



E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2020; 6(4): 983-986
© 2020 IJOS
www.orthopaper.com
Received: 28-09-2020
Accepted: 13-10-2020

Dr. Syed Mohsin
Assistant Professor, Department of Orthopedics, Hassan Institute of Medical Sciences, Hassan, Karnataka, India

Dr. Ajith Kumar KS
Assistant Professor, Department of Orthopedics, Hassan Institute of Medical Sciences, Hassan, Karnataka, India

Dr. Sreeranga N
Professor and Head, Department of Orthopedics, Hassan Institute of Medical Sciences, Hassan, Karnataka, India

Retrospective study of clinical profile and outcome of patients with distal femoral fractures managed by retrograde nail in a tertiary care hospital

Dr. Syed Mohsin, Dr. Ajith Kumar KS and Dr. Sreeranga N

Abstract

The distal third femoral fractures constitute 6% of all femoral fractures. These fractures pose a great challenge in management due to the involvement of soft tissue injury, intra-articular extension, and injury to the extensor mechanism [1]. They have bimodal age distribution; in the older population who are already osteoporotic distal femoral fractures occur predominately after low-energy trauma like falls and sprain injuries and have complications associated with comorbidities. In young patients high-energy trauma causes complex injury with comminuted and open fracture pattern. Many patients also suffer polytrauma, soft tissue injury, ligament or meniscal tears, dissected cartilage fragments and patellar fractures [1, 2, 3]. Methods of treatment vary according to type, level of fracture and age of patient and are based on assessment of advantages and disadvantages associated with each. Although the fracture management of distal femur continues to evolve, surgery has become the standard of care for displaced fractures and for patients to obtain rapid return of knee function [4, 5]. The distal third femoral fractures are best treated with open/closed reduction and surgical stabilization with load sharing or load-bearing implants [6]. The current method of open reduction and internal fixation has become evident in the recent years with good results being obtained with the AO blade plate, dynamic condylar screw, intramedullary supracondylar nail and locking compression plate [6, 7]. While there still revolves a lot of controversy around the treatment of choice for these type of fractures, we aim to do a retrospective study of the clinical profile of the patients with distal femur fractures have an impact on the treatment outcome with the retrograde nailing.

Keywords: Distal Femoral fracture, DFLP, RTA, Supracondylar nail, retrograde nail, DFN

Introduction

Distal femur fractures account for about 7% of fractures in adults. Surgical management should be aimed at gaining early weight bearing and mobilization in order to avoid the complications of prolonged bed rest [1]. Our study compares the surgical outcome between distal femoral locking plates (DFLP) and retrograde nailing in management of distal femoral fracture. Fractures in the elderly are often challenging due to osteoporotic bone and comorbidities and long term disability can occur [2]. Surgery is the standard mode of treatment and hence a quick surgical treatment for early weight bearing and mobilization is required in order to prevent long term complications due to prolonged bed rest.

Methodology

A retrospective study of 20 patients with distal femur fracture managed by retrograde femoral nail was carried out in Hassan Institute of Medical Sciences, Hassan from January 2017 to January 2019. A total of 20 patients were included with predetermined inclusion and exclusion criteria in this study treated with retrograde nailing. All patients were documented retrospectively, complete demographic details and clinical history were obtained. Clinical and radiographic evaluation was done in all the patients. Informed consent was taken and all patients were treated with retrograde nailing. Duration of hospitalization was documented and follow up was done for 2 years.

Inclusion criteria were closed distal femur fractures A1, A2, A3 types of Orthopaedic Trauma Association (AO/OTA) classification, patients of age 18 yrs and above both male's and females and patients with comorbid diseases like controlled diabetes mellitus, hypertension, asthma, epilepsy and other medical conditions with closed distal femoral fractures.

Corresponding Author:

Dr. Syed Mohsin
Assistant Professor, Department of Orthopedics, Hassan Institute of Medical Sciences, Hassan, Karnataka, India

Exclusion criteria were Compound fractures of distal femur, Closed distal femur fractures B1, B2, B3, C1, C2 and C3 types of Orthopaedic Trauma Association (AO/OTA)classification, pathological fractures, peri-prosthetic fractures, Patients of age group < 18years and Patients unfit for surgery.

A thorough clinical examination and x-ray of the fracture site of the femur along with hip and knee joint was taken. CT scan was a part of the operative work up in cases with intra articular extension.

All fractures were classified based on AO/OTA classification.

