

INTERLOCKING INTRAMEDULLARY NAILING IN COMMUNUTED FEMORAL SHAFT FRACTURES.

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Abstract:

A prospective study of 20 comminuted femoral fractures, open and close, treated with interlocked intramedullary nailing. The mechanical strength of the nail and less invasive procedure has made the procedure preferable. Short Operative time and less blood loss was seen during surgical procedure. Out of 20 cases , 10 cases were taken from Nepal Medical College, Kathmandu and 10 cases from Nobel Medical College, Biratnagar, during years 2009 to 2011, which had been completed at least six months follow up. Almost all cases were relatively free from long term complication. The results were promising .All fractures healed within 6 months.

Key words: Comminuted femoral shaft Fractures, Interlocked Nail.

Introduction:

Fractures of shaft of femur are quite common .The goal of treatment is early return of extremity function usually achieved by reliable fixation of fractures.

Shortening of the limb and malalignment, along with contractures of the knee due to prolonged immobilization, have traditionally plagued the orthopedist's management of patients who have these injuries.^{1,2}

Treatment goals are reliable anatomic fixation permitting rapid progress out of supine position, early return of extremity function and subsequent restitution of hip and knee motion and strength.

Materials and Methods:

In this prospective study, a total of 20 patients between 20-60 yrs old were treated for comminuted femoral fractures with interlocked intramedullary nailing system. Grade III and IV comminuted³ fractures and

open femoral shaft fractures type I⁴ were included. Among these cases, 5 cases were taken from Jan 2009 to June 2009 at Nepal medical college, Kathmandu and 15 cases were from Nobel medical college, Biratnagar from April 2010 to Oct 2011. However comminuted femoral shaft fractures of type I and II, open femoral shaft fractures Type II & III and segmental femoral shaft fractures were excluded. This study only aim to study purely about interlocked nailing system in fracture cases found during study period but not to compare between hospitals results. *Surgical Technique:* All were operated under image intensifier. The patients were put in supine position with the affected side up. A small incision over the greater trochanter area was made and the tip of greater trochanter was exposed and entry point made by using the femoral awl. Using the guide wire and the femur was reamed. The nail of appropriate size was driven slowly. The proximal

interlocking screws were placed through the jig provided with the instrumentation. Distal interlocking screws were placed usually with free hand technique. The final position



Position of guide pin being seen in image intensifier

After treatment:

All cases were encouraged to start non weight bearing crutch mobilization after 24 hours of surgery. Gentle range of motion exercises of the knee and hip joints were started on bed. Quadriceps exercises were soon encouraged⁵. Serial X-rays were taken at monthly intervals and gradual weight bearing was started around six weeks after surgery. All cases were followed up for at least six months to be included in the study.

Results:

We had 20 cases of interlocked intramedullary nailing. We have reported the follow-up study up to six months. There were 17 males and 3 female patients with male to female ratio 5.8:1. there were 12 patients in age group 20-29, 4 in 30-39, 2 each in age group 40-49 and 50-59. Mean age was 30.6 years in male and 32.5 years in female. (Table 1).

was checked under the image intensifier. The patients were given intravenous antibiotics.



Awl being used to make starter hole in the piriformis fossa

In 75% of cases the fracture was sustained in road traffic accidents especially motorcycle accidents (50%). In 25% of cases firearm was the cause. (Table:2)

There were 8 open fractures, 5 due to firearm and 3 due to road traffic accidents. The rest 12 fractures were close. (Table-3). There was equal number of patients in each Grade III and IV comminution. (Table: 4)

In 6 patients, there were other concomitant injuries and associated medical illness of hypertension or diabetes mellitus was found in 5 patients. These were fairly controlled before surgery was carried out. (table:5).

