Morphology Of Volar Surface Of Distal Radius

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INTRODUCTION:

Incidence of distal end radius fracture is the highest among the upper limb fractures accounting for 15% of all the fractures. In 1995, Volar fixed angle plate was first introduced by Putnam and Gesensway with SCS distal volar radius plate system as a new device in comminuted distal end radius fixation. However, there are a few complications related to the plating of radius over volar aspect. For example, irritation of the volar tendons, compression of median nerve and so on. One of the common etiologies to cause flexor tendon irritation is due to the location of plating which was placed distal to watershed line. However, after practicing fixing of plate proximal to watershed line, the complication such as tendon irritation still occurred. So, we hypothesize that there is anatomical variation of the volar surface of distal radius in Malaysian population which does not match the design of implants produced based on European population.

METHODS:

This study analyses morphological characteristics of the volar surface of the distal radius by using CT scans.

51 patients with no congenital deformity or traumatic history were recruited in the study. 51 patients underwent CT scan to obtain the images of both wrists. The CT scan images were then processed using Mimics software to obtain 3D images. Measurements of the vertical cortical angle over the volar surface of both wrists in 51 patients was done using 3Matic software from the 3D images. Measurements of angle was also done over the distal medial and lateral part of volar surface of radius. The same technique of measurement was repeated by another assistant who is familiar with the software. A total of three sets of measurements were done to confirm the technique of measurement is duplicable and reproducible.

RESULTS:

There were total of 51 volunteers, 27 were females and 24 males. Out of these 51 patients, 29 were Malays, 21 were Chinese and 1 was Indian. Mean angle of the left medial-radius is 30.88±6.11 and for the right side is 30.12±7.26. Whereas mean angle for the left lateral-radius is 21.12±6.11 and the right is 23.45±7.26. Angle difference between medial-radius and lateral-radius is 14.54±4.81 over left side and 14.71±7.35 over right side.

	Mean (degrees)	Std. Deviation (degrees)
Radius – Medial	149.4440	6.69460
Radius – Lateral	157.7131	14.89861
Angle Between Medial & Lateral of Radius (M&L)	166.3787	6.27628

Table 1: Mean Angle of distal Radius

DISCUSSIONS:

Different population have different cortical angle. Malaysian have different vertical cortical angle as compare to other nations like Korea, Japan. Developed our owe method to measure vertical cortical angle.

CONCLUSION:

Different populations have different vertical cortical angle.

REFERENCES:

1. Pichler, W., Clement, H., Hausleitner, L., Tanzer, K., Tesch, N. P., & Grechenig, W. (2008). Various circular arc radii of the distal volar radius and the implications on volar plate osteosynthesis. *Orthopedics, 31*(12).