Type / Description

A) Extra articular

- A1 Simple (two-part)
- A2 Metaphyseal wedge
- A3 Metaphyseal complex (comminuted)

B) Partial articular (unicondylar)

- B1 Lateral condyle (fracture in the sagittal plane)
- B2 Medial condyle (fracture in the sagittal plane)
- B3 Frontal (fracture in the coronal plane)

C) Complete articular (bicondylar)

- C1 Articular simple and metaphyseal simple (a T or Y pattern)
- C2 Articular simple and metaphyseal multi fragmentary
- C3 Multi fragmentary articular

Before surgery the necessary laboratory investigations (Hb%, WBC, TC, DC, ESR, RBS, Blood Urea, Serum creatinine, HIV-I & II, HbSAg) along with ECG were done and medically fit patients were operated with retrograde nailing within 5 days of initial trauma.

On follow up, work up was done and the results were interpreted by Neer's criteria.

Operative technique

Under regional or general anaesthesia under all aseptic precaution the parts are painted and draped, with knee in 90degree of flexion. Midline approach incision is taken of about 3cm from the inferior pole of patella to the tibial tuberosity. Incision is deepened along the direction of fibres of patellar tendon, after splitting them access is gained into the intercondylar notch of the femur, palpating the femoral attachment of posterior cruciate ligament, awl is positioned in such a way that it just lies in front of it which is confirmed by image intensifier in antero-posterior and lateral planes. Entry point is made just above the Blumensaat's line and subsequently guide wire is passed through it. After achieving the reduction of the fracture under image, guide wire is introduced in the proximal fragment following which the medullary canal is reamed with a canulated reamer. A distal femoral nail of appropriate length and diameter is mounted on a jig and is introduced over the guide wire after checking for the reduction and nail fitting in the canal proximal locking is done with 4.5mm screws after drilling through the stab incision to the corresponding marking on the jig through the sleeve. Similarly through the stab incision distally, the sleeve is flushed through the fenestrations of the jig to the lateral cortex and drilled up to the medial cortex. The suitable sized (4.9mm) locking bolt length of which is determined by the depth gauge and the subsequent screws are locked in the similar manner. After thorough wash the paratenon of the patellar tendon is repaired and the wound is closed in layers. Sterile dressing and compression is applied. Post operatively limb elevation, pain management and infection control with

IV antibiotics are given.

Knee and hip mobilization with static quadriceps exercise is started from postoperative day 1 motivating the patient to walk with crutch or walker with strict non weight bearing and patient is discharged on 3-5 postoperative day.

Suture removal is done on 12th postoperative day.

Patient is followed up on 3 weeks, 6 weeks and 3 monthly until fracture union. Partial to full weight bearing from 6 weeks onwards is recorded depending upon the union of fracture. At every follow up visit patient is assessed for clinical and radiological union with the various parameters like pain, absence of mobility at the fracture site, warmth, radiographic alignment, callus, shortening and stiffness of the joint. Clinically fracture union is defined as no pain, warmth or mobility at the fracture site and no discomfort on the weight bearing.

Post-operative management

- The operated limb elevated
- Any neurovascular deficit was checked.
- Appropriate antibiotics and analgesics used.
- Mobilization with non-weight bearing with the help of crutches/walker was advised.
- Patients discharged on advice to come for regular follow-up.
- For all patients immediate post-operative radiographs taken to determine the maintenance of the reduction on radiographs.

Follow-up

- Suture removal is done on 12th postoperative day and follow up is done on 3 weeks, 6 weeks and 3 monthly until fracture union.
- Active range of motion exercises are encouraged from 1st post-operative day.

The patients are examined clinically and radiologically and assessed for range of motion, callus formation, fracture union and accordingly weight bearing is advised from toe touch to full weight bearing.

Results

In our hospital we studied 20 patients retrospectively which were treated with retrograde nailing. The following were the observations and results in our study:

