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Research Article

A study of intertrochanteric fractures operated with trochanteric femoral nail at a tertiary hospital

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Abstract

Intertrochanteric fracture fixations are ever evolving as they are among the most common fractures in gediatric age group, A series of 100 patients with Intertrochanteric fractures were treated with Trochanteric Femoral Nail (TFN) in D Y Patil Hospital, Kolhapur and Sir JJ Hospital; from a period of May 2010 to Feb 2014. They were classified according to AO OTA classification and results were concluded by KYLE's criteria. As TFN is an intramedullary implant and operated with minimal invasive technique results in small incison and less blood loss helps in early mobilisation of the paitent, Out of the 100 patients operated 56 had excellent, 23 good, 19 fair and 2 had poor results. Complications were seen in 11 patients with Z effect, nail breakage and shortening. An invasive surgery with a steep learning curve TFN is a judicious and rationale method for treating intertrochanteric fractures.

Keywords: Trochanteric Femoral Nailing (TFN), intertrochanteric fractures

1. Introduction

Intertrochanteric fractures are among the most common fracture encountered and its treatment modality has kept changing as orthopaedics is evolving with every passing day. Various implants and operations had been introduced for IT fractures. Earlier active treatment for such fractures used to be delayed by 3 to 4 weeks which lead to secondary complications. The primary goal of treatment in such fractures should be early mobilisation to avoid secondary complications which can be achieved by open reduction and internal fixation. Intertrochanteric femur fractures may be repaired with either a sliding hip screw or an intra medullary nail. The hip screw has been considered the device of choice because fracture union predictably occurs. A problem with sliding hip screws is collapse of the femoral neck, leading to loss of hip offset and shortening of the leg.

Although some such sliding is expected, too much shortening is detrimental to hip function. Therefore a new intra medullary device[1] has been designed which gives an advantage of minimal invasive surgery shorter operative time. TFN an intramedullary implant being a weight sharing implant accelerates the process of union and mobilisation of the patient becomes faster. As a minimal invasive technique it leads to less blood loss, less soft tissue dissection and negligible muscle damage which helps in decreasing the overall morbidity[2]. All these factors help in mobilisation of the patient and reduction in days of hospital stay.

Trochanteric femoral nail developed by A.O. has two sliding screws. Advantages of their screws are i) More stable fixation. ii) Prevention of rotational deformity.

2. Methodology

In this prospective study, 100 patients of Intertrochanteric fractures admitted in our institute were studied.

Criteria to include patients in this study were

1. Patients with Intertrochanteric fractures above the age of 20 years.
2. Patients fit for surgical intervention.

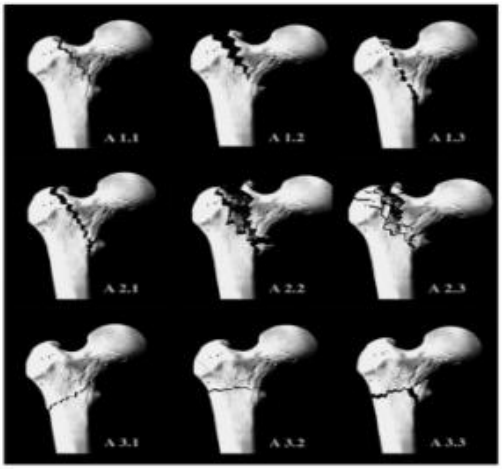
These patients were classified according to AO OTA classification.

A very useful classification as it not only identifies the fracture but also helps in serving as a guide to treatment and prognosis of the patient. There are 12 classifications of Intertrochanteric fractures but AO OTA classification is globally accepted classification and easy to interpret.

2.1 Post-operative protocol

The limbs were elevated over a pillow and patients were kept under observation till stable and then shifted towards.
IV antibiotics were continued for 48 hours and then shifted to oral then.
Static quadriceps were started post op 4th day and active quadriceps and hip flexion were started on 6 & 7th post op day.
Dressings were done on post op day 2 and sutures were removed on post op day 10.
Paitents were encouraged for toe touch walking with help of walker as suture removed and as tolerable.
Partial weight bearing at 4 to 6 weeks post operatively.
Complete weight bearing was allowed after radiological and clinical union.

Final evaluation was done as results were formed by KYLES criteria[3].



2.2 AO Muller Classifications

The classification system devised by Muller & the A.O. group is extremely comprehensive & complete. Each region of the skeleton is assigned an alpha- numerical value & is further classified into a type & a sub group. Schatzker[4] has noted an inter & intra- observer concordance of close to100% for fracture type, 80-85 % for fracture group, 50-60 % for fracture sub-type.

The inter trochanteric fractures have been assigned the number -**31 A**

They are further classified as:

- 31-A1- Proximal trochanteric
- 31-A2-Peritrochanteric multifragmentary
- 31-A3- Intertrochanteric

3. Results

Fig. 1: Preoperative and post operative X-ray of IT fracture operated with TFN.

