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STABILIZATION OF FEMORAL SHAFT FRACTURES BY INTERLOCKING INTRA MEDULLARY NAILING

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ABSTRACT

Femoral shaft fractures most often will be the result of high energy trauma in young adults.Surgical stabilization of the femoral shaft is the gold standard in their management worldwide. The pioneering work on intra-medullary nailing by Gerhard Kuntscher has revolutionized the management of femoral shaft fractures. Intra-medullary nailing being close to center of femur can tolerate bending and torsional loads better than plates. Closed nailing provides biological fixation. In the present study we would like to share our observations on the outcome of diaphyseal fractures of femur in adults treated with IM Interlocking nail. This is a prospective study of 30 adult patients with diaphyseal femoral shaft fractures treated with IM Interlocking nail. After a thorough pre-operative assessment cases were taken up for surgery. All the patients were assessed radiologically and clinically for fracture union at regular intervals of 6 weeks, 12 weeks and 1 year by using Thoreson's criteria.The functional outcome was excellent in 23 cases, good in 5 cases, fair in 1 case and poor in 1 case. All the patients completed the study period. Closed IM interlocking nailing for femoral diaphyseal fractures provides biological fixation and good clinical outcome. IM nailing holds a good place in treating femoral diaphyseal fractures especially those with high comminution, long spiral and segmental fractures.

KEY WORDS: **Diaphyseal femoral fractures, IM interlocking nailing, Thoreson's criteria**

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INTRODUCTION

Femur is one of the strongest and longest bone in the human body. Femoral shaft fractures most often will be a result of high energy trauma in young adults and they are the major cause of morbidity and mortality. Femoral shaft fractures treated inadequately may cause marked alteration in bio-mechanics of gait and weight bearing. Therefore an appropriate stabilization device for femoral shaft fracture is essential to avoid the above said difficulties for an individual who sustains femoral shaft fracture. Surgical stabilization of femoral shaft fracture by medullary interlocking nails is the gold standard in its management world over. The present study attempts to analyze the effectiveness of closed interlocking nailing (reamed) in the management of diaphyseal fracture of femur so as to restore the patient to functionally and structurally to near normal status

MATERIALS AND METHODS

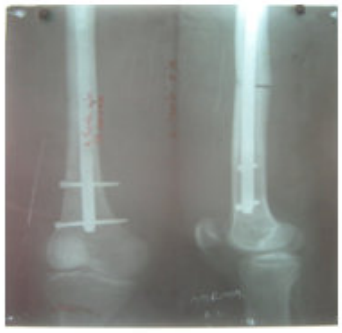
The present study was conducted in the department of orthopaedics at Alluri Sitarama Raju academy of medical sciences Hospital, Eluru, between June 2010 and September 2012 (over a period of 28 months). 30 adult patients with diaphyseal femoral shaft fractures were selected for the present study. A total number of 1220 bony injuries were reported to ASRAM hospital casuality and Orthopaedic OPD during the above said period. Out of which 620 were lower limb fractures. The femoral fractures were 375(60.48%) and the femoral shaft fractures are 62. By deducting patients who come under exclusion criteria, 30 patients were selected for the present study. Among 30 patients 25 were males (83.33%) and 5 were females (16.6%). Of these 26(86.6%) were between the age of 18 and 50. Mean age of our patients is 30.5years. Side of fracture is equal on both left (50%) and right (50%) sides. The most common level of fracture was middle third, in 20 out of 30 cases (66.6%). The most common mechanism of injury is road traffic accident in 25 cases out of 30 (83.3%). In females common cause is domestic fall (Only two RTA cases among five female cases). Patients of age above 18 years with diaphyseal fractures of femur (Both closed & Grade 1compound), both males and females were included in our study. The patients of age less than 18 years and those with pathological fractures were excluded.

On admission general condition of the patients were assessed and stabilized hemodynamically. All patients were evaluated clinically and radiologically. X-rays of thigh including hip and knee joints taken in two planes. Skin traction was applied to the fractured limb and immobilized over Bohler Braun frame till surgery. Patients were operated as early as possible once the general condition of the patient is stable and was fit for surgery and anesthesia. All the patients were operated on a fracture table in supine position under image intensifier. Routine antibiotics and anti inflammatory drugs were given after surgery. Post operatively no external immobilization was prescribed and was advised not to weight bear on affected limb. Patients were discharged following sutures removal after 10 days approximately. They were assessed radiologically on the 2nd post operative day, at 6 weeks, 12 weeks, and then between 4 months to 1 year for the recovery index. Clinical and radiological union results were evaluated by THORESEN'S CRITERIA.

RESULTS

Average time for fracture union was 18 weeks.