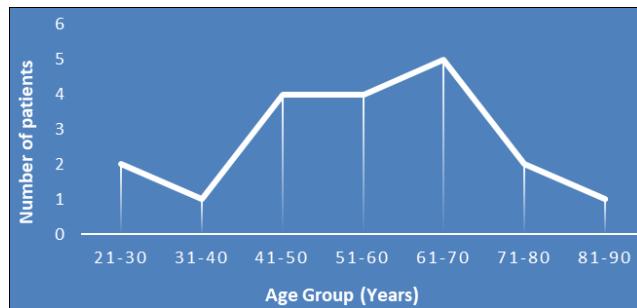
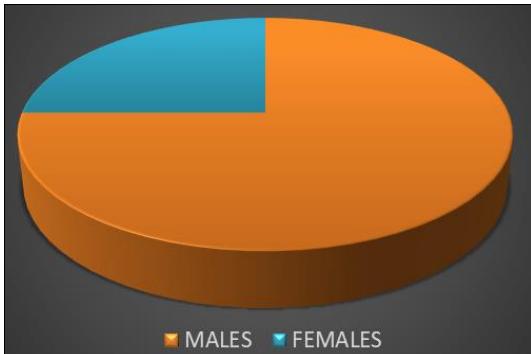
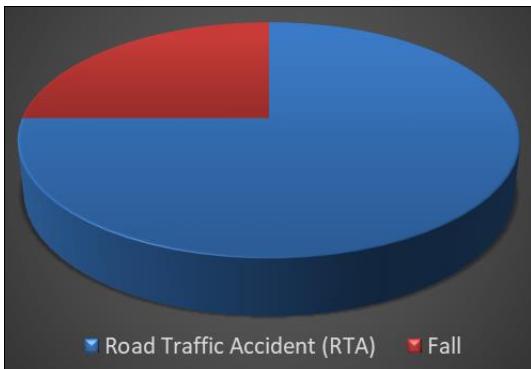
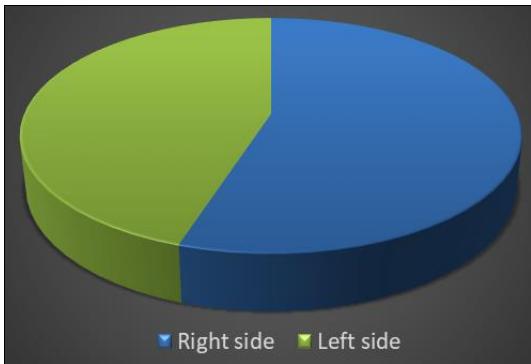
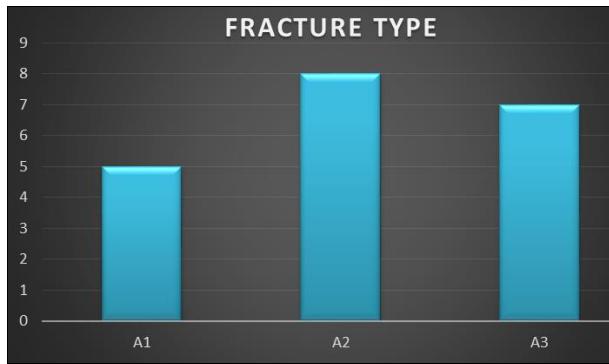


Fig 1: Age distribution

**Fig 2:** Gender distribution**Fig 3:** Mode of injury**Fig 4:** Side involvement**Fig 5:** Type of the fracture according to AO classification

Majority of the patients of both the study groups belonged to the age group of 61 to 70 years. Mean age group was 52.25years. 75 percent of the patients of the retrograde nailing group were males and 25 percent were females. Road traffic accident (RTA) was the mode of injury in 75% of patients and 25% had a trivial fall. 55 percent of the patients had right sided injury and left side involvement was seen in 45 percent had injury to left hip. A2 were the major types of fractures followed by A3

according to AO classification.

Discussion

Fractures in the distal femur have posed considerable therapeutic challenges throughout the history of fracture treatment. The outcome of patients managed by retrograde nailing often included both young patients with high energy fractures like RTA and elderly patients with osteoporotic fractures with trivial falls. However, it is now understood that the two groups require a separate analysis due to the differences in patient and fracture characteristics [3, 4]. Hence, our study was undertaken for the treatment outcome of retrograde nailing in management of distal femoral fracture. Majority of the patients of both the study groups belonged to the age group of 61 to 70 years as opposed to Shyam *et al.* where patients of both the study groups belonged to the age group of 51 to 60 years. In our study 75 percent of the patients of the retrograde nailing group were males, where as in their study it was 73.33%. Right side involvement occurred in 55 percent of the patients of the retrograde nailing group respectively comparable with Shyam *et al.* which 60 % in each group respectively.

In our study, Road traffic accident (RTA) was the mode of injury in 75% and 25% had a trivial fall whereas road traffic accident accounted for 56% of cases in Julai *et al.*, Gellman *et al.* and Schatzker *et al.* observed 63 % and 58 % of their cases respectively having trauma as their cause [7, 8].

Conclusion

A2 was the major types of fractures according to AO classification retrograde nailing.

