INTERLOCKED NAILING OF COMMINUTED FRACTURES SHAFT OF FEMUR SHAHID SULTAN

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Background: Comminuted fracture shaft of femur are difficult to treat. Internal fixation with ordinary nail does not hold the fracture fragments while osteosynthesis with plates and screws does not always produce stable fixation and involves an increased risk of infection. Methods: Thirty-six comminuted fractures shaft of femur were treated with closed interlocked nailing. There were twenty closed and sixteen open fractures. Results: Thirty-six fractures united without additional surgical intervention. Average time to union was 34 weeks (range 26 to 64 weeks). In five patients secondary bone grafting was done. Conclusion: Closed Interlocked nailing is the treatment of choice for most comminuted fracture shaft of femur.

INTRODUCTION

 Intramedullary nailing is commonly used for the fixation of fracture shaft of femur. But segmental and comminuted fractures are difficult to stabilize by conventional intramedullary nailing. When the intermediate fragment is split or fracture is comminuted, the stability offered by most implants is compromised.

 Conventional closed intramedullary nailing does not provide adequate fixation when cortical contact of the major fragments of the fracture cannot be achieved. Open intramedullary nailing with supplemental fixation does not always produce stable osteosynthesis and there is an increased risk of infection.

 This study was conducted to analyze the results with interlocked nailing of segmental and comminuted fractures of shaft of femur.

 MATERIALS AND METHODS

 This study was carried out at Orthopaedic Department, Ayub Medical College and Hospital Complex Abbottabad. All patients having comminuted fracture shaft of femur who were admitted in Orthopaedic department Ayub Teaching Hospital between September 1999 to March 2001 were treated by interlocked nailing.

 A total of 42 patients with comminuted fractures of shaft of femur were treated. Eight patients were lost to follow up before the fracture was united. So 36 patients were followed till the fracture was united. There were 28 male and 8 female patients. Average age was 28 years (range between 15 years to 60 years).

 There were twenty closed fractures and 16 open fractures. All open fractures were treated with operative debridement, intravenous administration of antibiotics and delayed closed interlocked nailing.

 Two types of interlocked nailing were performed on the basis of the location and the degree of comminution of the fracture. In static interlocked; nailing, screws were inserted proximal and distal to the fracture. Static interlocked nailing was performed in any patient who had Winquist-Hansen Grade 111 or IV comminution or who had a fracture that was axially and rotationally unstable, in dynamic interlocked nailing either a single proximal or a distal screw, but not both, were inserted. This method was used in Grade I or It comminuted fractures in which postoperative shortening was unlikely, but instability in rotation was possible because interdigitation of major fragment could not be achieved.

 All nailing were performed under fluoroscopic control with the use of the technique described by Winsuist and Hansen. All patients were placed supine on the operating table. Lateral incision J at the tip of greater trochanter was given. Guide wire passed through Piriform fossa. In all patients fracture J were reduced closed except in 4 patients, in which H small incision was given at fracture site and after reduction of fracture and passing of guide wire fascia was closed and rest of the procedure done closed I under fluoroscopic control. Post operatively, the patient with static interlocked nailing were treated with six weeks of partial weight bearing on two crutches; followed by progressive weight bearing as tolerated. Patient who had dynamic interlocked nailing were permitted progressive weight bearing on I two crutches. Dynamization of static interlocked; nailing by removal of proximal or distal screw was not routinely done.

 Secondary Bone grafting was done in case of delayed union, usually after 3 to 6 months. Bone grafts were taken from anterior iliac crest.

 The duration of follow up was six to twenty-five months (average 14 months). Static interlocked, nailing was performed in 28 patients and dynamic interlocked nailing in 8 patients.

 Dynamization of static interlocked nailing was done in 6 out of twenty-eight patients by removal of distal screw. Closed nailing was accomplished in 32 patients.
while in four patients, open reduction was necessary because of failure to pass guide wire across fracture site under fluoroscopic control.

The operating time including positioning of patient on fracture table was 120 minutes (range 90 to 240 minutes).

RESULTS

The fracture was on the right side in 20 patients and left side in 16 patients. Road traffic accidents and motorcycle accidents were responsible for sixteen fractures. Twelve fractures were caused by Gunshots. Fall from height caused 8 fractures.

The average time to closed nailing after an open fracture was 12 days (range 7 to 30 days).

There were 6 infections all in open fractures, but all responded well to surgical debridement, antibiotics according to culture and No nail removal was necessary.

One patient developed brachial plexus paresis post operatively but that recovered fully within 6 months. Thirty fractures united without further surgical intervention. The average time to union was 34 weeks (range 26 to 64 weeks). In five fractures secondary bone grafting was done. In one patient nail broke and broken nail was removed and new nail inserted with additional bone grafting. All these six fractures, united in further 26 weeks.

In one patient leg was 1 cm long while in 4 patients shortening of 0.5 to 1 cm was noted.

DISCUSSION

Comminuted fractures of femur usually result from high emergency trauma. This complex fracture is usually accompanied by severe injuries to other organs system7,5,8. In many patients these fractures are open demanding urgent intervention.

Internal fixation of comminuted fractures of the femur shaft has gained widespread acceptance in the past two decades, as implants and technology have improved8,9. However stable internal fixation is difficult to achieve. The use of plate to achieve osteosynthesis of comminuted fracture necessitates a wide operative exposure and extensive stripping of soft tissue, resulting in increased risk of infection and nonunion12,13.

Due to high rate of complications associated with this type of fixation, most Orthopaedic surgeons have advocated intramedullary nailing.

Closed interlocked nailing eliminates unsightly scarring of thigh, minimize disruption of the soft tissue at the site of fracture, reduces the risk of infection and restores anatomical alignment. Locking the nail into the bone with screw proximal and distal to the fracture affords immediate stability.

Virtually all fractures of femur distal to lesser trochanter can be nailed, regardless of the fracture pattern, or the degree of comminution.

REFERENCES