ORIGINAL RESEARCH PAPER

Orthopaedics

AUGMENTING PROXIMAL FEMORAL NAILING WITH TROCHANTERIC SUPPORT PLATES FOR UNSTABLE INTERTROCHANTERIC FRACTURES: A PROSPECTIVE FUNCTIONAL ANALYSIS

KEY WORDS:

Dr. Shrimaya Pani Hi-Tech Medical College & Hospital, Bhubaneswar.

Dr. Hatia Marandi Hi-Tech Medical College & Hospital, Bhubaneswar.

Dr. Shakti Swarup Panda Hi-Tech Medical College & Hospital, Bhubaneswar.

ABSTRACT

The management of unstable intertrochanteric femur fractures remains complex, particularly when lateral wall integrity is compromised. While the Proximal Femoral Nail (PFN) is a standard fixation method, the loss of lateral support can result in mechanical failure. Augmentation with a Trochanteric Support Plate (TSP) has been proposed to enhance stability. This study assesses the efficacy of combining TSP with PFN in these complex fractures. A prospective, non-randomized observational study was performed at MGM Medical College & Hospital, Aurangabad, from June 2023 to 2025. Thirty patients (aged 30–80 years) with unstable intertrochanteric fractures and lateral wall compromise underwent Open Reduction and Internal Fixation (ORIF) using PFN augmented with TSP. Outcomes were measured using the Harris Hip Score (HHS) and radiographic assessment at 6 weeks, 3 months, and 6 months. The cohort had a mean age of 60.8 \pm 14.35 years with a male predominance (60%). Low-energy falls were the leading cause of injury (43.33%). Good fracture reduction was achieved in 66.67% of cases. Functional outcomes improved significantly, with 46.67% of patients achieving excellent HHS scores (>90) by 6 months. Complications included screw migration (10.00%) and anterior hip pain (6.67%), with no instances of avascular necrosis or implant failure. Supplementing PFN with a Trochanteric Support Plate improves functional outcomes and provides robust stability in unstable intertrochanteric fractures, reducing implant-related complications.

INTRODUCTION:-

Intertrochanteric femoral fractures constitute a significant portion of orthopedic trauma, representing nearly 45% of all hip fractures, largely driven by an aging global population and osteoporosis. These injuries are associated with substantial morbidity and mortality.

Fractures classified as AO/OTA 31-A2 and 31-A3 are particularly challenging due to posteromedial comminution and lateral wall instability. While the Proximal Femoral Nail (PFN) offers biomechanical advantages such as minimal soft tissue dissection and early mobilization, its solitary use in the presence of a compromised lateral wall carries risks of varus collapse and screw cut-out.

To mitigate these risks, the Trochanteric Support Plate (TSP) was developed to buttress the lateral femoral wall. Biomechanical and preliminary clinical evidence suggests that this combined construct increases stiffness, resists varus deformity, and enhances rotational stability. This study aims to validate these findings by evaluating radiological healing and functional recovery in patients treated with PFN augmented by TSP.

MATERIALS AND METHODS:

Study Design And Population:

This prospective, observational study was conducted between June 2024 and 2025. The study enrolled 30 patients aged 30 to 80 years presenting with closed intertrochanteric fractures featuring unstable lateral walls.

Inclusion And Exclusion Criteria:

Patients were excluded if they presented with femoral neck fractures, pathological fractures, compound injuries, intact lateral walls, or significant comorbidities precluding surgery.

Surgical Technique And Rehabilitation:

All patients provided informed consent and underwent surgery under appropriate anaesthesia. The fracture was reduced and fixed using a PFN augmented with a TSP. Postoperative care included prophylactic antibiotics and drain removal by the third day. Physiotherapy commenced between the second and third postoperative days based on patient tolerance.

Outcome Assessment:

Follow-up evaluations occurred at 3 weeks, 6 weeks, 3 months, 6 months, and 9 months. Clinical assessment utilized the Harris Hip Score (HHS) at 6 weeks, 3 months, and 6 months. Radiographic union and mobility status were recorded at each visit.

RESULTS:

Demographics And Injury Mechanism

The study population consisted of 18 males (60%) and 12 females (40%), with a mean age of 60.8 \pm 14.35 years. The primary mechanism of injury was falling from height (43.33%), followed by road traffic accidents (30.00%) and assault (16.67%). The left side was involved in 53.33% of cases. Comorbidities, primarily hypertension and diabetes mellitus, were present in 60% of the cohort.

Surgical And Radiographic Outcomes

Radiographic assessment of reduction quality revealed "Good" reduction in 20 patients (66.67%), "Acceptable" in 8 (26.67%), and "Poor" in 2 (6.67%). Fracture union was achieved with a mean time of 10.4 weeks.

Functional Outcomes (Harris Hip Score)
Functional recovery demonstrated a clear upward trajectory:
1 Month: 80% of patients had an HHS <70.
3 Months: 60% of patients scored between 71–80.
6 Months: 46.67% achieved excellent scores (91–100), and 33.33% achieved good scores (81–90).

Complications:

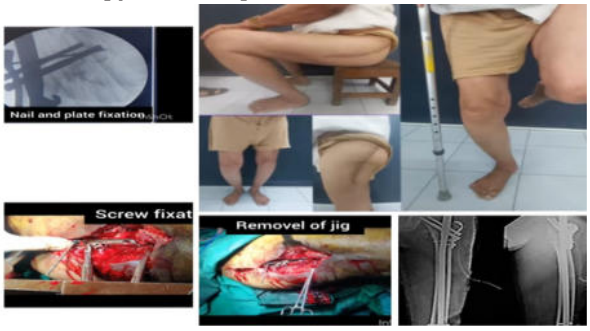
The overall complication rate was low. At the 6-month follow-up, observed complications included:
Screw migration: 10.00%.
Anterior hip pain: 6.67%.
Z/Reverse Z effect: 6.67%.
Impingement: 6.67%.
Superficial infection: 3.33%.
Notably, there were zero cases of implant failure or avascular necrosis.

DISCUSSION:

This study reinforces the utility of lateral wall reconstruction in unstable intertrochanteric fractures. The demographic

profile, favoring elderly males (61–80 years), aligns with literature suggesting osteoporosis and fall risks as primary drivers. While some studies report female predominance, our male-majority findings are consistent with reports by Raja RSB et al..

The surgical outcomes highlight the mechanical benefits of the TSP. Good to acceptable reduction was maintained in over 93% of cases, supporting the theory that lateral wall augmentation prevents loss of reduction. The mean hospital stay was short (6.7 days), facilitating the early mobilization necessary for geriatric patients. Functionally, the significant improvement in HHS-rising from a mean of 65.27 at 1 month to 84.15 at 6 months-mirrors findings by other authors who advocate for lateral support to ensure biomechanical stability. The absence of implant failure in this series is a critical finding, distinguishing this dual-implant technique from PFN monotherapy in unstable patterns.



Limitations:

The study is limited by a small sample size (n=30), a relatively short follow-up period of 6 months, and the lack of a control group treated with PFN alone. Future multicentric randomized trials are necessary to confirm long-term implant survivorship.

CONCLUSION:

The combination of a Trochanteric Support Plate with a Proximal Femoral Nail is a reliable and effective strategy for managing unstable intertrochanteric femur fractures with lateral wall comminution. This approach safeguards against fracture collapse, ensures proper alignment, and facilitates early rehabilitation, yielding good to excellent functional outcomes.