



FUNCTIONAL OUTCOME IN SUPRACONDYLAR FRACTURE OF FEMUR TREATED WITH RETROGRADE NAILING: A RETROGRADE STUDY.

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ABSTRACT **Background and objectives:** Distal third femur fractures are often difficult to treat. For many complications like knee stiffness, quadriceps wasting, knee instability, malunion, non-union, joint incongruity, shortening, prolonged bed-rest and post-traumatic osteoarthritis when treated conservatively. Intramedullary retrograde nailing reduces the tendency of varus movement at fracture site. **Results:** In 25 patients, male predominate is 88%. Using Neer's scoring system there were 56% excellent, 16% good, 24% fair, 1% poor results.

KEYWORDS : Retrograde supracondylar nail; Closed reduction; Early post-operative mobilization; Weight bearing

INTRODUCTION

The obvious advantage of an intramedullary device is that it aligns the femoral shaft with condyles reducing the tendency to place varus movement at the fracture site, preservation of fracture hematoma, decreased blood loss, minimal soft tissue dissection, less operative time and reduced rate of infection. Operative management has become the favourite option, as several studies have confirmed the superior results of surgical treatment compared to conservative management [1,2]. Wu et al. looked at the results of antegrade intramedullary nailing in extra-articular distal femoral fractures, and compared it to plating, and found a superior union rate (90% compared to 79% for plating) and better range of knee movement [3].

Review Of Literature

Armstrong R et al[4](2003) - 27 fractures of distal femur in 27 adults patients were treated with retrograde interlocked intramedullary nailing, post operatively early mobilization exercises began immediately. Until clinical union was achieved, full weight bearing was not permitted.

In 2007, **S El-Kawyet al[5]** He concluded that retrograde femoral nailing is a surgically limited and reliable procedure for elderly patients with supracondylar fractures of femur without intraarticular extension

Mechanism Of Injury

The mechanism of supracondylar fractures in most cases is axial loading with varus or valgus as rotational forces. High velocity trauma is culprit in young generation where considerable fracture displacement, comminution and open wound may be seen. In the elderly with osteoporotic bones, trivial trauma on flexed knee can cause this fracture. The "T" or "Y" type of condylar fractures are produced by wedging effect of the proximal fragment on the distal condyles. The artery may be damaged at the time of injury or compressed by the sharp margins of the distal fragment of the femur. Neurological damage is rare.

Classification

Classification systems used in study is - AO classification.
AO Classification:

METHODOLGY

All the cases were treated in our Medical college and Hospital, between the period of June 2021 to Jan 2023. The method used for fracture fixation was closed or open reduction and internal fixation with retrograde intramedullary supracondylar nail. The duration of follow up ranged from 4 month to 6 months.

Patient Selection:

Patients operated in our College and Hospital, Dhule with

supracondylar and intercondylar fractures of femur with:

- Type-A fractures (AO classifications).
- Grade I/II/III/ IIIB compound fractures (Gustilio - Anderson Classification).
- Pediatric patients and pathological fractures excluded.



Operative Procedure:

A midline incision of 4 cm was taken from inferior pole of patella up to tibial tuberosity. The paratenon over patellar tendon was sharply incised and patellar tendon was split in the midline along the direction of its fibres. Solapur sleeve was then inserted into the joint through the split tendon and positioned against the inter-condylar notch. Its position was checked under image intensifier and the distal fragment was drilled with a 6.5 mm drill bit inserted through the sleeve. The position of drill bit was checked under image intensifier in anteroposterior and lateral position. The guide wire passed through the entry point. The fracture was reduced under image intensifier control and guide wire passed in proximal fragment. The distal fragment was then reamed. The predetermined nail of adequate diameter and length was then loaded over the jig. The nail was then inserted over the guide wire. Its position was confirmed on image intensifier and then depending on the length of the nail, the proximal holes were locked with the help of corresponding markings on the jig. Self-tapping interlocking bolt of 4.9mm thread diameter passed from lateral to medial cortex engaging the locking hole in the nail. Both holes were locked proximally. Similarly, the distal holes were locked in one, two or three numbers. The joint was washed thoroughly to remove the debris. Tourniquet was released, hemostasis achieved and incision closed in layers. Particular attention was paid to repair paratenon of patellar tendon.

