



ANALYSIS OF SUPRACONDYLAR FRACTURES OF FEMUR TREATED BY LOCKING PLATE FIXATION

Orthopaedics

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ABSTRACT

Introduction: Supra condylar femoral fracture has multiple treatment options and may have different complications including wound infection, delayed or nonunion. One of the recent techniques is Distal femoral locking plate which is a minimal invasive technique. **Methodology:** This descriptive study was carried out in Orthopaedics Department of Government medical college, Suryapet on 28 patients from August 2020 to July 2021. All the patients who sustained closed supra-condylar fractures of distal femur and falling under Muller Type-A were included. Those presenting within 24 to 48 hours of injury and between 20-50 years of age were included in the study. MIPO technique was used for surgical treatment in these cases. Union was assessed at follow up. SPSS v.20 was used to analyse data. **Results:** There were total 28 patients in this study; the mean age of the patients was 36.4 years. There were 19(68%) male and 9(32%) female. The mean hip flexion for operated limb was 126° and the mean knee flexion for operated limb was 124°. At 36 week follow up all 28(100%) patients presented with grade-I radiological union i.e. formation of homogenous bone structure. **Conclusion:** Distal femoral locking plates resulted in favourable outcomes on short-term basis for treating supra-condyle fractures of distal femur Muller A in terms of union and range of motion at knee and hip joint.

KEYWORDS

Femur, Fracture, MIPO, Supracondylar

INTRODUCTION:

Femur is the longest and strongest bone in the body which is surrounded by large muscles. Distal femur is the commonest region of fractures especially in the younger population encountering high velocity trauma¹. Supra condylar part of femur is much weaker than the shaft of the femur and hence variety of fracture patterns are identified².

There are many methods of treatment advocated for the supracondylar fractures of the femur in the literature. Condylar blade plate and dynamic condylar screw provided decent results but need good bone stock and are not suitable for osteoporotic fractures as minimal invasive methods became more attractive^{3,4}. Latest methods like biological methods with soft tissue preservation and hematoma sparing showed fewer rates of complications⁵. Internal fixation using Distal femoral locking plates is as minimal invasive technique gaining popularity lately^{6,7}.

Locking distal plate is an excellent treatment option but shorter length of plate, less number of screws and inadequate bridging can lead to complications and failure⁸. Locking distal femoral plate provides stable construct, helps to avoid infection, non-union and varus knee deformity encountered with conservative methods or other treatment options^{9,13}.

The objective of this study is to determine the outcome of locking plate in supra-condylar fractures of distal femur by minimal invasive plate osteosynthesis (MIPO) and to study union and range of motion at knee and hip joints.

METHODOLOGY

This descriptive case series was carried out Orthopaedics Department of Government medical college, Suryapet on 28 patients from August 2020 to July 2021 by calculating the sample size with convenient sampling formula keeping the confidence level to 95% and the margin of error to 10%. Each patient was followed up to minimum of nine months.

All the patients suffering from closed supracondylar fractures of distal femur Muller Type-A, presenting within 24 to 48 hours of injury, of age between 20-50 years were included in the study. Patients with open fractures, intra-articular fractures, poly-trauma, and patient with previous surgery of the same limb were excluded from the study. All the patients were received in the casualty and emergency and initial resuscitation was done. Injection Cefazoline 1G was given intravenously as prophylaxis post-operatively. The limb was

anaesthetized with the help of spinal, epidural anaesthesia in all the cases.

Maximum time for tourniquet application was less than 90 minutes. A skin incision was given over the lateral aspect of the distal femur longitudinally at the level of the intercondylar notch. Fracture was reduced under fluoroscopy guidance. Following reduction, plates (with 4 to 12 holes) were slid in a distal-to proximal direction over the lateral aspect of the distal femur. The length of the plate was determined intra-operatively. At least 4 screws were used avoiding the joint line. Postoperatively, the operated limb was kept on a splint. Hip and knee mobilization and isometric quadriceps exercises were allowed at 1st postoperative day. Full weight bearing was allowed after the consolidation of the fracture radiologically. Patients were followed up for the next 9-12 months. Age, sex was noted and informed consent was taken. The patients were discharged next day after surgery. The follow up of the patients was done at 1st post-operative day, 2nd, 3rd, 4th weeks and at 6 week interval up to 9-12 months. The patients were assessed for the union and range of motion.

All the collected data was entered into SPSS v.20 software and analysed. Quantitative data like age (in years), time of union (in days) and range of motion for normal and operated knee and hip joints was recorded as mean values.

RESULTS

There were total 28 patients in this study, the mean age of the patients was 36.4 years, the minimum age was 20 years and maximum age was 48 years. Gender distribution of patients showed that there were 19(68%) males and 9(32%) females in the study. The mean hip flexion for normal limb was 134°. The mean hip flexion for operated limb was 126°. The mean knee flexion for normal limb was 135°. The mean knee flexion for operated limb was 124°. The mean hip extension for normal limb was 34°. The mean hip extension for normal limb was 28°. The mean knee extension for normal limb was 0°. The mean knee extension for operated limb was 0°. At 36 week follow up all 28(100%) patients presented with grade-I radiological union i.e. formation of homogenous bone structure.

DISCUSSION

There were 68% males and 32% females in the current study and comparable with another study conducted in 2014 where 70% of the patients treated 14 were males and 30% were females. In the present series maximum age was 48 years. In most of the studies conducted internationally, older patients were treated with buttress or locking

plates^{4,13}. Union was achieved in 100 % of patients in the present study¹⁴. The average range of motion at knee was 124° in the present study. In another study 106° knee flexion was observed in closed fractures stabilized with locking compression plates¹⁵. No infection was detected in current study but in a study conducted in 2016, 4% of the total 50 patients suffered from superficial infection and 2% of the patients developed deep infection¹⁶.

A comparative study on 57 patients was conducted recently about supra-condylar nailing and distal femur locking plate which showed more complications in nailing group and union within 14 weeks in plating group with no much difference between both procedures on short-term basis¹⁷. Previous studies were not favourable regarding callus formation with locking plates¹⁸. Autogenous bone grafts or synthetic bone growth stimulants may be commonly used to fill the traumatic bone defects and non-unions. Locking plates provide strong and stable constructs which may lead to relative gap non-union and implant failure and hence needing primary bone grafts¹⁹.

CONCLUSION

Extra-articular distal femur fractures treated by locking plates combined with the Minimal Invasive Plate Osteosynthesis (MIPO) technique resulted in excellent outcomes, in terms of radiological union and range of motion at knee and hip joints.

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