Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

A prospective study to evaluate functional outcome in patients with fracture distal femur treated with retrograde intramedullary nailing and locking compression plating

Deepak Singh Rajput[1], Ankur Bansal[2]*

[1]Assistant Professor, Department of Physical Medicine and Rehabilitation, MGM medical college, M.Y Hospital, IndoreMadhya Pradesh, India

[2]Senior resident, Department of Orthopaedics, MGM medical college, M.Y Hospital, Indore Madhya Pradesh, India

Correspondence author-Dr. Ankur Bansal

Abstract

Introduction: With rapid industrialization and modernization rate of road traffic accidents has also increased concomitantly which has inadverantly increased rate of musculoskeletal injuries. In all these injuries supracondylar femur fracture contributes 1% of all the fractures and 3-6% of all femur fractures. In young patients the main reason is due to high energy trauma whereas in elderly this occurs due to trivial trauma attributed to osteopenia. Despite of various treatment modalities these fractures still possess a great challenge in front of orthopaedics surgeons

Method & Material: we conducted the study from March 2021 to Feb 2022 on 25 patients arrived at M.Y hospital emergency room with 13 of them treated with RN, while 12 are treated with locking plate. Patients were followed up for 6 months. Muller classification system was used to classify this fracture with only type A1-3 were taken into consideration.

Results: KOOS scoring system was used to evaluate final outcome at the end of 6 months follow up which demonstrated that in RN group 3 cases were excellent, 7 were good, 2 were fair while 1 was poor. In LP group 2 were excellent, 4 were good, 4 were fair while 2 were poor. Over 90% fracture healed before 6 months with average time of union for RN and LP group being 17 weeks and 21 weeks respectively.

Conclusion: Retrograde nailing and plating both provide an excellent means of treating such fracture. Early fracture healing, less intraop blood loss, less operative time were some advantages beared by RN group but it was also associated with more incidence of anterior knee pain. Both

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

the method allows fracture healing with statistical significance. However, this difference was seen in both the group can be explained as more complex/communited fractures were treated with plating. At last, both the procedure requires proper planning and execution so as to get desirable result

Key words: RN- retrograde nailing, LP- locked plating, KOOS- knee injury osteoarthritis severity score

Introduction

These complex injuries and many a time involve articular surface and hence its treatment by surgical means becomes important. Most of the trauma are associated with high energy mechanism while some of them have other associated causes such as osteoporosis, simple cyst etc. Males are more commonly affected than women. Significant advance method has been developed to treat such complex trauma.

As this makes the path for weight bearing hence fracture of distal femur should be managed with device fixation with restoration of knee joint anatomy and biomechanics. Many devices have been introduced to help to maintain fixation and reduction of the fracture. While dealing such fractures surgeon should avoid excessive soft tissue stripping, initiate early joint ROM while maintaining the reduction.

Lateral plating offers a mode of good and rigid construct but requires excessive soft tissue stripping and significant blood loss which delays patient recovery and adds to complication. Alternatively intramedullary nailing offers potential benefit over plating as they can be introduced through small incision and thereby reducing overall patient morbidity. Additionally, it's a load sharing device in respect to plating which is a load bearing device which again helps in early mobilization of patient. Antegrade nailing has a disadvantage of less rigid fixation as it creates angular deformity or sometimes implant failure when patient is tried to mobilize. To address this disadvantage of antegrade nailing Green, Seligson and Henry deviced retrograde supracondylar nail in year 1998.

In this prospective study we will compare and evaluate the outcome of distal femur fracture both clinically and radiologically using retrograde nailing (RN) and Locking Compression plate (LCP) technique. In addition, functional outcome will also be compared using Knee Injury Osteoarthritis Outcome score (KOOS).

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

Aims & Objective

To compare and evaluate the functional, radiological & clinical outcome for patients with fracture extra-articular distal femur treated with retrograde nailing vs locking compression plate and look for associated complications.

Method & material

Our study was conducted in 25 patients with extra articular fracture distal femur fractures presented to the M.Y hospital emergency room from march 2021-feb 2022.

