Original Research Article

A comparative study of functional outcome of dynamic compression plating versus interlocking nailing for fracture shaft to humerus at tertiary health care center

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Abstract

Background: Most diaphyseal fractures can be managed conservatively and good results achieved in most cases. **Aims and Objective:** To Study Functional Outcome Of Dynamic Compression Plating Versus Interlocking Nailing For Fracture Shaft To Humerus At Tertiary Health Care Center. **Methodology:** This was a cross-sectional study carried out in the patients presented with Fracture Shaft To Humerus during the one year period i.e. June 2018 to June 2019 in the one year period there were 50 patients enrolled to study by written and explained consent 25 were given surgical treatment by Dynamic Compression Plating (DCP ,n=25) and remaining 25 by Interlocking Intra-medullary Nailing (IMN,n=25) . The statistical analysis was done by Chi-square test, unpaired t-test and calculated by SPSS 19 version software. **Result :** In our study we have seen the average age in both the group was comparable i.e. 45.23 ±3.42 Yrs. and 44.56± 4.39 ($p>0.05$,$t=0.82$,$df=49$) and Male to Female ratio was also comparable i.e. 1.5 : 1 and 1.08:1($p>0.05$, $X2=0.25$,$df=1$) .The most common complication were Impingement 12% Vs 20%; Shoulder stiff 8% Vs 12%; Stiff Elbow 8% Vs 12%; Infection 8% Vs 8% and overall the complications were comparable respectively in DCP and IMN groups ($X2=1.662$,$df=7$,$p>0.05$). Overall Excellent results were 68% Vs 40%, Moderate 28% Vs 32%; Poor 4% Vs 28% respectively in DCP and IMN Group ($X2=6.38$,$df=2$,$p<0.04$) .**Conclusion:** It can be concluded be concluded from our study that Functional Outcome of DCP were superior as compared to Intra medullary Nails with respect to excellent outcome where as complications were comparable in both the groups.

Key Words: Dynamic Compression Plating, Interlocking Nailing, Fracture Humerus.

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INTRODUCTION

Most diaphyseal fractures can be managed conservatively and good results achieved in most cases.[1] However loss of reduction in the plaster cast invariably leads to malunion. Operative treatment for humerus fractures has usually been reserved for cases of delayed union, non-union, or malunion following conservative management.[1] The advantage of operative management is early mobilization and patients comfort. Surgical stabilization can be accomplished with different implants and techniques; the most common are open reduction with plate fixation or stabilization with intramedullary nails. Both techniques have certain mechanical and anatomical advantages and disadvantages. [1] Plating gives good results but disadvantages that it requires extensive dissection and radial nerve protection.[2] The plate may fail in osteoporotic bone hence locking plate is advisable. With the dynamic success of intramedullary fixation of

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fractures of the femur and tibia, there was speculation that this technique might be more appropriate for humerus shaft fracture than plating.[1] Intramedullary nails have the advantage of closed insertion techniques, intact periosteal blood supply, and load-sharing mechanical properties.[1] But unfortunately the success of interlocking nailing in long bones of lower limbs is not seen in humerus hence we have done study to see the outcome of two treatment methods for the fracture of humerus at tertiary health care centre

METHODOLOGY

This was a cross-sectional study carried out in the patients presented with Fracture Shaft To Humerus during the one year period i.e. June 2018 to June 2019 in the one year period there were 50 patients enrolled to study by written and explained consent 25 were given surgical treatment by Dynamic Compression Plating (DCP ,n=25) and remaining 25 by Interlocking Intra-medullary Nailing(IMN,n=25) . All details of the patients like age, sex and complications if any and out come was assessed by Rommens *et al* Series grading* Into Excellent, Moderate ,Poor . The statistical analysis was done by Chi-square test, unpaired t-test and calculated by SPSS 19 version software.

RESULT

Table 1: Distribution of the patients as per the age and sex

	DCP (n=25)	ILN (n=25)	p-value
Age	45.23 ±3.42	44.56± 4.39	p>0.05,t=0.82,df=49
Sex			
Male	15	13	p>0.05, X^2=0.25,df=1
Female	10	12	

The average age in both the group was comparable i.e. 45.23 ±3.42 Yrs. and 44.56± 4.39 (p>0.05,t=0.82,df=49) and Male to Female ratio was also comparable i.e. 1.5 : 1 and 1.08:1(p>0.05, X^2=0.25,df=1)

