Short Helical Blade for Treatment of Intertrochanteric Hip Fractures in Elderly Patients

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Introduction

Hip fractures in the geriatric population cause short and long term pain, impaired function, and reduced quality of life. The overall one year mortality after hip fractures for the elderly patients is high (approximately 20-25%) [1]. One-half of all hip fractures are intertrochanteric fractures [2].

The conventional osteosynthesis for intertrochanteric fractures include sliding hip screws (DHS) and intramedullary nail (gamma nail, PFN) continues to be unacceptable even if increasing age and co-morbidity of patients are taken into account. Although the use, intramedullary devices have become increasingly popular, particularly amongst teaching institutions and younger surgeons [2,3], the optimal choice of stabilization remains controversial. Therefore, new intramedullary techniques are under development, and we report our results with the Trochanteric Femoral Nail (TFN) in treatment of trochanteric fractures.

Patients and Methods

Eleven patients (over the age of 65 years) between the years 2012 and 2015 with intertrochanteric fracture (Figure 1) were treated with short cephalomedullary device (Synthesis TFN).

The operations were all performed under spinal anesthesia with the use of an image intensifier. Patient is positioned on fracture table with traction supine, and under image intensifier fracture reduction is done (Figure 2). After TFN is inserted, a post-operative x-ray (Figure 3) was taken to check the reduction and alignment. The patient was mobilized on third day with the help of the walker and partial weight bearing, and discharged on the fifth day to review on 12th post-operative day for suture removal. After first month and third month (Figure 4) check X-ray was done to see the fracture heal and prognosis. All patients were grade with Harris Hip Score [4] for the outcome on 12th month.

Figure 1: Preoperative AP radiograph: Displaced Intertrochanteric hip fracture.

Figure 2: Fracture reduction under image intensifier.

Figure 3: Post-operative x-ray. Open reduction and internal fixation with a short (TFN) intramedullary nail.

Figure 4: Third month post-operative X-ray: fracture heals is observed.

A retrospective chart review of all available documentation for these patients was conducted beginning allowing for a minimum one-year follow-up from surgery for all patients.

Results

The study population consisted of 11 patients: 2 males and 9 females with an average age of 76.8 years. There were no mortalities during the first 90 days after surgery. All patients had sufficient follow-up for final analysis. The average operative time was 1hr 10min (1to 2hr) and the average length of hospital stay was 7.15 days.

Five patients required blood transfusions post-operatively. There were no infections, non-unions, malunions, peri-prostheticfractures, or complications from the intramedullary deviceduring the study period.At 3rd month follow up x-rays were taken and reduction was good in all the case and pain was normal.Hip score at the end of 12 months was excellent 45.5%, good in 27.3%, fair in 18.1% and poor in 9.1% (Table 1).

Table1: Results of short intramedullary nailing of intertrochanteric hip fractures.

Variable	Outcome			
Total Number of Patients	11			
Average Length of Hospital Stay	1hr 10min (1 to 2hr)			
90-day mortality	5/11 (45.5%)			
Average Length of Hospital Stay	7.15 days			
90-day mortality	0/11			
Infections	0/11			
Nonunions	0/11			
Malunions	0/11			
Implant complications	0/11	Good	Fair	Poor
Harris Hip Score	5 (45.5%)	3 (27.3 %)	2 (18.1 %)	1 (9.1%)

Discussion

A wide range of proximal femoral fracture fixation devices have been employed over the years and the sliding compression hip screw and side plate, became the implant of choice for the fixation of intertrochanteric fractures in the latter half of the twentieth century [5-7].

Antegrade intramedullary nailing of intertrochanteric fractures with use of a short nail through which a large screw was inserted into the femoral neck and head for interlocking was introduced by Halder in the 1980s in the form of the Gamma nail [8]. Early reports using this device designed by Grosse and Kempf in Strasbourg, France suggested some substantial advantages. However, there was a high rate of technical complications, including fracture of the femur distal to the nail [9,10]. The device was redesigned in 1997 to become the Trochanteric Gamma nail, with a smaller lateral bend, a shorter overall length, and only one distal interlocking screw.

The use of short intramedullary devices in the management of elderly patients with intertrochanteric fractures of the hip is controversial. While some studies have identified increased rates of femoral fracture with IMN, it is important to take into account the surgeon experience and the improvements in implant design. Other studies have found that there is in fact a steep learning curve associated with the IMN, with more experienced surgeons having improved results and decreased complication rates [11-13]. In the present study, we found that the use of a short intramedullary device (Synthes TFN) for the treatment of intertrochanteric hip fractures in elderly patient achieved good outcomes at one year with no device-related complications.

The results of our study have shown that the use of a short intramedullary device (Synthes TFN) to treat intertrochanteric hip fractures in elderly patient achieved good outcomes at one year with no device-related complications.

The present study is limited due its retrospective design, small series and no control group.

Conclusion

In this small patient group TFN shown good outcome with no complications after treatment.

Statement of Informed Consent

All study participants provided informed written consent prior to study enrollment.

Statement of Human Rights

All procedures followed were in accordance with the Helsinki Declaration of 1975, as revised in 2008. Informed consent was obtained from all patients for being included in the study.

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