

Proximal Femoral Neck Intramedullary Nailing with a Time Preserving Technique

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Abstract

Back ground:

Proximal femoral fractures are one of the most common fractures around the hip joint.⁽¹⁾ Proximal femoral nail antirotation (PFNA) is a novel intramedullary device with a helical blade that is inserted by impaction, causing bone compaction around the blade⁽²⁾, The procedure involves positioning the patient in different postures like:

a) supine position on fracture table b) In lateral position on ordinary table and c) prone position with extended posterolateral exposure mainly with the use of orthopedic table and image intensifier³

Patients and method:

50 cases (35 female 70%, 15 males 30%) were operated upon by the same surgical team. All the patients had intertrochanteric fracture with variable degree of severity and displacements, ranging from grade I to grade III according to Kyle, all are subjected to the same procedure which includes the following:

Patient positioning:

The patient positioned in pure lateral position putting the normal side on the operative table while the affected side is up. The patient hold in situ with dressing plaster straps attached between the patient abdomen and the operative table, sometimes pillows or sand bags added according to the body built of the patient, the operative time is calculated at the interval from skin incision to skin closure.

Results:

The operative time was between 20 min and 50 min with an average of 25.1 min. which is low in comparison to other studies with p value < 0.05.

Discussion:

In the current study we used the PNF for the fixation of the intertrochanteric fractures, which has been proved to be very good method for fast, stable, method of fixation, with little blood loss and small incision, as supported by many metanalytic researches⁽⁷⁾⁽⁸⁾, we found that putting the patient in lateral position and converting this to supine position is worthy to be taken, since it reduces the operative time and hence the consequent morbidity and mortality.

Conclusion and recommendation:

In conclusion it has been noticed that using the special positioning procedure mentioned in the current study is helpful in passively keeping the reduction of the intertrochanteric fracture to be operated upon with special benefit in obese patients, in addition to the significant reduction of the operative time, which considered very important in reducing the morbidity both medical and surgical in these patients in particular the elderly ones, we highly recommend the procedure in reduction and fixation of any given intertrochanteric fracture.

Introduction:

Proximal femoral fractures are one of the most common fractures around the hip joint. The incidence of proximal femoral fractures occurs in bimodal distribution. The proximal femoral fractures in the young adults are due to high velocity trauma while the elderly adult sustain injury secondary to osteoporosis, Proximal femoral fractures occur typically at the junction between trabecular bone and cortical bone where the mechanical stress across the junction is highest in the femur, which is responsible for their frequent comminution.⁽¹⁾

Proximal femoral nail antirotation (PFNA) is a novel intramedullary device with a helical blade that is inserted by impaction, causing bone compaction around the blade; this compaction retards rotation and varus collapse, these characteristics provide optimal anchoring and stability when the implant is inserted into osteoporotic bone.²

The procedure involves positioning the patient in different postures like:

a) supine position on fracture table b) In lateral position on ordinary table and c) prone position with extended posterolateral exposure mainly with the use of orthopedic table and image intensifier⁽³⁾.

The operative time is an important factor that it made the use of PFN popular and preferable method for treatment of intertrochanteric fractures most of the literatures said that the operative time is around 50 min, the mean operation times were respectively 38 minutes. According to Woong Chae Na, Chae Won Lim, Sang Hong Lee in their paper published in Medical Biological Science and Engineering. Under the title of Comparison of osteoporotic intertrochanteric fracture fixation using a proximal femoral nail with a helical blade and lag screw type proximal femoral nail⁽⁴⁾

In addition to the advantage of low blood loss and small incision and early recovery.

Patients and method:

During the period between jan.2016-jan.2020 50 cases (35 female 70%, 15 males 30%) were operated upon by the same surgical team.

All the patients had intertrochanteric fracture with variable degree of severity and displacement, ranging from Kyle grade I to grade III, while Grade VI was excluded all are subjected to the same procedure which includes the following:

Patient positioning:

The patient positioned in pure lateral position putting the normal side on the operative table with flexion of the knee, while the affected side is up. The patient hold in situ with dressing plaster straps attached between the patient abdomen and the operative table, sometimes pillows or sand bags added according to the body built of the patient, all the patients are subjected to spinal anesthesia with or without additional sedatives, the patient is scraped and dressed as usual than (then) image intensifier is used to check the fracture status. This particular position usually leads to internal rotation of the limb and reduction, after checking the state of the fracture's reduction, through a small 1-2 cm incision over the greater trochanter tip guide wire is used followed by cannulated awl to open the medullary canal than (then) reaming is done as usual followed by the introduction of the intramedullary stem, than (then) simply the plaster straps used to hold the patient in lateral position is cut allowing

the patient to lay supine, this is done with respect to maintain traction and keeping the reduction by an assistant, the usual steps of putting the blade or the screw is used by the help of the attached jig handle and image intensifier, also one or two antirotatory screws are fixed to the femoral shaft as usual through small stab incisions, wounds closure by one or maximum two stitches. Followed by dressing.(maximum two stiches followed by dressing)

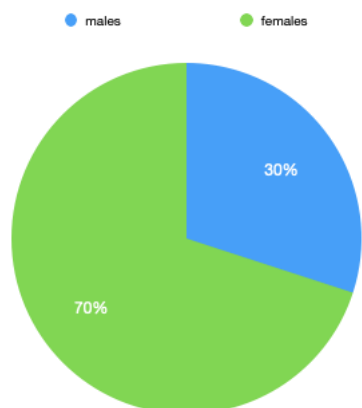
The operative time was calculated at the interval from skin incision to skin closure. Check XR obtained post operatively as shown in fig.1



