First Experience with Locked intramedullary nailing of the femur in Kashmir

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Abstract

An experience with 30 cases done between September 2002 and September 2004 at the Bone & Joint Surgery Hospital Srinagar Kashmir is reported.

30 cases of closed Diaphyseal femoral fractures were operated upon by closed antegrade intramedullary interlocking nailing and results assessed as per Pintore et al (1992).
23 cases were locked statically & 7 cases dynamically. One case was dynamised at 14 weeks. No Non-unions were noted.

INTRODUCTION

Femoral shaft fractures are amongst the most common fractures encountered in orthopedic practice. These may result in prolonged morbidity and extensive disability unless the treatment is appropriate ([8]).

Reamed nailing for lower limb fractures is a well established technique ([5]).

Interlocking nailing widens the surgical indications of nailing, allowing it to be used for comminuted fractures, on fractures too proximal or too distal to be operated on without interlocking([9])and on aseptic pseudoarthrosis([3,9]).

30 cases with closed femoral fractures admitted to the Bone & joint Hospital were included in this study. The purpose of this study was to assess the results of application of this technique to these patients.

MATERIAL AND METHODS

30 patients with closed diaphyseal femoral fractures were included in this study. The age of all these patients was more than 18 years.

Exclusion criteria used in this study were:

a-open fractures b-polytrauma c->3wk old trauma d-pathological fractures e-patients with ligamentous knee injuries

All patients were assessed thoroughly and investigated.

SURGERY

After the requisite anesthesia the patient was placed in supine position and traction table was used. The affected limb was adducted and the hip flexed to 25-30º. The foot of this limb was kept in 15 º internal rotations due to 15º anteversion.

The incision was given from just distal to the greater trochanter to about 6-8cms proximal & posterior.

Using a curved awl, the pyriform fossa was breached in the midplane of the femur in both AP & lateral views. Manipulative reduction of the fracture was done and a 3.2 mm guide rod was introduced. The femur was reamed over the guide wire by means of various sized reamers in 0.5 mm increments. The proximal femur was reamed 1mm more than the predetermined diameter of the nail. The nail was introduced and seated. Proximal locking was done by means of a jig and the distal locking was done by freehand technique.

POSTOPERATIVE REHABILITATION

After the operation immediate quadriceps muscle setting exercises and range of motion was begun on the morning after operation. Toe touch crutch walking was allowed depending upon the configuration of the fracture. Progressive weight bearing was allowed depending upon clinical & radiological union.

Review was carried out monthly until final assessment

which was done at 6 months.

RESULTS

The results were assessed as per the following tables:

1-AGE

Figure 1

S.No	Age	Number	%age
1	18-30	22	73.3
2	31-40	4	13.3
3	41-50	3	9.9
4	51-55	1	3.3

The mean age of the patients was 27 years. This distribution reflects the involvement of the younger population in activities involving possible risks.

2-SEX

25 cases were males supporting the aforementioned hypothesis

Figure 2

S.NO	Sex	No.	%age
1	male	25	83.3
2	female	5	16.7

3-SIDE INVOLVED

The involvement of the extremities was equal in terms of the side.

Figure 3

Right	Left
15	15

4-MODE OF INJURY

Figure 4

S.No	Mode of injury	No. of cases	%age
1	RTA	15	50
2	Fall	15	50

5-SITE OF FRACTURE

Figure 5

Site	No. of cases	%age
Proximal	4	13.3
Middle	8	26.6
Distal	3	10
Junction of prox & middle	9	30
Junction of middle & distal	6	20

6-WINQUIST CLASSIFICATION

Figure 6

S.No	Fracture	Number	%age
1	WI	13	43.3
2	WII	5	16.67
3	WIII	3	10
4	Transverse	6	20
5	Segmental	1	3.33
6	Spiral	2	6.66
7	Total	30	

7-23 cases were locked statically & 7 dynamically. One case was dynamised in a delayed manner at 14 wks.

8- 33% cases showed a callus appearance at <4 wks and 13.3% cases at 9wks

.However, 83.3% cases showed a callus formation from 4-8 wks.

9-83.5% cases showed full ROM and 16.5% showed some restriction of motion in the adjacent joints.

10-COMPLICATIONS

Figure 7

S.No.	complication	%age
1	Shortening >2cms	6.66%
2	Fracture comminution	3.33
3	Delayed union	6.66
4	Failed distal locking	13.3
5	Stiff knee	6.66

11-GRADING AS PER PINTORE ET AL ()

Figure 8

Excellent	23	76.66
Good	4	13.33
Fair	1	3.3
Poor	2	6.66

DISCUSSION

Diaphyseal fractures of the femur account for a significant portion of the skeletal system injuries and frequently affect active young adults.

Today, closed intramedullary locked nailing is “the gold standard” in the treatment of diaphyseal fractures of the femur in adults. The favorable effects of physiological loading on fracture healing are well known. Early weight bearing enhances vaascularisation, stimulates secretion of agents promoting fracture healing. It also prevents muscle atrophy and enhances early rehabilitation.

Reaming disrupts endosteal circulation while stimulating hyperemic reactions and periosteal osteogenesis and as a result blood circulation exceeds its prereamed status6.

The advantages of intramedullary nailing in the treatment of

patients who have displaced disphyseal fractures of femur are well documented and complex fractures that are unstable in length or rotation can be treated with closed intramedullary nailing with few complications([4]).

Preservation of length ,alignment and rotation have been facilitated buy the introduction of the intramedullary nails with locking capabilities, thereby extending the indications of the technique to even highly comminuted femur fractures. The risk of infection and non-union is low, the hospital stay is relatively low and early movement by the patient is possible ([4]).

According to Gross & Kempf Interlocking nailing can be applied to any fracture of the femur provided that at least 3-4cms of bone is intact proximally & distally to the fracture site([3]).

Reaming nailing for lower limb fractures is a well established technique and several reports have evaluated its results. Interlocking nailing for long bone fractures of the lower limb have greatly increased the scope of the technique of closed intramedullary interlocking nailing ([2]).

The average time between injury & surgery was about 6 days which was due to the huge workload in our hospital. Satisfactory closed reduction was performed in 27 cases. In 3 cases it was difficult & the fracture had to be opened. All three cases occurred in the initial phases of the study reflecting a relative inexperience. Similar studies don't report any open reductions ([2],[3], [4], [7]).

The nail diameters used in our study were in the range of 9-11mm.Other studies 6, 7 show the use of the nail of 13-14mm.Racial differences in the anatomical dimensions of the bone seem to be responsible for this inconsistency.

In our study we observed failed distal locking in 4 cases (13.3%) and failed proximal locking in 2 cases (6.66%).

In this series there was moderate loss of ROM of knee in 6.66% cases

Infection rate of 3.33% was noted by us.

Majority of the cases in this series ended up with a stable fixation with early rehabilitation, mobilization & return to work

CONCLUSION

Interlocking intramedullary nailing gave satisfactory results in our sudy. About 2 cases (6.66%) delayed unions were noted. No non-unions were noted.

Based on the present study it could be concluded that:

This technique is efficient
It doesn't expose the patient to an undue risk of infection or nonunion.
It permits early weight bearing, minimizes muscle atrophy and ensures complete restoration of motion of the knee.
It reduces the incidence of malunion.
it decreases the length of hospital stay.
It is a minimally invasive procedure.

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