



POST OPERATIVE AND INTRAOPERATIVE BLOOD TRANSFUSION REQUIREMENT AND NON UNION (SURGERY) IN INTERTROCHANTERIC FRACTURES TREATED WITH PROXIMAL FEMORAL NAIL VS DYNAMIC HIP SCREW: RETROSPECTIVE COMPARATIVE STUDY

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Abstract:

Peritrochantric (intertrochantric and subtrochantric) fractures are one of the commonest fractures in elderly patients with osteoporotic bones. Implant of choice for such fractures is always debatable. Commonly used implants are proximal femoral nail (PFN) and dynamic hip/condylar screw (DHS/DCS). Both implants have list of merits and demerits, Specific and relative indications. Objective of this retrospective comparative study is to compare post operative and intra operative blood (whole blood or component) transfusion requirement and non union (resurgery) when peritrochantric fractures treated with PFN and DHS/DCS. In this retrospective study we compared intra operative or post operative blood or component transfusion in 30 patients of peritrochantric fracture treated with PFN (intramedullary fixation) with 30 patients of same fracture treated with DHS/DCS (extramedullary fixation). Mean age is 59.9 ± 1.1 year, 34 (57%) male, 26 (43%) female. Domestic fall on floor is the commonest cause 39(65%) patients. Other are road traffic accident 10(17%), fall from stairs 8(13%) and fall from height 3(5%). In intramedullary group (PFN) blood or component transfusion is required in 3 (10%) cases. In extramedullary group blood or component transfusion is required in 11 (37%) cases. P- Value in two groups for blood or components transfusion requirement is significant ($P < 0.05$). Non union (resurgery) is reported in 3 cases in intramedullary (PFN) group and in 7 cases in extramedullary (DHS/DCS) group. In present study we concluded that less post operative or intra operative blood or components transfusion is required in intramedullary (PFN) group as compare to extramedullary (DHS/DCS) group. We also concluded that non union rate is slightly more in extramedullary (DHS/DCS) group as compare to intramedullary (PFN) group. But this difference is statically insignificant ($p > 0.05$)

Keywords: blood transfusion, peritrochantric fractures, Proximal Femoral Nail (PFN), Dynamic Hip Screw (DHS), Dynamic Condylar Screw (DCS), Non union, Resurgery

Introduction

Peritrochantric fractures are one of the commonest fracture occurring in elderly patients with osteoporotic bones. Intertrochantric fracture is one of the most common fractures of the hip especially in the elderly with osteoporotic bones, usually due to low-energy trauma like simple falls.¹ The incidence of intertrochantric femoral fractures has increased significantly during recent decades and this tendency will probably continue in the near future due to the rising geriatric population and increase in incidence of osteoporosis. The incidence of intertrochantric fractures varies from country to country. Gulberg et al. has predicted that the total number of hip fractures will reach 2.6 million by 2025 and 4.5 million by 2050.² Subtrochantric fractures are present both in young and elderly patients. In young patients it occurs as a result of high velocity trauma like road traffic accident. In elderly patients it occurs a result of low velocity trauma such as domestic falls.³ Additionally Elders who are taking

bisphosphonates may sustain a pathologic or atypical subtrochantric fracture due to cortical weakness.

DHS/DCS is standard extra medullary implant for peritrochantric fracture.^{4,5} PFN and Gamma nail are two most commonly used intra medullary for intertrochantric fractures. Previously done studies show that gamma nail PFN do not show as good result as with DHS due higher incidence of post operative fracture of shaft femur.^{6,7} In our institute we most commonly use PFN (proximal femoral nail long/short) and DHS/DCS (dynamic hip/condylar screws) for peritrochantric fractures.

The aim of this retrospective study is to compare the intra operative/post operative blood or component transfusion requirement and non union (resurgery) rate when treated peritrochantric fractures with PFN and DHS/DCS.

Material and Methods

Study design: Retrospective comparative study

Sample Size: In this retrospective study Central Registration Store records from July-2016 to January-

2019 of patients of peritrochantric fractures treated either with PFN (intramedullary) or with DHS/DCS (extramedullary) were taken who were treated at Orthopaedics Department of Adesh Institute of Medical Sciences and Research (AIMSR), Bathinda, Punjab.

Inclusion Criteria: In this retrospective study we included patients of either sex with isolated peritrochantric fracture (intertrochantric and subtrochantric) in whom no blood transfusion was required before surgery.

Exclusion Criteria: Patients of poly trauma with multiple fractures, patients of severe anaemia requiring multiple blood transfusions before surgery, patients having H/O blood dyscrasia and deranged LFT and RFT are excluded from this study, any other patient who required blood transfusion pre-operatively.

Data Collection Procedure: Permission to conduct the study was taken from Institutional Ethical Committee. The records of Central Registration Store of Orthopaedics Department of Adesh Institute of Medical Sciences and Research (AIMSR), Bathinda were explored to search the bed head tickets patients with peritrochantric (intertrochantric and subtrochantric) fractures treated with PFN, DHS or DCS. Follow up records from OPD department were taken. Telephonic inquiry regarding eventful course and re-surgery (failure) was inquired from patients. All patients who met inclusion criteria were enrolled for study. From hospital record of each patient, the name, age, sex, CR. No., mechanism of injury, type of fracture (intertrochantric or subtrochantric), type of on operation table reduction (closed(CRIF) or open(ORIF)), type of implant used, intra-operative or post-operative blood (or packed RBCs) transfusion requirement were noted. Patients were divided into two groups. In Group A above mentioned parameters of 30 patients treated with PFN were included. In Group B above mentioned parameters of 30 patients treated with DHS/DCS were included.

