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Original Research Paper



CLINICO – RADIOLOGICAL OUTCOME OF FEMUR DIAPHYSEAL FRACTURES TREATED WITH INTRAMEDULLARY INTERLOCKING NAILING

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ABSTRACT Background: Fracture diaphysis of a femur is one of the most common fractures that an orthopedic surgeon comes across. Since femur is one of the principal load bearing bones in the lower extremity, femur diaphyseal fractures resulting from high energy trauma, and are often associated with concomitant injury of internal organs. Thus these fractures are associated with considerable mortality and morbidity.

Results: In the present study, we used WINQUEST AND HANSENS CLASSIFICATION to classify the fractures, 14 (46.66%) cases were type 0 fractures; type1 fractures were 6 (21.33%). The age of the patients ranges from 18-70 years, with a mean age of 37.6 yrs. Male predominance was seen; about 76.66% (23 cases) were males and the rest females, i.e., 23.33% (7 cases). Eighteen cases (18) were right-sided, and twelve cases (12) were left-sided fracture diaphysis of the femur

KEYWORDS : femur shaft fracture , closed nailing, interlocking nail femur

INTRODUCTION

Fracture diaphysis of a femur is one of the most common fractures that an orthopedic surgeon comes across. Advance in mechanization and acceleration of travel are accompanied by an increase in the number and severity of fractures. Since femur is one of the principal load-bearing bones in the lower extremity, femur diaphyseal fractures resulting from high energy trauma, and are often associated with concomitant injury of internal organs 1. Thus these fractures are associated with considerable mortality and morbidity. The management of these fractures had advanced over time. From the use of externally applied splints in the ancient age to the advanced, sophisticated instrumentation in the recent period.

MATERIALS AND METHODS:

This is a Case series study conducted from December 2017 to June 2019. This will include patients of both sex and age group between 18-70 years, admitted in the orthopedic wards with diaphyseal fracture of Femur at maharajah institute of medical sciences nelimarla. All cases were followed for a period of 12 months. This study comprises of 30 cases of fracture diaphysis of femur admitted during the study period. Among the 30 cases,26 are closed type, 3 cases are type 1 compound, and 1 case was type2 compound.

RESULTS

This prospective study of 30 cases of fracture diaphysis of femur treated with intramedullary interlocking nail done in the Department of Orthopaedics, from November 2017 to June 2019. The age of the patients ranges from 18-70 years, with a mean age of 37.6 yrs. Male predominance was seen; about 76.66% (23 cases) were males and the rest females, i.e., 23.33% (7 cases). Eighteen cases (18) were right-sided, and twelve cases (12) were left-sided fracture diaphysis of the femur. Road traffic accidents were observed to be the leading cause of fractures in our case series, with 86.66% of cases (26 patients). In the present study, 24 (80%) cases were closed and 6 (20%) were open fractures. In the present study, we used WINQUEST AND HANSENS CLASSIFICATION to classify the fractures ,14 (46.66%) cases were type 0 fractures; type1 fractures were 6 (21.33%). For evaluation of results, Thoresen. B.O. Et al. (1985)(22) scoring system was used. The results were designated as excellent, good, fair, and Poor according to the alignment of the fracture, the range of motion of the ipsilateral knee, and the shortening of the femur, the degree of pain or swelling, and non-union.

Tuble 1. Thoresen's Officia.						
Thoresen's Criteria	Excellent	Good	Fair	Poor		
Malalignment of Femur (deg)						
Varus/valgus	0	5	10	>10		
Antecurvatum/Recu rvatum	5	10	15	>15		
Internal rotation	5	10	15	>15		
External rotation	10	15	20	>20		
Shortening of femur(cms)	1	2	3	>3		
Knee motion (deg)						
Flexion	>120	120	90	>90		
Extension deficit 1	5	10	15	>15		
Pain/Swelling	None	Minor	Significant	Severe		
Nonunion/Nail breakage	Absent	Absent	Absent	Absent		

Orthopaedics

Table 2: Functional outcome.