Postoperative:

If intraoperative open reduction was required, above-knee slab was given. In the wards, limb elevation was done along with injectable

antibiotics for 5-10 days. Patients in whom closed nailing was achieved were shifted on second post-operative day CPM machine and knee was flexed passively till 80 degree. In closed nailed patients, static quadriceps and active or active assisted bedside knee mobilization was started from second postoperative day. Suture removal was done on 14th postoperative day. In patients with open reduction, the slab was discarded if wound was found to be healthy then active/ passive knee mobilization was instituted. Patients were discharged on day 15 or 17th postoperative and were advised to follow-up after 1 month. In the mean time, between suture removal and discharge patients were made ambulatory on walker without weight bearing.. Further, weight bearing was allowed depending on the clinical and radiological picture. At each follow-up patient was assessed as regards clinico-radiological union. For each fracture type, the long-term results were evaluated using Neer's rating system which assigns points for pain, working and walking capacity, range of movement, radiological appearance, etc.

Criteria for evaluation of the results (from NEER CS, II GRANTHAN SA and SHELTON ML)[6]

Excellent - more than 85 points
Good..... 70 to 85 points
Fair 55 to 69 points
Poor less than 55 points

However, if an elderly patient has persistent local pain and the fracture has healed unequivocally, the implant can be removed.

RESULTS

Age Distribution: Age of the patients ranged from 25 to 60 years with an average age of 37.4 years. Male patients were average of 35.5 years. Female patients were average of 51.6 years.

Side affected: Right side was involved in 68% of the fractures and left was accounting for 32% of the fractures.

Type of fracture: Out of 25 fractures, only 7 fractures accounting for 28% were open fractures.

Type of fracture based on AO classification: Out of 25 fractures, type A1 fractures were 10 patients(40%), 13 patients(52%) were type A2 fracture and A3 in 2patients(8%).

Duration of surgery: Average operative time for all fractures was 83.92 minutes.

Follow up: All the patients were followed up from 4 to 6 months. All fractures united eventually.

Time to union: Average time for fracture union was 16.16 weeks (ranging from 16 to 24 weeks). There was 1 delayed union. There were no non unions. There were no malunions. Average full weight bearing was achieved by 11.68 weeks.

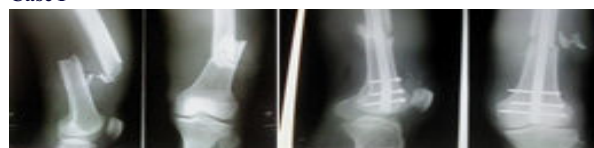
Knee flexion: Average flexion in this study was 100 degree with more than 50% patients having knee range of motion more than 110 degree.

Complications: The complications we encountered include anterior knee pain in 8 patients, shortening in 4 patients and 3 patients had the nail projecting into the knee joint causing patella-femoral impingement and arthrosis. There was two cases superficial infection which subsided after debridement and antibiotics. There was one delayed union. There were no cases of implant failures.

Functional rating as per Neer's rating score: Neer's score was assigned for each patient after 20 to 24 weeks. Using this scale there were 14(56%) excellent results, 4(16%) good results, 6(24%) fair results and 1(4%) poor result.

Radiological photographs:

Case 1



Preoperative

Postoperative,



6 weeks post operative,

14 weeks post operative

Case 2



Preoperative.

Postoperative

Comparing our data with the previous series, we found similar results regarding union rates, outcome and complications

All our criteria are matching with the other series in the literature.

Series	Functional results	Complications
Present	Neer's score 56%excellent, 16%good,24%fair,1%poor	8 knee pain,4 shortening 3 nail protrusion,1delayed union,2infection

We used Neer's score since it emphasizes on important patient outcome variables. Younger patients attained better results than the elderly patients. Presumably this is because the younger group adhere to strict and vigorous physiotherapy postoperatively than elderly group.

CONCLUSIONS

1. Retrograde intramedullary supracondylar nail is a good fixation system for distal third femoral fractures, particularly extra-articular type.
2. The operative-time is lessened with decrease in blood loss.
3. If closed reduction can be achieved by not disturbing fracture hematoma and soft tissue.
4. Even with open reduction, there is less soft tissue trauma and less postoperative stiffness.
5. There is no non-union, less delayed unions and rates of angular or rotational malunions.

Consent from the patient taken for this study.

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Conflict of interest – nil.

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