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Management of Supracondylar Fracture of Femur by Retrograde Interlocking Nail- A Prospective Study

Dr Arunjith Shaji MS Ortho[1], Dr Shilpa C Baby MBBS[2]
Corresponding author-Dr Arunjith Shaji MS Ortho[1]
[1]-Consultant orthopaedic and Trauma Surgeon SVSS Sanjeevani multispecialty hospital Badvel, Kadapa
[2]-Post Graduate Resident department of emergency medicine GMC Kadapa

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ABSTRACT

Supracondylar and intercondylar fractures of distal femur historically have been difficult to manage. These fracture are often unstable , comminuted and tend to have a distribution in 2 age poles. Intramedullary nailing has received more limelight for the treatment of distal femoral fracture , as these devices obtain more "**Biologic fixation**"than lateral fixation devices.

Methods 30 cases of supracondylar femur fractures were included in this study. The clinical and radiological outcome for 30 patents who were treated between 2022 January to 2023 March at institution were assessed, functional outcomes were evaluated based on Lysholm knee score.

Results Fracture union occurred on an average between 14-16 weeks, functional outcomes were excellent to good in 80% of the patients based on Lysholm knee score, The most common complication and limiting factor in retrograde nailing remains as anterior knee pain, there were no cases of non union or deep infection.

Conclusion The supracondylar nail provides rigid internal fixation for rapid healing of supracondylar fractures with a comparable functional outcome to lateral fixation devices with minimal soft tissue dissection

Keywords: supracondylar femur fractures, biologic fixation, functional outcome, Lyscholm knee score

I. Introduction

The supracondylar region of the femur refers to the distal segment extending from the femoral condyles up to the metaphyseal–diaphyseal junction, covering an approximate length of 15 cm from the articular surface. Fractures in this region are relatively uncommon, comprising about 6% of femoral fractures and less than 1% of all fractures overall[1]. Intramedullary nailing has gained increasing acceptance in the management of distal femoral fractures, as it provides a more biological mode of fixation compared to plating systems by functioning as a load-sharing rather than load-bearing implant. The primary objectives of surgical treatment include achieving stable internal fixation, enabling early mobilization of adjacent joints, and facilitating prompt knee rehabilitation.

II. Materials & Methods

This was a prospective interventional study, which was carried out in our institution for a period of 15 months from 2022 January to 2023 March. The clinical and radiological outcomes for 30 patients were assessed, and functional outcomes were evaluated based on the Lysholm knee score[2]

Inclusion criteria

- Age >18 years
- Closed, Gustilo-Anderson type 1, type 2 supracondylar femur fractures

Exclusion criteria

- Patients who were not fit for surgery
- Patients with a distal neurovascular deficit.

Fracture types were classified as per AO classification[3] with the help of AP and lateral view radiographs of affected thigh and a CT scan of the fractured supracondylar area. Cases were followed after 1,2,3 and 6 months of surgery. At each assessment, all patients were assessed about pain, use of analgesics, stiffness of knee joint, swelling, activities of daily living, use of walking aids, return to work and participation in sports .

During the examination, gait of the patient and the range of motion of the knee were evaluated. Anteroposterior and lateral radiographs of the knee with thigh were made at the time of every followup visit. Functional outcomes were evaluated based on the Lysholm knee score.

III. Results

1.**Sex incidence**

In the present study of 30 cases, 20 cases (66.66%) were males, and 10 cases (33.33%) were females.

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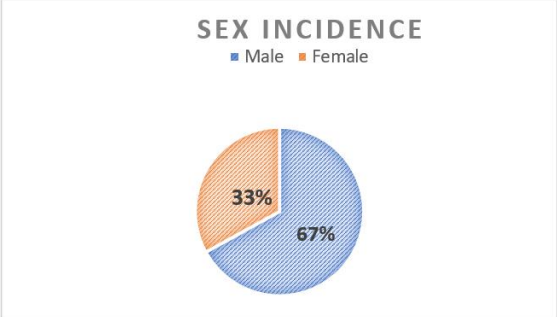

Figure No 1: Percentage of subjects in the study according to sex

2.**Age incidence**
The maximum number of cases belongs to 41-50 years age group, i.e., 12 cases (40.0%), followed 31-40 years age group, i.e., 8 cases (27%).

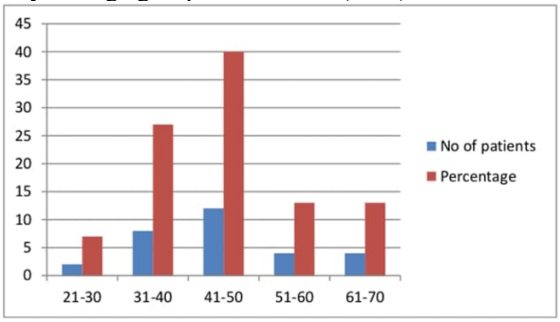

Fig 2-Age incidence among study

3.**Side incidence**
The right side incidence was 60% and the left side incidence was 40%.

4. **Mode of injury**
22 cases were sustained injury due to road traffic accident; 4 cases due to fall from height; and the remaining patients sustained injury due to trivial fall(osteoporosis)

5. **AO classification**[3]
Among 30 cases, according to AO classification, a total of 18 cases (61.0%) belongs to A1 type, 4 cases (13.0%) each of A2 type, A3 type, and C type of distal femoral fractures.

