



Relationship between Ulnar Variance with the Quick Dash Score Assessment of Extraarticular Distal Radius Fractures at Haji Adam Malik Hospital from January 2012 - January 2017

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Abstract : Objective : Distal radius fractures represents one-sixth of all fractures in emergency ward. The correlation between radiological and functional outcomes after distal radius fractures remains controversial. It is important to know factors that affect functional outcomes after treatment of distal radius fractures.

Methods : This research is cross-sectional study that asseses the relationship between ulnar variance and Quick DASH Score in patients with extra-articular distal radius fractures Haji Adam Malik Hospital from January 2012 to January 2017. Ulnar variance assessed from PA x-rays and Quick DASH Score filled by patients. Data will be tested with computer-based system using Spearman correlation test.

Results : From a total of 7 subjects as a min sample, 21 subjects were studied with female patients 7 (33.3%) and male 14 (66.7%), youngest at 16 years and oldest at 59 years with average $38,19 \pm 14,76$ years, ORIF 20 patients (female 7 [35%], male 13 [65%]), SAC 1 patients (male 1 [100%]). UV less than 0 are female 3 and male 10 patients, UV more than 1 are 4 patients both female and male. Mean Quick DASH Score 7.77 ± 8.69 median 4.54. From data using computer-based system it was found that P 0,001 meaning there is significant difference in outcomes between the ulnar variance and the Quick DASH Score of extra-articular distal radius fractures.

Discussion : There is a relationship between ulnar variance with Quick DASH Score of extra-articular distal radius fractures at Haji Adam Malik Hospital from January 2012 to January 2017.

Keywords : Distal Radius Fractures, extraartiular, ulnar variance, Quick DASH Score.

Introduction

Fracture is partial or complete discontinuity of bone, joint cartilage, and epiphyseal cartilage. Both

physical condition of bone and mechanism of trauma is needed to know why and how the bone is fractured. Most fracture is caused by failure of bone to withstand pressure, especially bending, torsion, and stretching.¹

In Indonesia, the incidence of fracture is quite high. Based on data from the Ministry of Health of the Republic of Indonesia in 2013 found about eight million people suffered fracture with different types and different causes. They found that 25% of the sufferers of the fracture experience death, 45% have physical disability, 15% experience psychological stress such as anxiety or even depression, and 10% have heal well (MOH RI 2013). Meanwhile, according to the World Health Organization (WHO) in 2013 mentioned that traffic accidents reach 120,226 times per day or 72% in a year.²

One of the most frequent fractures is distal radius fractures. This fracture represents one-sixth of all fractures in emergency ward.^{3,4} Distal radius fractures has a bimodal distribution, with a peak in young people (18-25 years) and the second peak in the elderly (over 65 years). The injury mechanisms in each group differ, whereas in young people the cause is high-energy injuries whereas in the elderly it is caused by low-energy injuries.⁵

Currently treatment of distal radius fractures has many approaches. It is important to know the factors that affect functional outcomes after treatment of distal radius fractures because understanding these factors can help clinicians to predict prognosis, consider postoperative care and analysis of treatment outcomes.[8] The correlation between radiological and functional results after fracture of the distal radius remains controversial. Several previous studies have shown that radiographic parameters are not correlated with the functional outcomes of patients, but others suggest that radiographic parameters predict functional outcomes.⁶

There are several published scoring methods for clinical and functional assessment of upper extremity function: ASES (American Shoulder and Elbow Surgeons Standardized Shoulder Assessment form), UCLA (The University of California Los Angeles Shoulder rating Scale), The Oxford Shoulder Questionnaire, The Imatani shoulder Score, SF36. Measurements filled by patients for example DASH (Disability of the Arm Shoulder and Hand Questionnaire) and Oxford Shoulder Questionnaire. ASES is a measure filled by clinicians and patients.⁷

DASH is a responsive, valid and reliable clinical measurement tool for assessing upper extremity. This questionnaire consists of 30 questions filled by the patient himself. Questionnaires were classified into physical functions, social functions, pain and sleep disturbances.⁷

Quick DASH score is a modification of DASH. Quick DASH Score contains 11 questions making it simpler and charging time shorter. The value of the Quick DASH Score range is the same as the DASH, ie 1 (no disability) up to 5 (very severe disability). The Quick DASH Score has the same precision as the DASH for assessing upper extremity function. By knowing the results of upper extremity function in management of extracellular extraarticular distal radius fractures through a Quick DASH Score clinical assessment, is expected to reduce post-traumatic morbidity and complications.⁷

At Haji Adam Malik Hospital, researchers found many cases of distal radius fracture with various variations. From the supporting journal obtained researcher get result r (correlation coefficient) = 0.4216. From the data and description above, the purpose of this research is to find out whether there is a relationship between ulnar variance with the assessment of Quick DASH Score on the patient with extraarticular distal radius fractures at Haji Adam Malik Hospital from January 2012 to January 2017.

Experimental

This research is a cross sectional study that asses the relationship between ulnar variance with Quick DASH Score in patients with extra-articular distal radius fractures at Haji Adam Malik Hospital from January 2012 to January 2017. The research was conducted in all units of Haji Adam Malik Hospital after receiving approval from Research Ethics Committee of Faculty of Medicine University of North Sumatera. The population is all patients who have been treated at the Orthopaedi's Haji Adam Malik Hospital both inpatient and outpatient from January 2012 to January 2017.

