A COMPARISON OF PRONATOR QUADRATUS-SPARING APPROACH AND THE CONVENTIONAL APPROACH FOR INTERNAL FIXATION OF DISTAL RADIAL FRACTURES USING VOLAR LOCKING PLATE

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Introduction

Distal radius fractures represent the most prevalent type of fracture in the upper limb, occurring at a rate of 2 fractures for every 1,000 person-years. Over the past 25 years, the use of open reduction and internal fixation for distal radius fractures has grown significantly, with a notable rise in the popularity of volar plating. This method yields superior functional and radiological outcomes in comparison to alternative surgical techniques. To properly place the volar plate at the fracture site, the surgeon must separate the pronator quadratus muscle from its distal and radial attachments and elevate it to achieve optimal visibility of the fracture.

The Pronator Quadratus-Sparing Approach represents a less invasive and destructive surgical technique. An intact pronator quadratus serves as an effective barrier against prominent hardware and superficial infections. Following the procedure, patients demonstrated a swift recovery of grip strength, with minimal disruption to their rotational motion.

Aim of the Work

The aim of this study was to compare between the results of Pronator Quadratus-Sparing approach and conventional approach for volar plating of distal radial fractures.

Patients and Methods

Patients:

A total of 40 patients were included in the study. The patients were randomly allocated to group A (Pronator quadratus-sparing approach) or B (Conventional approach).

Methods:

Consents were obtained from all patients, followed by clinical and radiological evaluation. The Pronator Quadratus-Sparing approach is a surgical technique used for distal radius fractures. After exposing the PQ muscle, fracture reduction was performed under fluoroscopy, with a K-wire placed through the radial styloid to stabilize the fracture. A subperiosteal retrograde release of the PQ muscle was done, and the muscle belly exfoliated to reduce palmar bone fragments.

A locking plate was inserted retrograde beneath the PQ muscle, with the distal end at the watershed zone. Screws were placed through a mini-incision in the PQ muscle into the oblong plate hole. Locking screws were inserted into the distal and proximal plate holes to provide subchondral support. The distal border of the PQ muscle was repaired and the temporary K-wires were removed.

Results

Table 1: Comparison between the studied patients group regarding the final Modified Mayo Wrist Score category.

The Modified Mayo Wrist Score category	Group A		Group B	
	No	%	No	%
Excellent	14	70.0	6	30.0
Good	6	30.0	13	65.0
Fair	0	0	1	5.0
X^2 P value	5.758 0.043*			

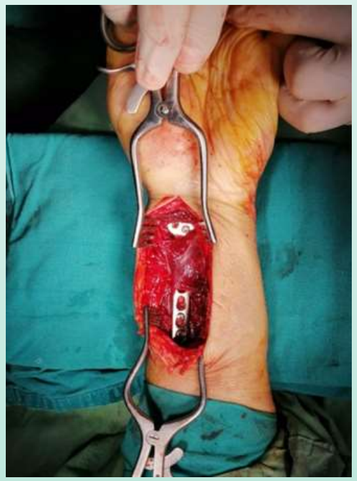

Table 2: Comparison between the two studied groups regarding range of motion at the end of the follow up period (6 months).

Range of Motion 6 months	Group A	Group B	t-test P value
Flexion			
Range	70-79	69-76	0.006*
Mean±SD	74.25±2.7	72.2±2.2	
Extension			
Range	64-74	63-69	0.001*
Mean±SD	69.1±2.3	66.25±1.8	
Supination			
Range	80-89	80-89	0.088
Mean±SD	85.35±2.5	84.3±2.3	
Pronation			
Range	77-85	72-80	0.001*
Mean±SD	82.4±2.8	76.2±2.6	
Ulnar deviation			
Range	29-36	24-35	0.232
Mean±SD	32.55±2.6	31.9±3.0	
Radial deviation			
Range	16-20	14-20	0.095
Mean±SD	17.9±1.4	17.2±1.9	

Figure 1: Pronator quadratus-sparing approach.

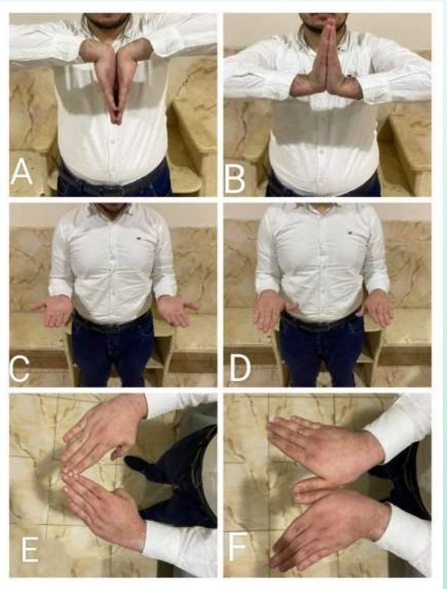

Figure 2: Range of movements at the end of follow up. Final Modified Mayo Wrist Score = 100& excellent result

(A) Flexion
(B) extension
(C) supination
(D) pronation
(E) radial deviation
(F) ulnar deviation.

Conclusion

From the results of this study, it was concluded that:

1- The pronator quadratus-sparing approach has better results all over the period of follow up in the range of wrist motion (flexion, extension, and pronation).
2- The pronator quadratus-sparing approach has better results all over the period of follow up in Grip strength.