6. **Fracture types**
In the present clinical study 28 cases (93%) were simple fractures, and 2 cases (7%) were compound fractures of Gustilo-Anderson Type - 1.

7. **Fracture union**
Fracture union was achieved by 16 weeks in 20 cases (66.6%) and the remaining 10 cases took 16-20 weeks (33.3%) for union.

Time for union	No of patients	Percentage
<16 weeks	20	66.66
>16 weeks	10	33.33

Table no 1: fracture union

8. **Knee range of movements.**
At the end of 10 months follow up, 22 cases (73.22%) achieved ≥ 110°, 4 cases (13.22%) achieved 91°-109°, and 4 cases (13.22%) achieved ≤ 90° of knee flexion.

9. **Functional outcome**
Functional outcome was excellent to good in 80% of the patients based on Lysholm knee score, followed by good and fair outcome in 10% each.

Composite Scores	Number of Patients	Percentage(%)
Excellent(95-100)	24	80
Good (84-94)	3	10
Fair(65-83)	3	10
Poor(<65)	0	0
Total	30	100

Table no 2: Functional outcome.

10. Complications
Anterior knee pain was found during follow up period among 2 cases (6.7%), superficial infection was noted at the nail insertion site in 2 case (6.7%), and no incidence of deep infection.

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Preoperative x rays and 3D CT reconstruction images

Fig no-3 Preoperative x rays

Fig no-4 Preoperative 3DCT reconstruction images

Fig no-5 Intraoperative C arm images

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Fig no-6 Immediate Postoperative x rays

Fig no-7 Follow up images showing knee range of movements

IV. Discussion

Despite the advancements in internal fixation, supracondylar fractures of the femur challenges every Orthopaedic surgeon to achieve and maintain an adequate reduction and overall limb alignment. This serious injury had the potential risk to produce long term disability. Supracondylar femoral fractures typically follow a bimodal distribution in terms of injury mechanism: (1) high-energy trauma in younger individuals, often leading to comminuted and open fractures, and (2) low-energy trauma in elderly patients, usually associated with osteopenic or osteoporotic bone[4,5]

Retrograde IMN, has the edge of being biological, not disturbing fracture hematoma because of indirect reduction, less soft tissue handling, and no loss of blood supply to the bone as periosteum is left intact. Nailing provides favorable IM stability and can be successfully implanted on multisegmental fractures of the lower extremity. In addition, a variety of distal femur fractures ranging from AO type A-extra articular metaphyseal, as well as intra articular type C fractures can be stabilized.

In these fractures, retrograde IM nailing can be used and closed indirect fracture reduction is achieved by inserting the nail at a correct insertion point leaving the soft tissue envelope intact. Intra-artinular type C fractures may also be treated with the retrograde nail after proper reduction and anatomical reconstruction of the articular surface sing multiple k wires or cannulated cancellous screws. In the current study, male to female ratio was observed 2:1 with a mean age of 50 years, road traffic accidents were the main cause of injury, with right side predominance. The majority of the fractures were simple, and type A was the common type of fracture. The average operating time in our series was 80.5 minutes. Fracture union has occurred on an average between 14-16 weeks, and functional outcome was excellent to good in 80% of the patients based on Lysholm knee score.

The most common complication and limiting factor in retrograde nailing remain as Anterior knee pain may be due to prominent hardware which can be managed by early removal of implants after bone remodeling and oral analgesics for symptomatic relief.

The present study has shown good functional outcomes and less complication rates compared to other studies in the current era. Thus

establishing retrograde nailing is the best method of treating supracondylar fractures of the femur.

V. Conclusion

Retrograde Intramedullary nail will have its permanent place in the armamentarium for the treatment of supracondylar femur fractures, provides rigid internal fixation for rapid healing of supracondylar fractures with a comparable functional outcome to load bearing devices with minimal soft tissue dissection. Adequate reconstruction of the articular surface is of paramount importance in fractures with intraarticular extension, Fixation with no malalignment of the nail, less soft tissue injury, good articular reconstruction, and early physiotherapy yields good results.

VI. Limitations

A probable limitation of this study was its smaller size. Some observations like loss of reduction, implant failure, a second surgery etc. were not found to be statistically significant in our study, but are noted in many other studies probably due to the smaller size of this study.

References

[1]. Court-Brown CM, Caesar B. Epidemiology of adult fractures: a review. Injury. 2006; 37:691-97

[2]. Lysholm J, Gillquist J. Evaluation of knee ligament surgery results with special emphasis on use of a scoring scale. Am J Sports Med 1982; 10: 150-4

[3]. Fracture and dislocation compendium. Orthopaedic Trauma Association Committee for Coding and Classification. J Orthop Trauma. 1996;10(Suppl 1:vix):1-154

[4]. Ng AC, Drake MT, Clarke BL, Sems SA, Atkinson EJ, Achenbach SJ et al Trends in sub trochanteric, diaphyseal, and distal femur fractures, 1984-2007. Osteoporos Int. 2012 Jun; 23(6):1721-726

[5]. Martinet O, Cordey J, Harder Y, Maier A, Buhler M, Barraud G. The epidemiology of fractures of the distal femur Injury. 2000; 31(3):C62-3.