Inclusion criteria

1. All Muller type A patients
2. Age 20-50 years
3. Presented within 3 weeks of injury with no ipsilateral limb injury
4. Gustilo Anderson Grade 1 compound fractures

Exclusion criteria

1. Associated comorbidities such as Diabetes, CVA etc
2. Neurovascular injury of ipsilateral limb

Fig 01: Fracture supracondylar femur in a 22 year old male patient.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

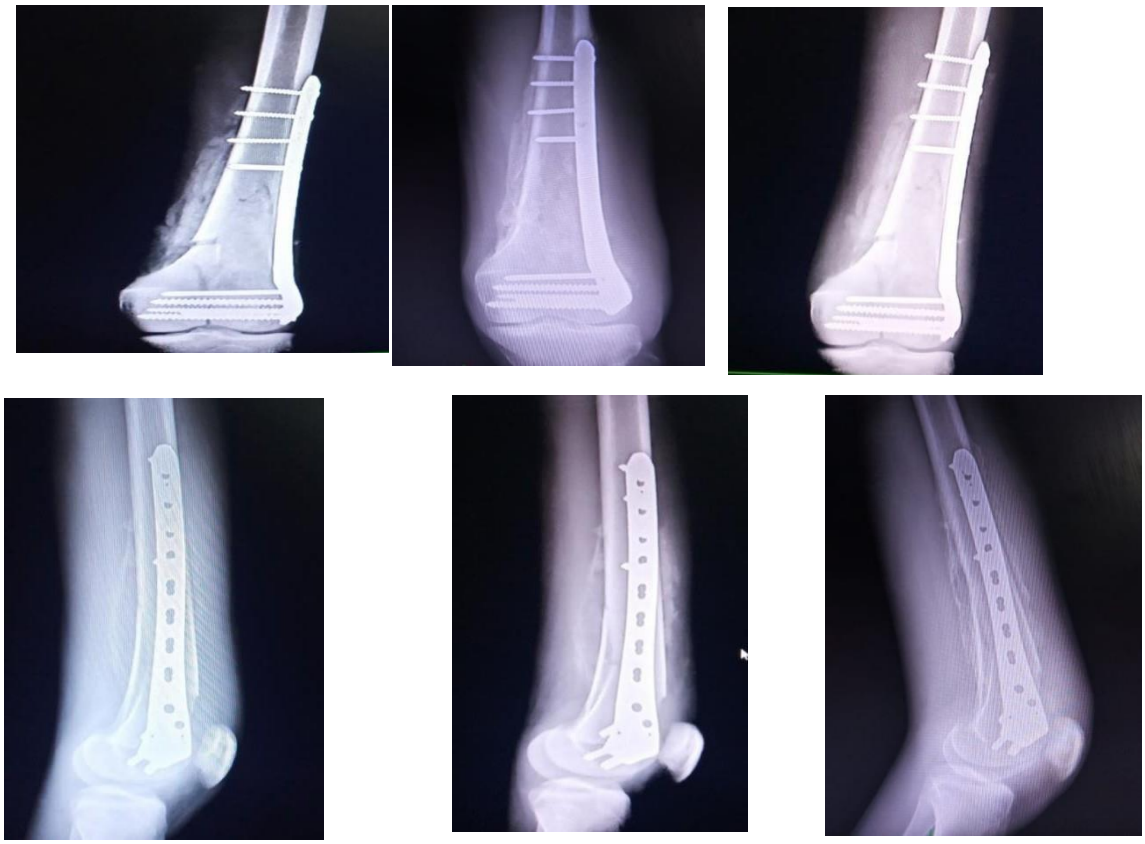

Fig 02: 6 weeks, 12 weeks and 24 weeks follow up AP and lateral radiographs of the same patient. Significant union can be seen on the 12 weeks follow up. This patient scored 79 points by the knee injury osteoarthritis outcome score system which suggests a ‘Good’ outcome

Fig 03: Fracture supracondylar femur in a 54 year old male patient

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

Fig 04: 6 weeks, 12 weeks and 24 weeks follow up AP and lateral radiographs of the same patient. Significant union can be seen on the 12 weeks follow up. This patient scored 90 points by the knee injury osteoarthritis outcome score system which suggests an 'excellent' outcome.

