cum-nail-introducer (Group 1) to treat the tibial fractures. The results of this study was retrospectively compared with 25 cases of tibial fractures treated by Dr. Thakur Innovative Technique of Suprapatellar Nailing of Tibia (between March 2020 to March 2021) in which infrapatellar-tibial-nail-extractor was used as nail-positioner-cum-introducer (Group 2). It was found that the surgical time and fluoroscopy time was slightly less in Group 1 compared to Group 2. But the nail could be kept in proper position by derotation while hammering was more easily and accurately done in Group 1 compared to Group 2. In both groups, the fixation was done by Dr Thakur Innovative Technique of Suprapatellar Nailing of Tibia and locking was done by free hand technique both proximally as well as distally.

**Keywords:** Callus formation time, colour-coded tibial nail extractor, fluoroscopy time, fracture healing time, operative time, RCT tibial nail introducer cum positioner, suprapatellar nailing

### **Introduction**

Suprapatellar nailing is becoming a popular choice for all region fractures of tibia although it was started primarily for extra articular upper metaphyseal fractures. It has many advantages over infrapatellar nailing of tibia like less tissue dissection, less bleeding, easy and accurate finding of entry point, less infection, less incidence of malalignment of fracture and no postoperative knee pain. Moreover, researchers have proved that intra-articular structures are safe in suprapatellar nailing of tibia. Dr. Thakur Innovative Technique of Suprapatellar Nailing of Tibia achieves satisfactory union at a very low cost, costing only 1-2% of the total cost of implants and instrument sets used in the standard technique. In this study we used RCT tibial nail introducer cum nail positioner in 25 cases of tibial fractures (between April 2021 to April 2022) for introduction of nail in proper position in Dr. Thakur Innovative Technique of Suprapatellar Nailing of Tibia (Group 1). The result was compared retrospectively with 25 cases of tibial fractures (between March 2020 to March 2021) fixed by Dr. Thakur Innovative Technique of Suprapatellar Nailing of Tibia in which colour-coded tibial nail extractor was used to keep the nail in proper position while hammering the nail (Group 2). Surgical and fluoroscopy times were slightly shorter in Group 1 than in Group 2, but the difference was statistically insignificant. However, the nail could be kept in place more easily and accurately in position in Group 1 than Group 2.

### **Material and Method**

We conducted a study on 25 cases of tibial fractures (Between April 2021 to April 2022).

**Corresponding Author:**

**Dr. RC Thakur**

Director, Department of  
Orthopedic, Ortho Surgical Care  
Center, Kashi Bazar, Chapra,  
Saran, Bihar, India

All fractures were fixed by Dr. Thakur Innovative Technique of Suprapatellar Nailing of Tibia and RCT tibial nail introducer cum nail positioner was used to keep the nail in proper position while hammering the nail (Group 1). The study results were compared with 25 cases of tibial fractures fixed by Dr. Thakur Innovative Technique of Suprapatellar Nailing of Tibia (between March 2020 to March 2021) in

which colour-coded tibial nail extractor was used for proper positioning of nail while hammering (Group 2). In Group 1, a locking system was used to mount the nail over RCT tibial nail introducer cum nail positioner and TOMY BAR was used to derotate the nail in proper position while hammering. Age, sex, mode of trauma depicted in table 1 for both Group 1 and Group 2.

**Table 1:** This table depicts the age, sex, mode of trauma for both Group 1 and Group 2 used in the study

Clinical Details of Patients	Group 1	Group 2
Age years (range)	35.5 (18-65)	35.5 (18-60)
<b>Gender, n (%)</b>		
Male	20 (80%)	21 (84%)
Female	5 (20%)	4 (16%)
<b>Causes of fractures, n (%)</b>		
Road traffic accidents	20 (80%)	18 (72%)
Falling from height	5 (20%)	7 (18%)



**Fig 1:** RCT tibial nail positioner cum nail introducer used in Group 1 and Colour coded tibial nail extractor used in Group 2 (second picture)