Functional	No Of Patients		Percentage
Out comes	Closed	Compound	
	Fractures	Fractures	
Excellent	21	1	73.33
Good	3	4	23.33
Fair	0	1	3.33
Poor	0	0	0



DISCUSSIONS

The treatment of fracture shaft femur has evolved from the old conservative management to the most recent methods of interlocking nails. Internal fixation of fractures of the femoral shaft has gained widespread acceptance as implants and technology have improved. Since then, unacceptable rates of malunion and non-union showed by various methods of

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conservative treatment has fallen dramatically. The rationale for internal fixation is that it restores the normal anatomical alignment and early mobilization of the patient.

Serial radiological assessment



The use of a plate to achieve osteosynthesis necessitates wide exposure and excessive soft tissue stripping, resulting in increased blood loss and operating time. The risk of infection is increased. Failure of the plate is common, and the need for primary bone grafts adds additional morbidity to the procedure.

Conventional closed Kuntscher nailing eliminates unsightly thigh scarring, minimizes soft tissue disruption, and reduced infection rate and restores anatomical alignment. Unfortunately, in comminuted fractures, the unlocked cloverleaf shaped nail cannot adequately maintain the length and rotational alignment of the limb.

All fractures were internally fixed with the Indian version of the AO femur nail. We came across 2 cases of HBsAg positive and one HCV positive patient where closed nailing was done successfully under universal precautions. In our study, out of 30 cases, 27 cases (90%) were fixed by closed reduction and 3 cases (10%) by open reduction. Closed nailing is definitely superior to open nailing.

Johnson et al. reported a 13% infection rate with open nailing in 88 patients. In cases where a closed method is used for the reduction of fractures, the piriform fossa is used as an entry point. The medullary cavity of all the fractures was reamed using reamers with an average diameter up to 11mm.

The advantages of reaming are to create a uniform medullary surface area, to promote osteogenesis, to place larger nails that can overcome bending or fatigue failure, and overall to provide high union rates. When cortical chatter was encountered, reaming was stopped, and the nail of size 1mm lesser the diameter of the last reamer used was inserted.

CONCLUSION

Fracture of the shaft femur are one of the commonest injuries sustained in high velocity trauma. Management includes prompt fixation of the fracture, restoration of the anatomical alignment, and , most importantly, early return to work and pre - fracture state. Radiological assessment helps for early intervention of dynamization in case of delayed union. The choice of treatment of femur diaphyseal fractures is by intramedullary interlocking nailing with regular post operative radiological and clinical assessments.

Commencement of Partial Weight Bearing (PWB):-

In our series, partial weight-bearing with a walker was started between 3-10 days in 22 patients (73.33%). Three patients who were treated with open reduction was allowed to partial weightbearing after three weeks. One patient who had ipsilateral tibial shaft fracture was allowed partial weightbearing after six weeks. The average time for partial weightbearing in our study was 6.45 days.

16.5 weeks. Different time periods for the union was found when the fracture was treated with open and closed nailing procedure. We found a slower union in open nailing (20 wks) as compared with closed nailing (18.35 wks). Delayed union was seen in 2 cases (6.66%), but in one case united by the end of 24 weeks without any further surgical intervention and the remaining one case needed dynamization in whom union occurred by 32 weeks.

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- Brumback R, Elision Mollison H and Molligon D. Pudendal nerve palsy complicating intramedullary nailing of the femur. Journal of bone and joint surgery. 1992;74-A: 14501455 Commencement of Full weight-bearing:-In our series, three patients started full weight-bearing at 12th week. 18 patients were able to bear full weight at 15th week, four patients at 18th week, five patients at 21st week. The average time of full weight-bearing was 16.20 weeks.

Bony Union:-

The average time taken for the bony union in our study was