Data Analysis: Data was analysed by using SPSS Version 22. Mean age of patients with peritrochantric fractures, gender distribution, mode of injury, type of fracture, type of reduction(CRIF or ORIF), type of implant used (intramedullary(PFN),extramedullary (DHS/DCS) and blood transfusion requirement in intra operative or post operative period was noted.

Results

Mean age of patient in this study is 59.9 ± 1.1 year, 34 (57%) patients are male, 26 (43%) are female patients. Domestic fall on floor is the commonest cause 39(65%) patients. Other causes are road traffic accident 10 (17%), fall from stairs 8(13%) and fall from height 3(5%). Open reduction in intramedullary implant (PFN) is done in 4 (13%) cases. In intramedullary group closed reduction is

done in 26 (87%) cases. In extramedullary group (DHS/DCS) Open reduction is done in 21(70%) cases and closed reduction is done in 9 (30%) cases. In intramedullary group (PFN) blood or component transfusion is required in 3 (10%) cases. In extramedullary group blood or component transfusion is required in 11 (37%) cases. The difference between two groups for intra operative and post operative blood or components transfusion requirement is significant ($P < 0.05$). Non union (resurgery) is reported in 3(10%) cases in intramedullary (PFN) group while in extramedullary (DHS/DCS) group non union (resurgery) is reported in 7(23%) cases. This difference between two groups is statically insignificant ($p > 0.05$) Table1 and 2.

Table 1: Demography of patients

Mean Age	59.9±1.1 year
Males	34 (57%)
Females	26 (43%)
Cause of injury	
Domestic Fall	39(65%)
Road traffic accident	10(17%)
Fall from stairs	8(13%)
Fall from height	3(5%)

Table 2: Comparison of outcomes in groups

	Intramedullary(PFN) group	Extramedullary(DHS/DC S) group
No. of patients	30	30
CRIF	26	9
ORIF	4	21
Blood or components transfusion requirement*	3	11
Non union(Resurgery)*	3	7
*		

*showed significant difference in Intamedullary (PFN) and Extramedullary (DHS/DCS) group ($p < 0.05$)

**showed insignificant difference in Intamedullary (PFN) and Extramedullary (DHS/DCS) group ($p > 0.05$)

Discussion

Treatment of peritrochantric fracture is evolved significantly in last few decades. Treatment is still based on type of fracture and quality of bone. For peritrochantric fractures DHS/DCS is gold standard implant for long time. PFN was designed to overcome the drawbacks of Extramedullary implants and to give more stability in fracture fixation especially in unstable fractures. It imparts a lower bending moment, compensates for the function of the medial column and acts as a buttress in preventing the medialization of the shaft.⁸

In present study we compared the blood or components transfusion requirement and non union (resurgery) rate

in peritrochantric (intertrochantric and subtrochantric) fractures treated with extramedullary implant (DHS/DCS) with such fractures treated with intramedullary implant (PFN). In this study we observed that blood or components transfusion requirement is significantly lower in Intramedullary fixation (PFN) group when compared with extramedullary fixation (DHS/DCS) group ($p < 0.05$). In this study we also observed that non union (resurgery) rate is slightly more in extramedullary (DHS/DCS) group as compare to intra medullary (PFN) group but this difference is statically insignificant ($p > 0.05$).

PFN is better alternative to DHS in the treatment of intertrochanteric fractures but is technically difficult procedure and requires more expertise as compared to DHS. With experience gained from each case operative time, radiation exposure, blood loss and intraoperative complications can be reduced in case of PFN.⁹

Pervez and colleagues revealed that no significant difference was found in several parameters, such as length of surgery, pneumonia, thromboembolic complications and wound infection or hematoma, between PFN and DHS. However, regarding blood loss, the fracture fixation with DHS led to more blood loss than with nail, as reported in several meta-analysis.¹⁰

DHS has increased intra operative blood loss (160 ml), longer duration of surgery (54.6 min) and required longer time for mobilization (15 weeks) while patients who underwent PFN had lower intra operative blood loss (95 ml), shorter duration of surgery (41.2 min). The Salvati and Wilson hip scoring is better in PFN group.¹¹

The DHS patients had significantly more intra operative blood loss compared to PFNA group (average 380/120ml).¹² This is similar to the series by Baumgaertner and associates who also found a significant difference in the intra operative blood loss in their series, with 44% less blood loss in PFN.¹³

Conclusion

In present study we concluded that less intra operative or post operative blood or components transfusion requirement in intramedullary (PFN) group as compare to extramedullary (DHS/DCS) group. Difference between

the non union (resurgery) rate is statically insignificant between two groups ($p > 0.05$).

However present study has limitations as in this study the number of patients is small. A comparatively bigger structured and cross matched study with larger number of patients is required to assess actual blood transfusion requirements in both groups.

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