Table 2: Distribution of the patients as per the complications

Complications	DCP (n=25)	IMN (n=25)
None	12(48)	9(36)
Impingement	3(12)	5(20)
Shoulder stiff	2(8)	3(12)
Stiff Elbow	2(8)	3(12)
Infection	2(8)	2(8)
Open reduction	2(8)	1(4)
Splintering of DF	1(4)	1(4)
Non-union	1(4)	1(4)
Wrist drop	25(100)	25(100)

(X^2=1.662,df=7,p>0.05)

The most common complication were Impingement 12% Vs 20%; Shoulder stiff 8% Vs 12%; Stiff Elbow 8% Vs 12%; Infection 8% Vs 8% and overall the complications were comparable respectively in DCP and IMN groups (X^2=1.662,df=7,p>0.05)

Table 3: Distribution of the patients as per the outcome of treatment

Outcome	DCP (n=25)	IMN (n=25)
Excellent	17(68)	10(40)
Moderate	7(28)	8(32)
Poor	1(4)	7(28)

(X^2=6.38,df=2,p<0.04)

Overall Excellent results were 68% Vs 40%, Moderate 28% Vs 32%; Poor 4% Vs 28% respectively in DCP and IMN Group (X^2=6.38,df=2,p<0.04) .

DISCUSSION

Incidence of Shaft Of Humerus Fractures Is 1% To 3% Of All Fractures [3-5] In The Human Body And 20% Of All Fractures Of Humerus [6]. The Common Causes Of Shaft Of Humerus Fractures In The Elderly Patients Are Simple Falls Or Rotational Injuries. In Younger Population, The Causes Are High Energy Trauma Like Road Traffic Accident And Fall From Height. There Are So Many Treatment Modalities For Shaft Of Humerus Fracture Depending On The Age Of The Patient, Fracture Pattern, Soft Tissue Condition, Bone Quality And Associated Complications Of The Patient. Treatment Options Include Conservative and Operative Treatment. Conservative Methods Include U Slab, Hanging Cast, Sling And Body Bandage, Velpeau Bandage And Functional Bracing [7]. Most Of The Shaft Of Humerus Fracture Cases Can Be Treated Conservatively With Good Results. However There Are Certain Cases Which Are Best Treated With Operative Techniques. Indications For Operative Treatment Are Open Fracture, Non-Union, Malunion, Failure After Conservative Treatment, Polytrauma Patient, Fractures Associated With Neurovascular Impairment Or Intra Articular Extension.[8] Operative Treatment Include Plate And Screws, Intramedullary Nail. Intramedullary Nails Can Be Inserted Either By Antegrade Or Retrograde Manner. Intramedullary Nailing Has The Disadvantages Of Rotator Cuff Injuries, Joint Stiffness And Joint Morbidity. Open Reduction And Internal Fixation (ORIF) Has The Advantages Of Good Reduction, Stable Fixation, Rotational Stability And Early Mobilization Most surgeons agree that intramedullary nailing is not best fixation for humerus shaft as compare to tibia and femur shaft fracture. Plate osteosynthesis requires extensive soft tissue dissection with the risk of radial nerve damage5 and infection. The indication s for open reduction and internal fixation of acute fractures of the humeral shaft have been described as open fractures, fractures associated with vascular or neural injuries or with lesions of the shoulder, elbow or forearm in the same limb; bilateral upper extremity

injuries, fractures for which closed methods of treatment have failed and pathological fractures, fractures in patients with multiple injuries.[9,10,12,13] In our study we have seen the average age in both the group was comparable i.e. 45.23 ±3.42 Yrs. and 44.56± 4.39 ($p>0.05$,$t=0.82$,$df=49$) and Male to Female ratio was also comparable i.e. 1.5 : 1 and 1.08:1($p>0.05$, $X^2=0.25$,$df=1$) The most common complication were Impingement 12% Vs 20%; Shoulder stiff 8% Vs 12%; Stiff Elbow 8% Vs 12%; Infection 8% Vs 8% and overall the complications were comparable respectively in DCP and IMN groups ($X^2=1.662$,$df=7$,$p>0.05$) Overall Excellent results were 68% Vs 40%, Moderate 28% Vs 32%; Poor 4% Vs 28% respectively in DCP and IMN Group this observed difference was statistically significant ($X^2=6.38$,$df=2$,$p<0.04$) These findings are similar to Yash B. Rabari [14] they found that Dynamic compression plating is preferable technique than interlocking nailing for fracture shaft of humerus in adults.

CONCLUSION

It can be concluded be concluded from our study that Functional Outcome of DCP were superior as compared to Intra medullary Nails with respect to excellent outcome where as complications were comparable in both the groups.

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