References

1. Prasanna A, Jeyaraman M, Chaudhari K, Ajay SS, Sabarish K *et al.* Prospective Study on Functional Outcome of Retrograde Femoral Nailing in Distal Third Femoral Fractures. *J Clin Exp Orthop* 2019;5(2):65.
2. Kolmert L, Wulff K. Epidemiology and treatment of distal femoral fractures in adults. *Acta Orthop Scand* 1982;53:957-962.
3. Jillala SR, Ahmed SMW, Shruthi A, Gajul R, Katikitala A, Rakesh K. A Comparative Study of Supracondylar Nail versus Locking Compression Plate in Distal Femur Fractures. *Ann. Int. Med. Den.1 Res* 2017;3(4):OR35-OR41.
4. Martinet O, Cordey J, Harder Y, Maier A, Bühler M, Barraud GE. The epidemiology of fractures of the distal femur. *Injury* 2000;31(3):C62-C63.
5. Ehlinger M, Ducrot G, Adam P, Bonnomet F. Distal femur fractures. Surgical techniques and a review of the literature. *Orthop Traumatol Surg Res* 2013;99(3):353-60.
6. Hartin NL, Harris I, Kaushik H. Retrograde nailing versus fixed angled blade plating for supra-condylar femoral fractures: A randomized controlled trial. *ANZ J Surg* 2006;76:290-294.
7. Lupescu O, Nagea M, Patru C, Vasilache C, Popescu GI, *et al.* Treatment options for distal femoral fractures. *Maedica J Clin Med* 2015;10:117-122.
8. Shyam Mohan, Shashank Jindal. Comparison between DFLP and Retrograde Nailing in Management of Distal Femoral Fracture at a Tertiary Care Centre. *Int J Med Res Prof* 2018;4(6):334-37. DOI:10.21276/ijmrp.2018.4.6.078.
9. Gurkan V, Orhun H, Doganay M *et al.* Retrograde

- intramedullary interlocking nailing in fractures of the distal femur. *Acta Orthop Traumatol Turc* 2009;43(3):199-205. Doi:10.3944/AOTT.2009.199
10. Virk JS, Garg SK, Gupta P, Jangira V, Singh J, Rana S. Distal Femur Locking Plate: The Answer to All Distal Femoral Fractures. *J Clin Diagn Res* 2016;10(10):RC01-RC05
 11. Kumar SK, Ghosh A *et al.* Short term evaluation of distal femoral fracture fixation by locking plate. *Annals of International Medical and Dental Research* 2017;3(4):15-9.
 12. Gellman RE, Guy D Paiement, Green HD. Treatment of supracondylar femoral fractures with a retrograde intramedullary nail. *CORR* 1996;332:90-97.
 13. Hierholzer C, Ruden CV, Potzel T, Woltmann A, Buhren V, *et al.* Outcome analysis of retrograde nailing and less invasive stabilization system in the distal femoral fractures, retrospective analysis. *Ind J Ortho* 2011;45:243-250.
 14. Christodoulou A, Terzidis I, Ploumis A, Metsovitis S, Koukoulidis A, Toptsis C. Supracondylar femoral fractures in elderly patients treated with the dynamic condylar screw and the retrograde intramedullary nail: a comparative study of the two methods. *Arch Orthop Trauma Surg* 2005;125:73-9.
 15. 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* 2005;36:813-22.
 16. Tucker MC, Schwappach JR, Leighton RK, Coupe K, Ricci WM. Results of femoral intramedullary nailing in patients who are obese versus those who are not obese: a prospective multicenter comparison study. *J Orthop Trauma* 2007;21:523-9.
 17. El-Kawy S, Ansara S, Moftah A, Shalaby H, Varughese V. Retrograde femoral nailing in elderly patients with supracondylar fracture femur; is it the answer for a clinical problem? *Int Orthop* 2007;31:83-6.
 18. Chin KR, Altman DT, Altman GT, Mitchell TM, Tomford WW, Lhowe DW. Retrograde nailing of femur fractures in patients with myelopathy and who are non-ambulatory. *Clin Orthop Relat Res* 2000;(373):218-26.
 19. Dileep KS, Mahesha K. Retrograde intramedullary nailing for fractures of distal femur: A prospective study. *Int J Res Orthop* 2016;2:76-279.
 20. Gupta SKV, Govindappa CVS, Yalamanchili RK. Outcome of retrograde intramedullary nailing and locking compression plating of distal femoral fractures in adults. *OA Orthopaedics* 2013;1:23.