Fig. 2: 6 weeks follow up, clinical and radiological picture

Fig. 3: Skin closure (minimal incision)

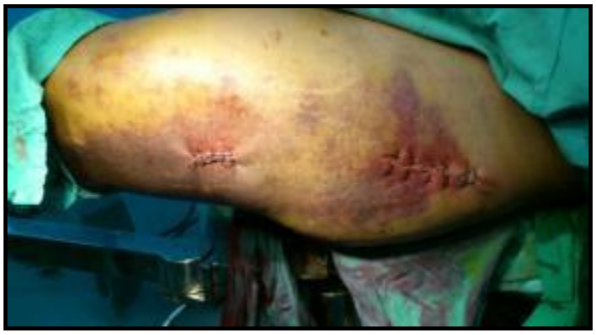


Fig. 4: Results according to Kyles criteria

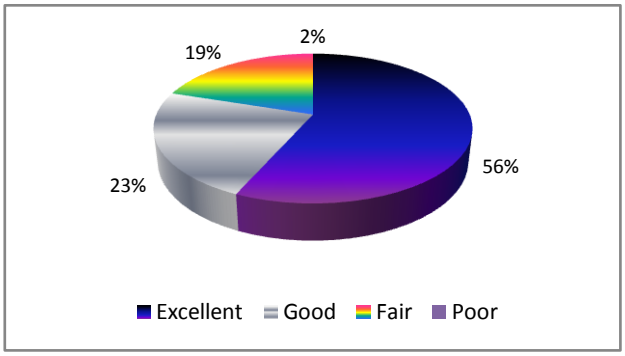


Fig. 5: Complications

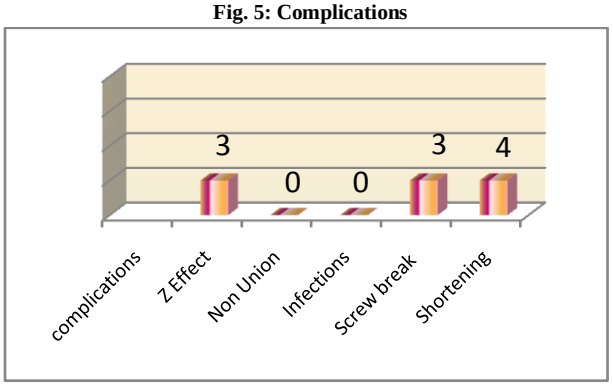


Fig. 6: Radiological picture of complications

"Z" Effect

Screw Breakage

4. Discussion

The successful treatment of Intertrochanteric fractures depends on many factors like[5]

- Age of the patient
- Pts general health
- Time from fracture to treatment
- The adequacy of treatment
- Concurrent medical illness
- Stability of the fixation

At present it is generally believed that all Intertrochanteric fractures should be internally fixed to reduce the morbidity and the mortality of the patient. But the appropriate method and the ideal implant by which to fix the Intertrochanteric fracture is still in a debate. Because each method having its own advantages and the disadvantages.

In the present study 30 patients of either sex with Intertrochanteric fractures were studied. The average operating time was 65 mins from the incision to closure. We had a greater operating time in the beginning which reduced greatly in the later part of the study. This signifies the learning curve of the Trochanteric femoral nailing.

The success of Trochanteric femoral nail depended on good surgical technique, proper instrumentation and good C-arm visualization. All the patients were operated on fracture table. We found following advantages

- Reduction with traction is easier
- Less assistance is required
- Manipulation of the patient is reduced to minimum
- Trauma to patient is decreased
- Better use of C-arm with better visibility.

Placement of the patient on the fracture table is important, for better access to the greater trochanter the upper body is abducted away 10-15°. Position of the C-arm should be such that proximal femur is seen properly in AP and lateral view.

The anatomical reduction and secure fixation of the patient on the operating table are absolutely vital for easy handling and good surgical result. If reduction was not achieved by traction and manipulation then nail reduction was done, in which nail was introduced in the proximal fragment and reduction was tried by rotational movements and compression by the nail. Reduction was achieved in unstable fractures with a bit difficulty but none required open reduction.

In our study one of the important factor was the cost of the implant as Trochanteric femoral nail is costly than the dynamic hip screw, but at the end it didn't cause much difference as:

- Less operative time thus reducing the cost
- No or less need of transfusion of blood
- Post operative antibiotics were used less reducing the cost of the drugs
- Less hospital stay
- Early return to daily activities.

We found Trochanteric femoral nail to be more useful in unstable and reverse oblique patterns due to the fact that it has better axial telescoping and rotational stability. It has shown to be more biomechanically stronger because they can withstand higher static and several fold higher cyclical loading than dynamic hip screw. So the fracture heals without the primary restoration of the medial support. The implant compensates for the function of the medial column[6].

5. Conclusion

According to our study and use of Trochanteric femoral nail in Intertrochanteric fractures we can say that "Trochanteric femoral nail can be considered the most judicious and rational method of treating intertrochanteric fractures, especially the unstable and reverse oblique type."

The reasons to support this are:

- It can be used in all configurations of proximal femoral fractures.
- It is a closed method thus preserves the fracture hematoma and yields early healing and early union.
- It gives good results even with non-anatomical reduction.
- Hip screw and cervical screw placement is important. They have to be parallel in AP and overlapping in lateral. And cervical screw 10mm shorter than hip screw to avoid the "Z - effect".
- Nail entry is on the tip of the greater trochanter or lateral to it as medial entry will cause the distraction.
- Complications were minimal and comparable with other fracture systems.

But Trochanteric femoral nailing requires a higher surgical skill, good fracture table, good instrumentation and good C-arm control. It has a steep learning curve.

Thus we can conclude that the TROCHANTERIC FEMORAL NAIL is after proper training and technique a safe and easy implant option for treatment of complex intertrochanteric fractures.

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