PREOPERATIVE



SECOND POST OP DAY

SIX WEEKS FOLLOW UP

3 MONTHS FOLLOW UP

6 MONTHS FOLLOW UP

DISCUSSION

Femoral shaft fractures are usually the result of high energy trauma. Affected people are younger who are in the productive age group and are prone for economic and social burden to their families and to the society if the recovery is not satisfactory. In many of these cases the bone unites with shortening, angulation, or displacement if treated conservatively. An adequate reduction and rigid immobilization by some form of internal fixation is essential in femoral shaft fractures. Introduction of closed locked intramedullary nailing has revolutionized the management of fractures of femur because of its minimal surgical exposure and less demanding surgical skills and facilitates early ambulation. The incidence of femoral shaft fractures was 9.9 per 100,000 person-in an year. During the period of June 2010 and September 2012, over 62 diaphyseal fractures of femur were treated in orthopaedic department at ASRAM Hospital ELURU. After excluding fractures below 18 years of age and fractures of Gustilo Anderson's 2&3 grades, pathologic fractures, 30 patients were selected for the present study. Most of our patients were of younger age group, 20(66.6%) patients between 18-30yrs, the average age being 30.44 years, which correlate the fact that younger population is at increased risk of femoral fractures. Ours is slightly higher when compared to THORESEN[1] (1985), WISS[2] et al (1986) i.e. 28 and 29 years respectively. In our patients significant male dominance 25 out of 30 (83.3%) was seen as compared to 24 (51.06%) females out of 47 patients in THORESEN[1] series. Regarding side of fracture occurrence left 15(50%)and right 15(50%) sides are equally predominant but in the series of WISS[2] et al (1986) and

JOHNSON[3] et al (1984) right side was more involved. In 25 out of 30 patients (83.3%) fractures are of road traffic accidents and more male patients sustained femoral fractures 23(93%) highlighting the fact that males are prone to road traffic accidents. Out of 5 patients in females 3 (60%) sustained fractures because of domestic fall. In THORESEN[1] et al series 65.9% were due to high energy trauma and 34.04% was due to low energy trauma. In our series the level of fracture is dominated by middle 3rd in 20(66.6%) patients followed by 8(26.6%) middle lower 3rd junction fractures and 2(6.66%) upper middle third junction. Other reported series of conventional nailing, this figure ranged from 60-80% and 50% in the series of THORESEN[1] et al. Fracture pattern in our study was transverse in 16 (53.33%) out of 30 patients, 10 (33.3%) comminuted, 2(6.66%) spiral and 2(6.66%) oblique. In the study of THORESEN[1] et al comminuted fractures were the common followed by transverse and then the spiral pattern. In the series of WISS[2] et al comminuted fractures predominated.

Admission – operation interval in our study varied from 2-15 days. Mean interval being 5.06 days .The optimal time for nailing of closed femoral diaphysis fractures has been suggested by BRUMBACK[4] et al (1988) as 7-10 days for elective admissions and immediately for patients with polytrauma to allow prompt mobilization. The mean duration of hospital stay in our study was 16days average which is high when compared to WISS[2] et al series where it was 12days only and relatively low compared to GROSS & KEMPF[5] series (21 days). Intra operatively reduction was achieved by closed means in 26(86.6%) cases and 4(13.3%) needed open reduction due to late operation interval. The reduction of the fractures were good in 28(93.3%) of patients and acceptable in 2(6.6%) when compared to THORESEN[1] et al where 3(6.3%) patients had poor reduction. Post operatively two patients out of 30 in this study had superficial infection (6.66%) and this was controlled by parenteral antibiotics, one had deep infection. It is higher as compared to infection rates in WISS[2] et al series with 0.9% and in CHRISTIE[6] et al series it was 0.8%. The average time of radiological union was 18 weeks in the present study whereas in GROSS KEMPF[5]et al (1985) and in THORESEN[1] et al(1985) series it was 18 weeks and 16 weeks respectively. The average union rate was same in our series compared to the series of the above authors but with WISS[2] et al (1986) it is 26 weeks which is very high compared to ours. In our study no patient was permitted to weight bear fully on effected limb before 6 weeks, which is at par with THORESEN[1] et al series (30 days). One of our case developed non union and 4 cases required dynamization for delayed union compared to 10 cases in THORESEN[1] et al series. All the patients in this study had no problems relating to malalignment, stiff knee and pain. Shortening less than 2cms occurred in 2(6.6%) patients which is very low compared to GROSS and KEMPF[5] where 11(21.1%) patients out of 52 had shortening. In our study 25 patients (83.3%) had full range of knee and hip movements. None reported any fatigue due to prolonged walking. Final outcome was excellent in 25 out of 30 patients 83.33%, good in 3 patients 10%, fair in one patient 3.33% and poor in 1patient 3.33% which is better when compared to THORESEN[1] et al series where recovery rate was 63.8%. In our series younger age group patients had a better functional outcome.

ABBREVATIONS

IM – Intramedullary, RTA- Road traffic accidents

CONCLUSION

Closed IM interlocking nailing for femoral diaphyseal fractures provides biological fixation and good clinical outcome. IM locking nails holds a good place in treating femoral diaphyseal fractures especially those with high comminution, long spiral and segmental fractures

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