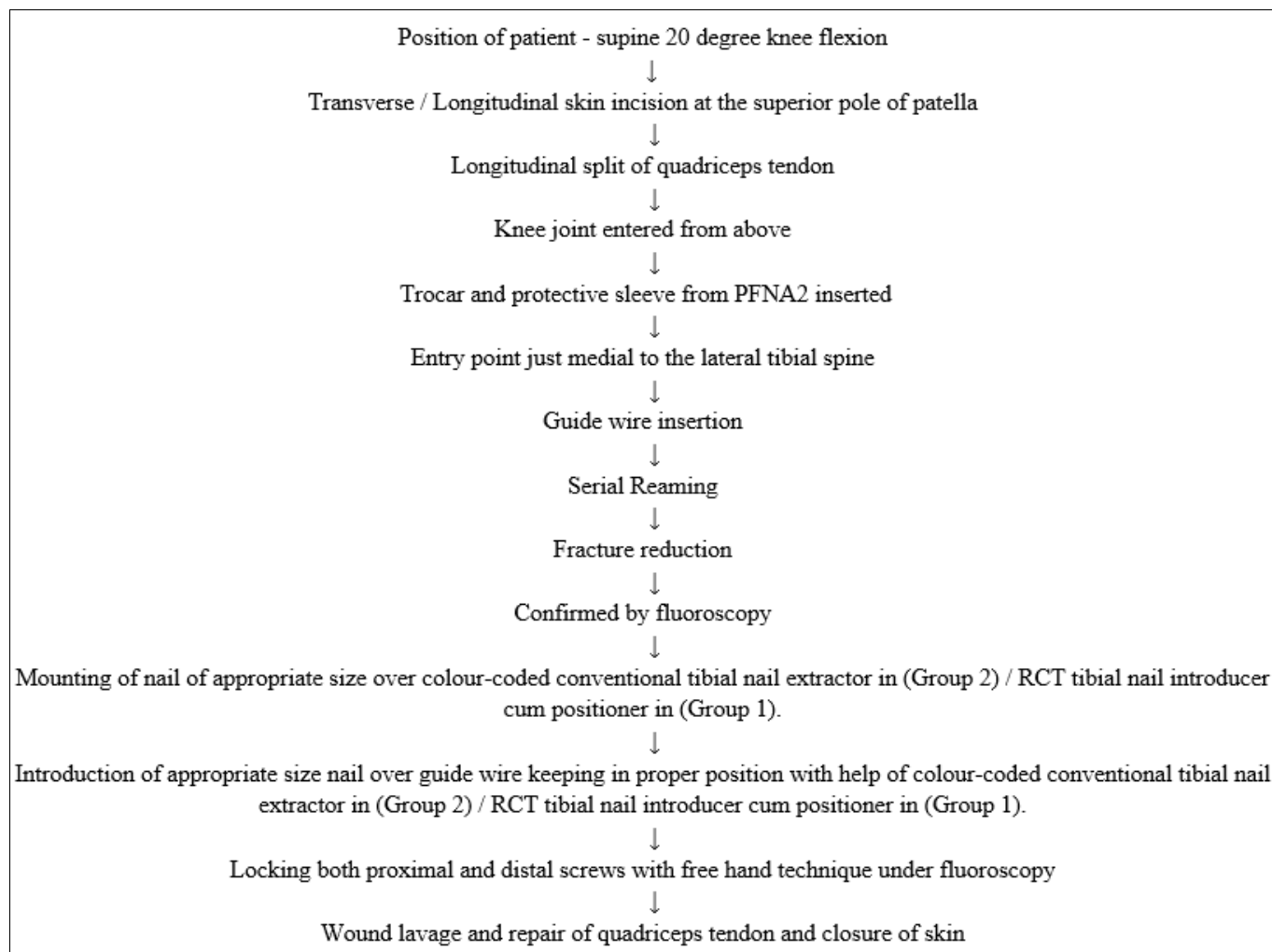


**Fig 3:** Proximal locking by free hand technique

### Method Flow Chart

This flowchart discusses how Dr. Thakur Innovative

Technique of Suprapatellar Nailing of Tibia was performed in semi-extended position of knee:



### Observations

In Group 2, the screwing system was used for mounting the nail over the colour-coded tibial nail extractor in which clockwise derotation could be done very well but anticlockwise derotation was done by various tricks, tips, estimations and calculations. There was variation of 5 to 10 degrees from normal on the final seating of the nail. In group 1, the nail could be positioned exactly and accurately on final

seating because TOMY BAR was used to position the nail and a locking system used to lock the nail over the RCT tibial nail introducer cum nail positioner which allowed both anticlockwise as well as clockwise derotation accurately and easily.

### Group 1: Pictures



**Fig 4:** Post Op X-ray of upper metaphyseal fracture of tibia

**Fig 5:** Clinical pictures after 3 weeks follow up





**Fig 6:** Preoperative radiograph of fracture lower 1/ 3rd tibia



**Fig 7:** Postoperative radiograph of fracture lower 1/ 3rd tibia.

## Group 2: Pictures



**Fig 8:** Preoperative radiograph of fracture lower & middle 1/3rd Jn. tibia



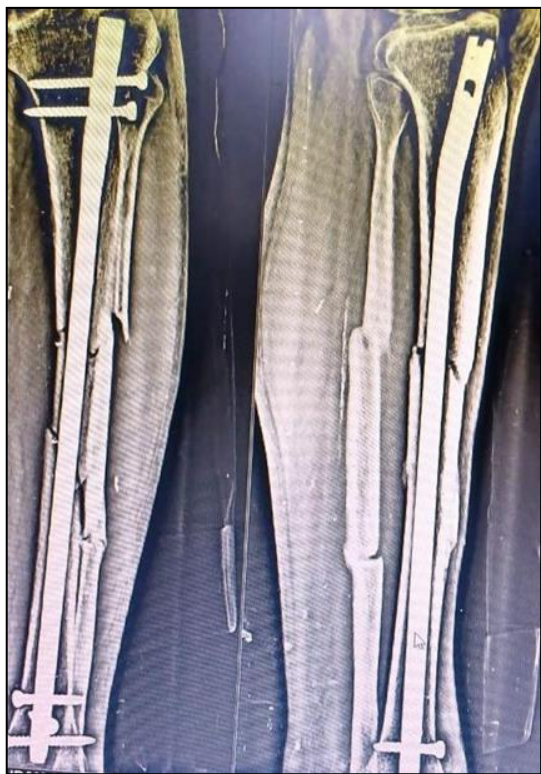
**Fig 9:** Postoperative radiograph of fracture lower & middle 1/3rd Jn. Tibia



**Fig 10:** Three weeks postoperative clinical picture



**Fig 11:** Preoperative radiograph of segmental fracture of tibia



**Fig 12:** Postoperative radiograph of segmental fracture of tibia



**Fig 13:** Three weeks postoperative clinical picture of segmental fracture of tibia.

**Table 2:** This table depicts the age, sex, mode of trauma for both Group 1 and Group 2 used in the study

Observation	Group 1	Group 2
Average Operating time	78.2±10 minutes	80±10 minutes
Range operating time	65 – 110 min	65 – 110 min
Average Fluoroscopy time	37.4±6.5 sec	38.5±6.5 sec
Range Fluoroscopy time	15 to 55 sec	10 to 50 sec
Average Hospital stay	11±1 days	11±1 days
Average Fracture union time	8 weeks	8 weeks
Average Fracture healing time	12 weeks	12 weeks

## Conclusion and Discussion

Although there is no statistically significant difference in fluoroscopy and surgical time in both groups. But the derotation could be done more easily and accurately in Group 1 than Group 2 in which a dedicated RCT nail positioner cum nail introducer was used. Fracture union time, callus formation time, complication rate were same in both groups

except in Group 1 one case of subacute screws site infection was found which subsided after implant removal.

## Conflict of Interest

Not available

## Financial Support

Not available

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## How to Cite This Article

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