Original Article

Treatment of Unstable Intertrochanteric Femoral Fractures by Dynamic Hip Screw Vs Proximal Femoral Nailing

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Abstract

Background*:*Inter trochanteric fractures are increasing as the incidence of contributing conditions like osteoporosis, old age and trauma increases. Unstable fractures pose a challenge in management of these fractures. Multiple options for fixation are available but the more commonly used DHS has its own pros and cons. Intra medullary devices offer more stable construct and a good functional outcome.

Method*:* A prospective study was done on 40 cases of unstable intertrochanteric fractures. They were randomly allocated to two groups. Group A was treated with DHS and group B with PFN. Post operatively the cases were followed up for a period of 2 years at regular intervals. Comparison between the two groups in terms of intra operative and post-operative advantages was done*.*

Results*:* Intra operative parameters like operative time and blood loss were more in DHS group whereas radiation exposure was more in PFN group. Post-operative parameters like duration of stay in hospital, early weight bearing, union rate, infection rate, implant failure was favourable in PFN group.

Conclusion*:* In treatment of Unstable Intertrochanteric Fractures PFN is better than DHS.

Keywords: Unstable intertrochanteric Fracture, PFN, DHS

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Introduction

With increase in road traffic accidents and life expectancy, the incidence of hip fractures is in increasing trend. The incidence was estimated to reach 5.12 million in the year 2040 [1]. Hip fractures mainly include fracture neck of femur and intertrochanteric fractures. Intertrochanteric fractures contribute to considerable morbidity of the individual [2]. Although intertrochanteric fractures are managed by internal fixation, the implants are diverse from plates, Dynamic hip screw (DHS) to intra medullary nails. DHS was routinely used in the management of these fractures [3,4]. With the development of biomechanical advances, intramedullary implants overtook the position of DHS [5].

Even then there are some failures in intramedullary nails with improper techniques [6,7]. In this study, a comparative analysis ofunstable fractures managed by DHS and Proximal femoral nail (PFN) was done.

Material & Methods

A prospective study was done at our tertiary care centre on unstable intertrochanteric fractures between March 2014 and February 2016. 40 consecutive patients who met the inclusion criteria were included in the study. Inclusion criteria were patients above 45 years of age with unstable intertrochanteric fracture, who were willing to participate in the study. Compound fractures, pathological fractures, associated shaft fractures, patients unfit for surgery and those who were not willing to participate in the study were excluded. Patients were randomly grouped into two groups. Group A received DHS and group B received PFN as fixation modality for the intertrochanteric fracture.

After thorough history of the injury, patients were examined clinically. Then roentgenograms of pelvis with both hips antero-posterior view and lateral view of the involved hip were taken. Patients were stabilized. After fitness for surgery, patients were posted for surgery. Using C-arm and traction table, fracture was anatomically reduced and internally fixed with either DHS or PFN as per the group where the patient belonged. Intra-operative details like operative time, blood loss, number of C-arm images required for surgery were recorded. Post-operatively the patients were managed

according to the protocol of the centre. Post-operative details like duration of stay in hospital, time taken to bear weight on the affected limb, time taken for radiological union and complications related to fracture and implants were noted on subsequent follow-up. The results were compared between the groups.

Results

Average age of the patients included in the study was 62.5 years(Range: 45 – 70 years). Out of 40 cases, 65% (26 cases) were female. 67.5% (27 cases) were due to domestic fall and rest was due to road traffic accident. Average admission to operation time was 3.4 days (range: 3-7 days). Average duration of surgery was 58.4 min for PFN and 71.2 min for DHS. Average blood loss was 40% more in DHS. Number of intraoperative C-arm pictures required was 30% more for PFN. Average duration of stay in hospital was 8.6 days for PFN (5 days -12 days) and 10.4 days (7 days – 15 days) for DHS. Weight bearing was started on an average of 4.3 weeks (2 weeks – 6 weeks) in PFN and 5.2 weeks (4 weeks – 8 weeks) in DHS. Tip-apex distance was more in DHS than PFN. All cases operated by PFN united but one fracture (5%) in DHS group had non-union which was managed by bone grafting. Average time taken for radiological union was earlier in PFN (12.2 weeks) than DHS (13.5 weeks).

Complications	**DHS**	**PFN**
Joint stiffness	7	2
Malunion	3	1
Nonunion	4	0
Infection	1	0
Shortening	3	0
Implant failure	4	1

Table 1: complications noted in DHS and PFN groups.

Discussion

The ideal fixation device for intertrochanteric fractures is not optimized and [8,9] a single device isnot suitable for all the fractures, indicating the complexity of this fracture. With the development of DHS, these fractures were managed with good results in earlier periods [10]. Larger exposure, blood loss, increased operative time and mechanical failures if implant [11] lead to the search of newer implants. Improper placement of lag screw, not placing screw close to subchondral bone of head and not maintaining minimal Tip-Apex distance (TAD) were imposed as causes for screw cut-out [12]. In early 90's, PFN was developed with biomechanical advantages over DHS and has become more prevalent in use [13,14,15]. PFN were also not without failures, still mechanical failures remain a major concern. One method to reduce the mechanical failure significantly is placing screws in "safe zone" shown by Herman et.al [16].

Various studies showed PFN has several advantages over DHS. Pan X-h et.al [17], showed minimal invasiveness, reduced operative time, reduced blood loss in PFN operations as compared to DHS. Saudan M et.al [18], noted reduced infection rate in patients operated with PFN. Rigid fixation, thus early rehabilitation and reduced hospital stay was emphasized in the study by Pajarinen J et.al [19]. Better union rates with PFN as compared with DHS were demonstrated by Kumar et al [20].

In our study, we noted similar results as those of previous studies with reduced operative time, minimal blood loss, reduced infections, earlier rehabilitation, union and less implant failure in PFN group. One disadvantage we came across was slightly increased number of C-arm exposures required for PFN procedure. Overall, PFN has the mechanical and biological advantage over DHS in management of unstable intertrochanteric fractures.

Conclusion

Unstable variety of intertrochanteric fractures are difficult to manage. PFN is load sharing device with a better biomechanical advantage, offers biological indirect reduction, allows early mobilization and weight bearing. Hence, PFN scores above DHS in unstable trochanteric fractures.

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