Post operative protocol

- Post-operatively patient limb was kept elevated for swelling over well padded BB splint. On post op day 2 check dress was done.
- Passive knee ROM on bed started on POD 2 as per patient pain tolerance
- Suture removal was done after 2 weeks with tip toe touch walking started concomitantly
- Full weight bearing as per patient's pain tolerance

Patients were followed up every month till 6 months

Statistical analysis

Done using p value. P-value of <0.05 was considered statically significant.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

Observation & results

1. Age distribution

Age group	No. of patients
20-30	11
31-40	9
41-50	5

2. Sex distribution

Group	Male	Female	Total
Retrograde IM nailing	8	5	13
Locking plate	9	3	12
Total	17	8	25

3. Laterality

Group	No.of patients
Left	11
right	14

4. Mode of injury

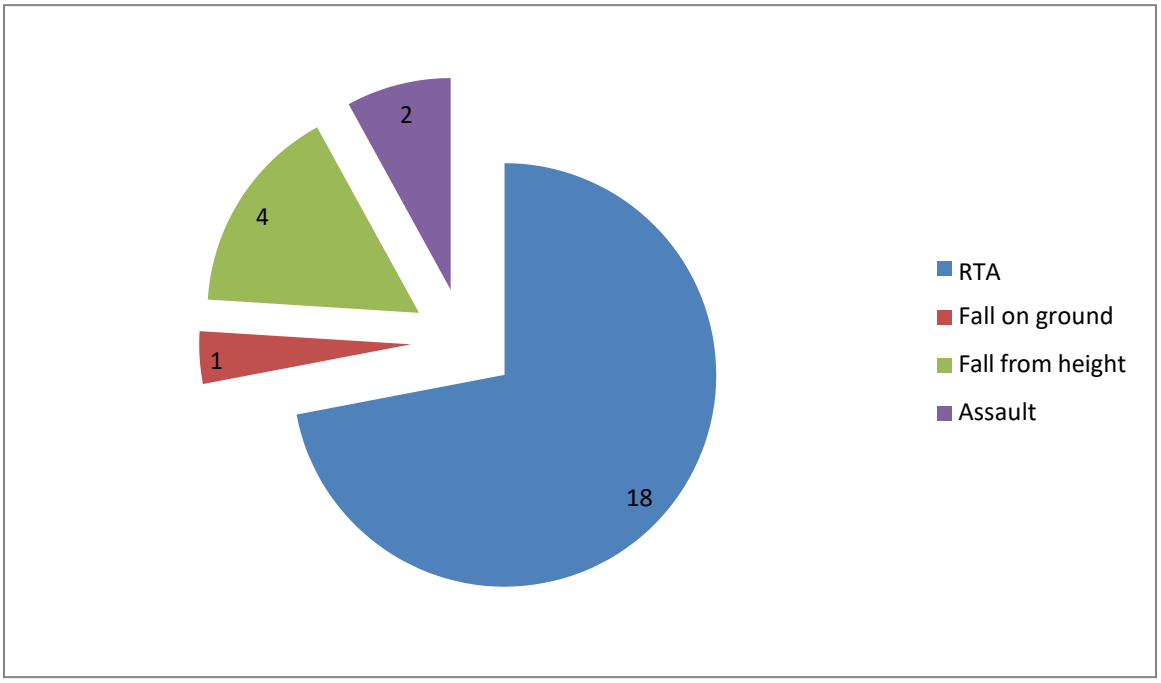

Fig 06: Mode of Trauma

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

5. Operating time, Mean operative time (minutes) between two groups

Group	Mean +/- SD
Nailing	56.28+/- 6.35
Plating	104 +/- 5.54

P value= <0.0001 which is statistically significant

6. Union time, Mean union time (weeks) between two groups

Group	Mean +/- SD
Nailing	17.0 +/- 2.2
Plating	21.21 +/- 3.4

P value= 0.0012 which is statistically significant

7. KOOS score, Score at the end of 6 months

KOOS score	Nailing	Plating	Total
Excellent	3	2	5
Good	7	4	11
Fair	2	4	6
Poor	1	2	3
Total	13	12	25