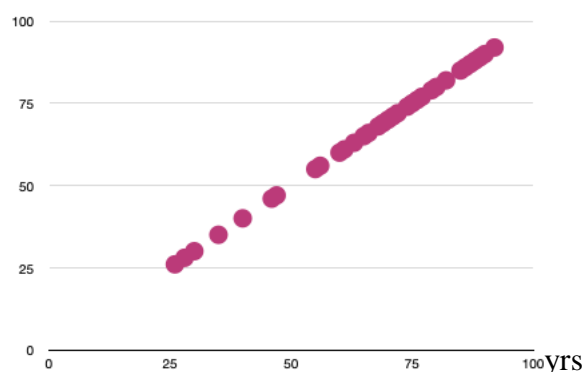
Fig. 1 post operative check XR

Results:

Fifty cases were included in the study cases (35 female 70%, 15 males 30%) see graph 1 all with acute intertrochanteric fracture their ages range from 26 to 92 yrs the average was 70.72 as shown in graph 2

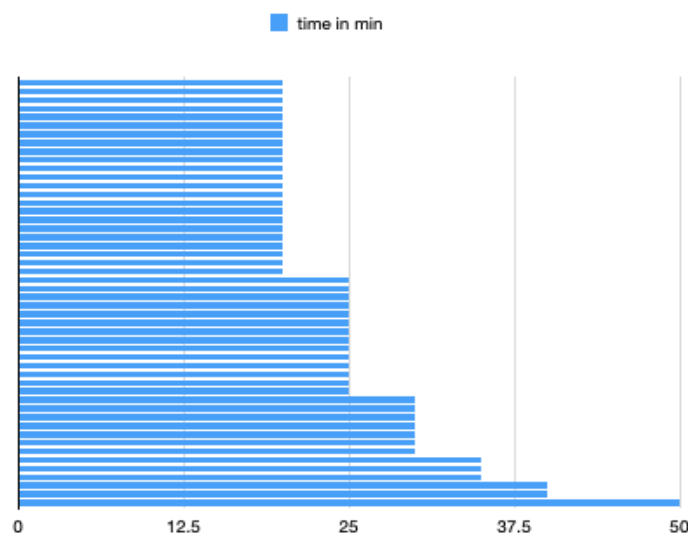


Graph 1 male to female distribution



Graph 2 age distribution

The operative time was between 20 min and 50 min with an average of 25.1 min as shown in graph 3



Graph 3 operative time distribution most of the cases were around the 25 min.

Discussion:

Proximal femoral fractures are one of the most common fractures around the hip joint. The incidence of proximal femoral fractures occurs in bimodal distribution. The proximal femoral fractures in the young adults are due to high velocity trauma while the elderly adult sustains injury secondary to osteoporosis, Proximal femoral fractures occur typically at the junction between trabecular bone and cortical bone where the mechanical stress across the junction is highest in the femur, which is responsible for their frequent comminution. ⁽¹⁾

Proximal femoral nail antirotation (PFNA) is a novel intramedullary device with a helical blade that is inserted by impaction, causing bone compaction around the blade; this compaction retards rotation and varus collapse, these characteristics provide optimal anchoring and stability when the implant is inserted into osteoporotic bone. ⁽²⁾

In the current study we used the PNF for the fixation of the intertrochanteric fractures, which has been proved to be very good method for fast, stable, method of fixation, with little blood loss and small incision, as supported by many metanalytic researches ⁽⁷⁾⁽⁸⁾.

The current study concentrate on the time factor by using the new patient positioning technique, in putting the patient laterally to start with and turn the patient later to supine

position without the use of orthopedic table, where many authors agree about one of the usually used techniques and compare the supine position with the lateral with the advantage of lateral position as agreed by many⁽⁹⁾

This positioning technique had the advantage of reducing the operative time to a mean of 25.1 min, which seems better than the time registered in many other studies used the PNF system for intertrochanteric fracture management. Were Weiguang Yu, et al mentioned PFNA-II, 52.3 ± 4.0 min⁽⁶⁾, and Prakriti Raj Kandell who used the traditional positioning using the orthopedic table with a mean operating time of 42.08 minutes ranging from 30-60 minutes⁽¹⁰⁾

While Li Xue, et al mentioned lateral position took about 50.6 min as a mean in comparison to those treated in supine position in which they mentioned a time mean of 65.67 min while in the current study we noticed a significant difference in the operative time in comparison to the previous studies with a p value < 0.05

This is helpful in reducing the morbidity of the patient and encourages early mobility and rehabilitation, in addition to that we noticed that putting the patient in lateral position initially allow the foot to rotate internally allowing a passive reduction maintenance in comparison to supine position, in addition to that there was a great ease of this trick in managing the obese patients in particular, in term of maintaining the reduction in lateral position in one hand with the easiness of controlling the position of the c arm image intensifier in the other hand.

Conclusion and recommendation:

In conclusion it has been noticed that using the special positioning procedure mentioned in the current study is helpful in passively keeping the reduction of the intertrochanteric fracture to be operated upon with special benefit in obese patients, in addition to the significant reduction of the operative time, which considered very important in reducing the morbidity both medical and surgical in these patients in particular most of them are elderly ones, we highly recommend the procedure in reduction and fixation of any given intertrochanteric fracture.

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