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A Retrospective Study of Ulnar Variance in A Tertiary Care Hospital of North Karnataka

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Abstract
Numerous wrist disorders may be influenced by ulnar variance, where ulnar variance is the height differential between the ulna and distal radius joint articulating surfaces. To measure ulnar variance in patients visiting a tertiary care hospital of north Karnataka with complaints of wrist pain with the method of perpendiculars. Ulnar variance was measured in 100 patients who visited our hospital with complaints of wrist pain where plain radiograph of wrist PA in neutral position was taken for the patients above the age of 18 and then ulnar variance was measured using method of perpendiculars. The mean ulnar variance has been observed to be 0.23mm with no significant statistical age and gender distinctiveness and has shown a positive ulnar variance dominance among the subjects of population belonging to north Karnataka. This study of ulnar variances will help in identifying various wrist pathologies on X-ray with correlation of clinical symptoms.

INTRODUCTION

The distal radioulnar joint is crucial to the wrist's function and, by consequently, the upper extremity's overall functionality. The distal radius, ulna and ulnar carpus have specific anatomic connections and even slight alterations to these interactions can result in notable load shifts and pain syndromes[1].

Ulnar variance which also known as Hulten variance[2]. is the height differential between the ulna and distal radius joint articulating surfaces. Where if ulna is placed more distally its called positive variance and if placed more proximally its known as negative variance. The length of the ulnar styloid process has no bearing on ulnar variation[2].

A positive ulnar variance is associated with ulnar impaction syndrome where as a negative ulnar variance is associated with keinbock disease and ulnar impingement syndrome[3].

There is ongoing debate over the associations between side and ulnar variation, age, gender and side. However, freedman[4]. Found no signficant associations between age, gender and side.

There are few methods of calculating ulnar variance of which method of perpendiculars has been proved to be more reliable for the measurement of ulnar variance[5].

MATERIALS AND METHODS

A Retrospective analysis was done to investigate ulnar variance in the comparison of age, gender and side of the patients visited our hospital with the compliants of wrist pain from January 2024-march 2024. 100 patients were taken in for the study above the age of 18 irrespective of their age, gender and side of the wrist by taking plain PA view radiographs of wrist with wrist in neutral forearm rotation, the elbow flexed 90° and the shoulder abducted 90°. Ulnar variance is calculated by using the methods of perpendiculars[5] where firstly, a line was drawn on the radius's longitudinal axis. Subsequently, a line was drawn perpendicular to the first line at the apex of the distal cortical rim of the ulnar aspect of the radius and another line at the apex of the distal cortical rim of the ulna. Then, the separation between these two lines was measured [Fig-1]. After the measurements were done data analysis was done using SPSS version 22.0. Pearson correlation coefficient was used to find the age and ulnar variance correlation.

Inclusion Criteria:

- Patients of either gender with the complaints of wrist pain
- Patients of age above 18 years

Exclusion Criteria:

- Patients with previous/present wrist /distal forearm fractures
- Patients age less than 18 years

RESULTS AND DISCUSSIONS

The mean age of population was 38 years with age ranging from 18-58 years (Table-1).

Fig. 1: Separation between two lines measured

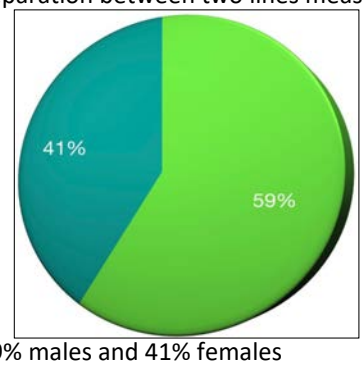

Fig. 2: 59% males and 41% females

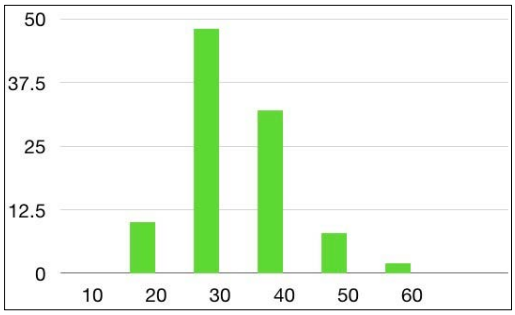

Fig. 3:50 right and 50 left wrists

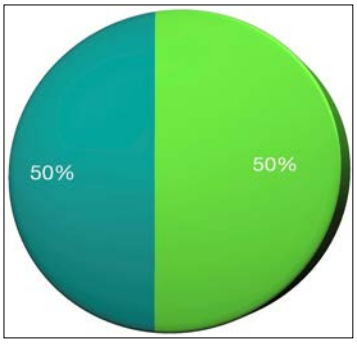

Fig. 4: with 50 right and 50 left wrists

Where there were 59% males and 41% females (Fig-2) with 50 right and 50 left wrists (Fig-3).

To provide the best possible function of the joint complex, which comprises the radiocarpal, intercarpal, and carpometacarpal joints, the distal articular surfaces of the radius and ulna must be at the same level[6]. A positive ulnar variance is associated with ulnar impaction syndrome where as a negative ulnar variance is associated with keinbock disease and ulnar impingement syndrome[3].

The load distribution between the radius and ulna in a neutral ulnar variance is 80:20 and variations in the ulnar variance have an impact on this ratio[7].

In the present study method of perpendiculars was used to measure ulnar variance. Our study has a sample size of 100 where other studies have various sample sizes Ando[8] studied 20 wrists while goldfarb[9] examined 138 wists.

The mean age in our study is 39 years. with a mean ulnar variance of 0.23mm but different authors have reported reported different values in their studies.

In the population under our research, negative ulnar variance was more common than positive ulnar variance, according to the current study. Elsaftawy[10] in his had study on 196 cases had also observed a negative ulnar variance however Schuurman[11]. in their study had documented a higher predominance of positive ulnar variance.

There was no statistial significance for age, gender and side of the wrist with re3spect to ulnar variance in the current study. However other researchers have seen significant difference between males and females as shown in study by Bonza[12].

Given the brief duration of our study, comments regarding the follow-up consequences of ulnar variance are not possible.

CONCLUSION

In our study there was a greater negative ulnar variance in the patient population belonging to tertiary care hospital in North Karnataka and there was no link with age, sex, or the side of the wrist involved.

Even though this study contains large series of the literature, more research in various cultures and ethnicities is necessary to get more precise results and to comprehend the connection between ulnar variation and certain wrist problems.

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