The inclusion criteria are medical records of patients diagnosed with distal radius fracture, complete medical records, from radiological results with the diagnosis of extraarticular distal radius fracture, productive

age (16-60 years) , and patients agree to follow this study by answering the questionnaire. Exclusion criteria are incomplete medical record data, patients of distal radius fractures with other comorbids, patients who have experienced inappropriate fracture treatment before, and patients who refuse to be examined. All study subjects has been approved by research and development section of Central Hospital Haji Adam Malik. Ulnar variance assessed from PA x-rays and Quick DASH Score filled by patients. Data will be tested with computer-based system by using Spearman correlation test.

Results

Data from the medical record collected between January 2012 until January 2017. From a total of 7 subjects as a minimum sample, 21 subjects were studied until the final analysis. Data retrieval and ulnar variance counting, Quick DASH Score is done gradually with the initial stage of selecting sample subjects that enter into the inclusion criteria. Then after sufficient number of samples, patients who entered the inclusion criteria were interviewed and counting ulnar variance and Quick DASH Score.

From 21 subjects, there are female 7 patients (33.3%) and male 14 patients (66.7%). The youngest age is 16 years and the oldest age is 59 years with average of 38.19 ± 14.76 years. Distribution of the samples by type of treatment, seen the dominance of the sample derived from the ORIF operation 20 subjects (female 7 [35%], male 13 [65%]), while the non-SAC operation as 1 subject (male 1 [100%]). Distribution of the samples that have ulnar variance < 0, female counted 3 subjects and male 10 subjects while for ulnar variance > 1 for 4 female and 4 male, while for the calculation of quick DASH score from 21 subjects who underwent quick DASH score calculations were obtained for an average of 7.77 ± 8.69 with a median of 4.54.

Table 1. Statistical analysis of the relationship between ulnar variance and the assessment of Quick DASH Score in extraarticular distal radius fracture

	Mean	p value
UV	-	0,0001
QDS	7,77 ± 8,69	

UV, Ulnar Variance; QDS, Quick Dash Score

From the table above shows that there is a significant difference in outcomes between ulnar variance and Quick DASH Score assessment of patients with extraarticular distal radius fractures with p value is 0.0001 (<0.05).

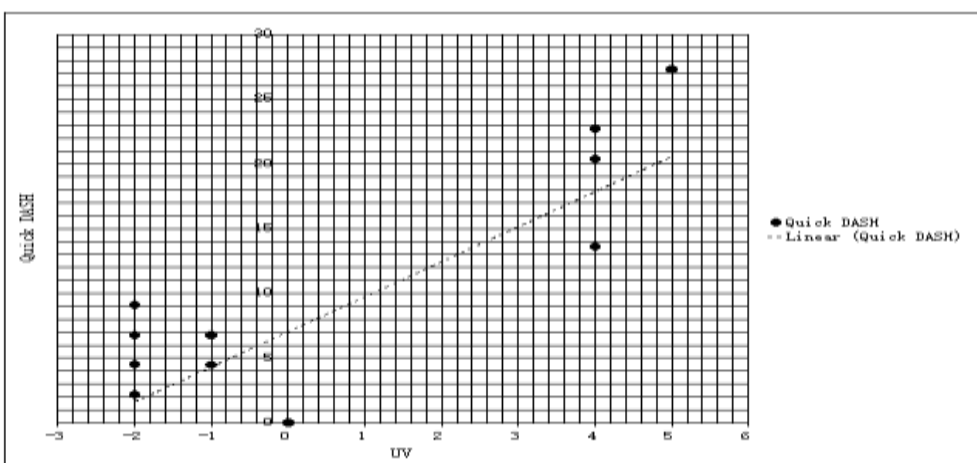


Diagram 1. Scatter plot with analysis between variables ulnar variance and Quick DASH Score

From the diagram above, it is also seen that the increasing (or positive) value of ulnar variance results in increasingly also the value of Quick DASH Score in patients fracture of extraarticular distal radius.

Discussion

The results of this study showed that there was a significant difference in the results of the association between ulnar variance and the assessment of Quick DASH Score on fracture patients with extraarticular distal radius with p value is 0.0001 (<0.05).

This is similar to Lee⁹ obtaining patients with a positive ulnar variance after surgery had a worse DASH score. Ulnar variance positive can decrease grip strength, cause wrist pain, and worsen the DASH score. An increase in ulnar variance 1 mm after surgery was associated with an increase in DASH score of 1.4 points in the year following surgery.

This is also similar to Kodama.¹⁰ Volar tilt and ulnar variance have significant correlation with clinical outcomes. Clinical outcomes significantly worsened when the parameters exceeded the tolerable range where better clinical outcomes were found in patients with $-5^\circ \leq VT < 0^\circ$, $VT \geq 0^\circ$, and $UV < 3$ mm. These two parameters may be related to the function of the wrist and daily activities.

Conclusion

There is a relationship between ulnar variance with Quick DASH Score in patients extra-articular distal radius fractures at Haji Adam Malik Hospital from January 2012 to January 2017

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