

# COMPARATIVE STUDY BETWEEN DELTOID SPLIT (MIPPO TECHNIQUE) AND DELTOPECTORAL APPROACH PHILOS PLATE FIXATION IN NEERS TYPE 2 AND TYPE 3 PROXIMAL HUMERUS FRACTURES

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## *Abstract-*

**Introduction:** Proximal humerus fractures is the most common fracture in shoulder girdle in adults. Surgical treatment is increasing with PHILOS using Delto-pectoral or Deltoid splitting approaches.

**Aims:** To compare the outcome of PHILOS plating using the two approaches that is deltopectoral and deltoid split.

**Materials and methods:** Patients (n=22) with proximal humerus fractures, analysed prospectively, managed surgically using the two approaches, delto-pectoral (n=11) and Deltoid split (n=11). Results analyzed on the basis of Constant-Murley Score at minimum follow-up period of 6 months.

**Results:** The mean Constant-Murley Score in Delto-pectoral group is 71.6 compared to 73.90 in Deltoid split group (p=0.04). The time to union in the two groups being 12 weeks average being 10 to 14 weeks in both the approaches.

**Conclusion:** The results in the two groups were comparable. So overall, we can say that in proximal humerus AO 2 and 3 deltoid splitting approach(mippo) is a better and easy method of osteosynthesis with better outcome in terms of ease of technique, blood loss, wound healing, range of movement with minimum dissection.

**Keywords:** PHILOS, Delto-pectoral, deltoid split, proximal humerus.

## 1.INTRODUCTION

Fractures of proximal humerus includes fractures at or proximal to surgical neck of humerus. It is the most common fracture in shoulder girdle in adults [1]. Majority of proximal fractures can be treated non-operatively, though surgical treatment is increasing with fracture reconstruction increasing at higher rate than prosthetic replacement [1-3]. Several clinical studies have shown higher rates of healing and functional outcomes with proximal humerus locking plate [4-14]. Deltopectoral approach has gained increasing popularity as it has greater exposure to the fracture site and provides easy reduction with and more biologically sound approach [15-17]. Deltoid split approach allow more direct access to greater tuberosity and to the area between the greater and lesser tuberosities, just lateral to bicipital groove also allowing direct manipulation of the humerus head, as well as allowing plate and screw placement in line with the incision [18, 19].

## Research Question:

Is there any difference in the functional outcomes between MIPPO technique and Deltopectoral approach PHILOS plate fixation with for Neer's type 2 and type3 proximal humerus fractures.

## Materials and methods

22 patients were included having proximal humerus fracture, who underwent open reduction and internal fixation with proximal humerus locking plate during period march 2020 to nov 2022 at Pt JNM Medical College & DrBRAM Hospital,Raipur. Minimum follow-up period being 3 months. Adult Patients were included with closed fractures and 2 and 3 part fracture as per Neer Classification.Those with Humeral head fractures, open or pathological fractures, those with failed conservative treatment were excluded. The results shows male number wise and percentage for DP 7 & 63.63% and female 4 & 36.37 % and for DS male is 8 & 72.72% and female is 8 & 27.28%. and value of p =0.86NS.

The mode of injury for DP, DS with RTA and Fall values number or percentage wise. Got the value For DP RTA is 4 ,36.36%,for DS RTA value 6 , 54.54% & for DP Fall value 7,63.64%, for DS value 5,45.46% and the Value of p=0.63NS.

The Part/Type wise distribution of the Proximal humerus fractures patients is among 11 DP and 11 DS partwise patients , type were categorized into two groups: 1) neers type 2 DP & DS number and percentage wise (5,45.45% & 7,63.63%), 2) ) neers type 3 DP & DS number and percentage wise (6,54.55% & 4,36.37%) and p value is 0.43 NS.

Out of 22 patients 11 were operated with delto-pectoral approach and 11 with deltoid- splitting approach. Image intensifier was used intra-operatively with fixation using PHILOS plate in all patients. Non-absorbable Polyester suture (Ethibond) no. 5 used to augment fracture fixation as per fracture anatomy. ~ 178 ~ International Journal of Orthopaedics Sciences Standard surgical approaches as per literature were used. Deltopectoral approach, classically described as incision starting over coracoid process and advanced over the deltopectoral groove with lateral reflection of cephalic vein. It can be modified with incision starting over the clavicle directed over 1-2cm lateral to coracoid process towards a point at midline of anterior arm 2cm distal from the axillary crease, allow improved exposure. Advantage of working through internervous plane with wide exposure. But require significant soft tissue dissection to gain access to lateral aspect of proximal humerus for fracture reduction and plate fixation, which may affect humerus head vascularity [19- 20]. In Deltoid splitting approach, longitudinal incision is given at the raphe between anterior and middle deltoid. This interval is divided with a vertical 4 cm incision starting at the anterolateral corner of acromion.

The axillary nerve can be identified at an average 5cm distal to acromion. As the nerve crosses the anterior raphe as single branch, innervations of anterior deltoid can be preserved by protecting it during dissection. Once identified, the raphe may be further split distal to the nerve to allow access to the lateral shaft for plate placement. The deltoid split approach has two major disadvantages. In antero-inferior fracture dislocations, the humerus head fragment may not be accessible, other is chance of Axillary nerve injury. PHILOS plate was placed about 5 to 10 mm distal to the tip of greater tuberosity (confirmed under image intensifier) and just lateral to bicipital groove. Post-operative care: Patients followed-up at 2 weeks, 6 weeks, 12 weeks after surgery. Immobilized for 6 weeks in sling with active range-of-motion exercises of elbow, wrist and hand encouraged.

Depending upon fracture pattern and stability that was achieved, passive range of motion started between 2 and 4 weeks after surgery with forward elevation, external rotation and pendulum exercises. If healing progressed adequately both clinically and radiologically at 6 weeks active assisted range of motion is started. Patients were evaluated on Constant-Murley Score[20] at final follow-up, ranging 12-35 months, mean 19 months.

**RESULT AND DISCUSSION**

CONSTANT MURLEY SCORE	DELTOPECTORAL APPROACH	DELTOID SPLIT APPROACH
Excellent(86- 100)	2	3
Good(71-85)	4	5
Fair(56-70)	5	2
Poor(<55)	0	1
Total	11	11

The following table showing constant murley scoring after 6 months of follow up in both the approaches. ConstantMurley score Deltopector apprpach al Deltoid split approach Excellent(86- 100) 2 3 Good(71-85) 4 5 Fair(56-70) 5 2 Poor(0.05) [21]. Solberg et al and Siwach et al reported Constant-Murley Scores between 61 to 80 [22]. The mean time for union in delto-pectoral and deltoid split approaches were approximately 12 weeks



**POST OPERATIVE X-RAY AFTER 6 MONTH**



**(FUNCTIONAL OUTCOME AFTER 6MONTH FOLLOW UP)**



**CONCLUSION:**

The results in the two groups were comparable. So overall we can say that in proximal humerus AO 2 and 3 deltoid splitting approach (mippo) is a better and easy method of osteosynthesis with better outcome in terms of ease of technique, blood loss, wound healing, range of movement with minimum dissection.

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