8. Complication

S.no	Complication	RN group	LP group
1	infection	0	1
2	Joint stiffness	1	2
3	Knee pain	3	1
4	Delayed union	0	2

Discussion

Fracture of distal femur are fracture of necessity and have to be managed surgically as it can produce long term morbidity if not treated properly. Anatomic reduction with minimum soft tissue stripping with a stable construct should be the goal while treating this fracture. With these factors retrograde intramedullary nailing provides an excellent choice of implant to a surgeon as it requires a small incision, less operative time, early mobilization.

In our study of 25 patients of fracture distal femur extra-articular underwent retrograde nailing and locking plating. Mean age of occurrence of fracture was found to be 29.8 years. Sex distribution was found to be comparable in both groups. Most common means of injury is RTA

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

which was found to be similar with other studies. This study shows a definite male preponderance in our study (68%) as same showed in the study by Seifert et al[(1)] (60%) .

Mean operating time in our study was found out to be 56 minutes for RN while 104 minutes for plating counting from incision time which was found to be significant. Mean union time for RN group was found to be 17 weeks while for plating group it was found out to be 21 weeks as compared to Seifert et al [(1)] were mean time was 12.6 weeks, G Papadokostakis[(2)] were mean union time was 3.4 months.

In our study 1 case of superficial infection in Plating group was present as compared to none in nailing group. This patient was treated with serial dressing and debridement with antibiotics support. In total 3 patients presented with knee joint stiffness with 1 in RN group while 2 in LP group. 2 were managed by vigorous physiotherapy while 1 patient was taken for manipulation under general anaesthesia. 3 patients of RN group and 1 patient of LP group presented with anterior knee pain and was managed with Nsaids and reassurance. Same complication was seen in a study by Lauri Handolin et al[(3)].

In this study of 25 patients, 16 patients have good to excellent result (64%) while 3 patients showed poor result (12%) against the study of Gellman et al[(4)] which showed 80% of good result. The main problem encountered during the study was non-compliance of patients towards physiotherapy leading to decreased range of motion.

Conclusion

Extra-articular distal femur fracture is a complex trauma which need immediate surgical intervention with early mobilization so as to decrease morbidity associated. Both retrograde intramedullary nailing and locking compression plating provide an excellent fixation when used properly. With nailing less operative time, less intraoperative blood loss, early ROM of knee are the benefits but it is also associated with post operative anterior knee pain. It also gives an excellent choice of implant in case of pathological fractures. Both the techniques show fracture union but the difference in union time in both was statistically significant being early for nailing group. However, both the techniques require surgical expertise and proper planning.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE07, 2022

Reference

1. Seifert J, Stengel D, Matthes G, Hinz P, Ekkernkamp A, Ostermann PA. Retrograde fixation of distal femoral fractures: Results using a new nail system: J OrthopTrauma. 2003; 17(7):488-495.
2. Papadokostakis G, Papakostidis C, Dimitriou R, Giannoudis PV. The role and efficacy of retrograding nailing for the treatment of diaphyseal and distal femoral fractures: A systematic review of the literature: Injury, 2004, 814-822.
3. Handolin L, Pajarinen J, Lindahl J, Hiravensalo E. Retrograde Intramedullary nailing in distal femoral fracture Results in a series of 46 consecutive Operations: Injury. 2004; 35(5):517-522.
4. Gellman R, Paiement G, Green H. Treatment of supracondylar femoral fractures with a retrograde intramedullary nail: Clinical orthopaedics and related research. 1996; 332:90-97.