Most of the fractures took about 18 weeks to heal (60%) while some 5%-10% healed little earlier (table 6) There were a total of 3 (15%) postoperative complications one of each like a knee flexion < 100°, external rotation of femur 20° and shortening of the femur 2 cm. (Table 7)

Table 1: Age and sex distribution (n=20)

Age group	Male	Female
20-29	12	-
30-39	2	2
40-49	1	1
50-59	2	-
Total	17	3

Table 2: Mechanism of injury (n=20)

Mechanism	No. of patients	Percentage
RTA	15	75
Fire arm	5	25

Table 3: Open V/s close fractures (n= 20)

Open v/s Close	Number	Percentage
Close	12	60
open	8	40

Table 4: Extent of comminution (W and H)

Grade	No. of patients'	Percentage
III	10	50
IV	10	50

Table 5: concomitant injuries (6/20, 30%)

Injury	Number	Percentage
Upper limb	1	5
Ipsilateral lower limb	2	10
Contralateral lower limb	1	5
Head injury	1	5
Chest injury	1	5
Total	6	30

Table 6: Fractures healing time (n=20)

Time in weeks	No. of fractures healed	Percentage
12	1	5
14	2	10
16	2	10
18	12	60
20	1	5
22	1	5
24	1	5
Total	20	100

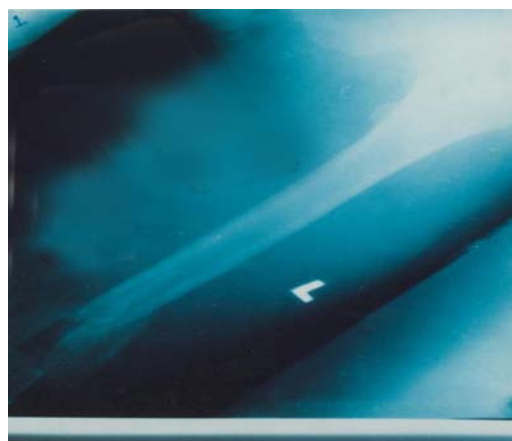
Table 7: Post of complications (n=20)

Complications	No. of complications	No. of patients	Percentage
Knee Flexion<100 ⁰	1	1	5
External rotation of femur 20 ⁰	1	1	5
Shortening of the femur 2 cm	1	1	5
Total	3	3	15

Discussion:

Interlocked intramedullary nailing system showing excellent result in both close & open fractures. A shorter operative time, less blood loss, easy operative technique, early mobilization, shorter hospital stay and lesser post operative problems. Where ever facilities for

interlocked nailing became available, most orthopedic surgeons started treating fractures shaft of femur by interlocked nailing because these system control shortening, angulation & rotation in complex fractures via locking screw.^{6,7,8}



X-ray showing pre operative antro posterior view



X-ray showing immediate post operative lateral view



X-ray showing postoperative antero posterior view



X-ray showing 12 weeks post operative lateral view



X-ray showing 12 weeks post operative antero posterior view

A deep infection after surgery on the femur is a serious complication. In our study we had no deep infection. In their study the fracture healing time is 17.7 weeks while it

X-ray showing 18 weeks post operative antero posterior view

was 12 to 32 weeks in the other groups.(table 8)

Table 8: Studies showing fracture healing (interlocking intramedullary nailing)

Studies	Time of healing
Johnson et al(1984) ⁹	13.8 weeks
Kempf et al (1985) ¹⁰	17 weeks
Johnson and Greenberg (1987) ¹¹	14 weeks
Christie et al (1988) ¹²	17 weeks
Sojbjerg et al (1990) ¹³	12 weeks
Wiss et al (1990) ¹⁴	32 weeks
Anastopoulos et al (1993) ¹⁵	18 weeks
Hajek et al (1993) ¹⁶	12 weeks
Mahmood et al (1993) ¹⁷	32 weeks
Kropfl et al (1995) ¹⁸	14 weeks
Baixuli et al (1998) ¹⁹	20 weeks
Present study	17.7 weeks

Conclusion:

Interlocked Intramedullary Nailing of comminuted femoral shaft fracture is a gold standard method of treatment with advantages of predictability, low rate of complications and full weight bearing is significantly earlier.

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