VOLUME-9, ISSUE-6, JUNE-2020 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Orthopaedic

FUNCTIONAL OUTCOME COMPARISION OF INTERTAN NAIL Vs. PROXIMAL FEMORAL NAIL IN PROXIMAL FEMORAL FRACTURE

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ABSTRACT Incidence of peritrochanteric fractures has increased significantly during recent decades and this tendency will probably continue in near future due to rising age of population. Closed methods of treatment for these fractures have shown higher mortality rates & have largely been abandoned. Rigid internal fixation and early mobilization has been standard method of treatment. This study is intended to compare the results of surgical treatment of proximal femoral fractures by intertan nail and proximal femoral nail. This is a prospective study of 40 cases of proximal femoral fractures treated with standard AO PFN and Intertan nail. In this study13 excellent, 5 Good and 2 Fair results in Intertan group with no poor results and in PFN group 11 excellent, 5 Good, 3 Fair and 1 poor results were obsereved. In our series of 20 cases of peritrochanteric fractures treated with Intertan Nail, 18 patients had Excellent to good outcome at their final follow up. Poor outcome was not seen. 2 cases had varus union and 2 patients had displacement of fracture or split of greater trochanteric, none of which required any resurgery. The mean Harris Hip score at their final follow up was 87.5 which is comparable to international publications in the literature and has a successful outcome. From this sample study, we conclude that Intertan Nail is a good implant for the treatment of peritrochanteric fractures of femur provided optimal reduction of the fracture and good positioning of the nail and screws are achieved. The results are comparable to standard AO proximal femoral nail.

KEYWORDS : PFN-Proximal Femoral Nail. HHS-Harris Hip Score.

INTRODUCTION

Intertrochanteric fractures make up 45% of all hip fractures [1] and are the major cause of death and disability in elderly. [2] 35-40% of these fractures are unstable three and four part configurations with displacement of posteromedial cortex. The failure rates of these unstable fractures fixed with sliding hip screws averages approximately 6-32%.[1,3,4]. PFN: To avoid such complications AO/ASIF in 1997 introduced a third generation intramedullary device called Proximal Femoral Nail [5,6]. It also works on principal of controlled collapse at fracture site but being intramedullary it has short lever arm, placed closed mechanical axis of femur so it is a load shearing device [6,7,8]. The advantages of this device are less soft tissue dissection required [9,10]. Addition of 6.4 mm antirotation screw to reduce rotation of cephalocervical fragment [11,6]. It facilitates early mobilization [6,12, 13]. Longer implant length, small & higher level placed valgus **angle** [11], Small diameter & fluting tip reducing stress riser effect [14]. Well documented complications include varus fixation, screw cutout, z effect, reverse z effect, femur fractures, non union, implant related problems such as inability to put in antirotation screw.[5] Intertan Nail : The TRIGEN INTERTAN nail (Smith & Nephew, Memphis, Tennessee) , according to the manufacturer the shape of the nail should enhance stability and offer greater resistance to implant cutout. Interlocking head screws could prevent z effect and provide compression at fracture site, slits at the end of the nail could prevent post operative femur shaft fractures.[15,16,17] Intramedullary nails with two lag screws were designed to improve rotational control and bony purchase within the femoral head, thus resisting cutout and subsequent fixation failure[18]. This implant design, however, has led to the recognition of a new failure pattern—the Z-effect phenomenon— which manifests as collapse of the head/neck fragment resulting in protrusio of the superior lag screw and migration of the inferior lag screw lateral to the nail. [5,11].Although some authors have theorized that medial cortex comminution and varus positioning of the fixation contribute to the Z-effect, the exact etiology of the differential screw migration has yet to be determined. A reverse Z-effect has also been described in cases treated with two lag screw intramedullary nail designs, with lateral migration of the superior hip screw requiring implant removal. [18,5,11] The TRIGEN INTERTAN nail (Smith & Nephew, Memphis, Tennessee) according to the manufacturer the shape of the nail should enhance stability and offer greater resistance to implant cutout.[15] The aim of the present randomized controlled trial was to compare the functional outcome of INTERTAN nail with the standard proximal femoral nail.

MATERIAL AND METHODS:

In this study 40 cases of peritrochanteric fractures were included, as per randomised control and inclusion, exclusion criteria's. 20 cases were treated using Intertan nail and other 20 using standard AO proximal femoral nail. Written and informed consent obtained. They were then subjected for radiographs of pelvis with both hips antero posterior view and full length thigh antero posterior view. To patients injured limb skin traction with Bohler - Braun frame applied till surgery. Appropriate preoperative investigations done and surgical fitness was obtained. All the patients were operated on a fracture table in supine position under image intensifier control using standard techniques. Patients were discharged on the 3rd to 5th post-operative day. Patients were assessed clinically and radiologically on the 2nd post-operative day, at 6 weeks, 3 months and then between 5-6 months. These findings documented according to a protocol that was developed. Healing was judged by both clinical (pain & motion at fracture site) and radiological (bridging callus filling the fracture site or trabeculations across the fracture site) criteria and functional outcome was assessed according to the Harris Hip score (modified). All comparative results were analysed statistically to find significant outcome difference.

RESULTS AND DISCUSSION:

In this study following observations were made. The Mean duration for union in Intertan group was 16 Weeks with range from 16-20 weeks. The Mean duration for union in PFN group was 18 Weeks with range from 18-24 weeks. Non-union was seen in 0 cases in intertan group and 1 Case in pfn group. Statistically there was no significant difference in rate of union in both the groups. Functional harris hip score was excellent in 13, good in 5 and fair in 2. in Intertan group

with no poor results. In PFN group there were 11 excellent, 5 Good, 3 Fair and 1 poor results .Although there were better functional results (Harris Hip Score) in Intertan group when compared to PFN group the difference was not statistically significant. The mean Functional score (HHS) for Intertan group was 87.5 and in PFN group was 83.95. Varus Union was seen in 2 cases in intertan group and 1 Case in pfn group. Overall, we found comparable results between patients treated with the INTERTAN nail and those treated with PFN. Both groups had similar pain scales at the time of early postoperative mobilization. No significant differences in pain, function, quality of life, or complication rates was evident at three or six months postoperatively. This is in conformity to recent studies and meta-analyses. **[19,20]** The mainstay change in the intertan implant is interlocking screws in the head to prevent z and reverse z effect. We in our study did not observe any case of z effect or reverse z effect in intertan group but this effect was noted in pfn group however in just 1 case. This may arise due to the poor bone density of the femoral head which limited screw purchase and reflects one of the many problems associated with fixation in elderly, osteoporotic bone . The sample size taken in this study was small but we can largely conclude that the intertan nail did prevent z effect, however still important is the proper placement of implant.

Table No1. Harris Hip Score Functional

Functional HarrisHip Score (Modified)	Intertan Nail		PFN	
	No of cases	Percentage	No of cases	Percentage
Excellent	13	65	11	55
Good	5	25	5	25
Fair	2	10	3	15
Poor	0	0	1	5
Total	20	100	20	100
P-value(fisher'sexacttest)		0.713(NotSignificant)		
Pvalue<0.05-statistically significant Pvalue<0.05-statistically not significant				

Table No 2 Union Rate Between Intertan Nail And PFN

Signs of union	IntertanNail		PFN	
	No of cases	Percentage	No	Percentage
16weeks	14	70	0	0
18weeks	0	0	15	78.95
20weeks	6	30	0	0
24weeks	0	0	4	21.05
Total	20	100	219	100
p-value(fisher'sexacttest)		0.272(NotSignificant)		
Pvalue<0.05-statistically significant Pvalue<0.05-statistically not significant				

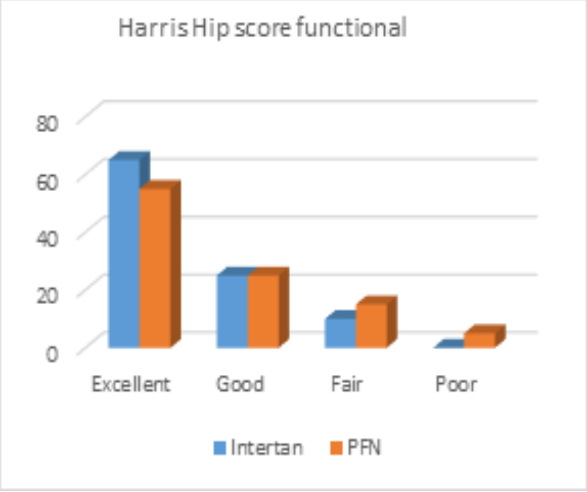

Chart No 1

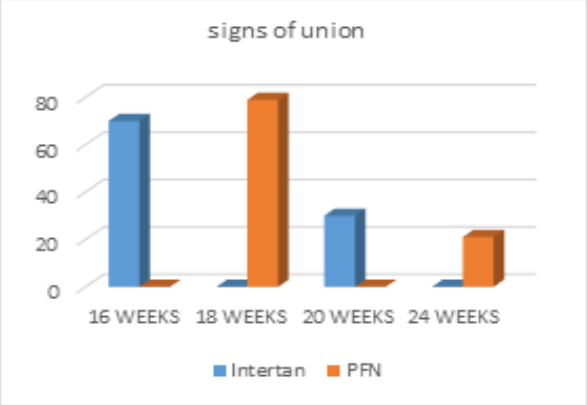

Chart No 2

CONCLUSION

From this sample study, we conclude that Intertan Nail is a good implant for the treatment of intertrochanteric and subtrochanteric fractures of femur provided optimal reduction of the fracture and good positioning of the nail and screws are achieved. The results are comparable to AO proximal femoral nail. The sample size taken in this study was small but we can largely conclude that the intertan nail did prevent z effect, however still important is the proper placement of implant. The postoperative complications, re-operation rates in our study were lesser than that we encountered in studies where other nails (Gamma nail, Trochanteric Gamma Nails) were used.

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