The circles measurement - the new gold standard to diagnose acromioclavicular joint dislocations?

Philipp Vetter[1], Larissa Eckl, Frederik Bellmann, Laurent Audige[2], Markus Scheibel
[1]Schulthess Clinic, [2]Shulthess Klinik

INTRODUCTION:

Classification and treatment of acromioclavicular joint (ACJ) dislocations according to the Rockwood classification is controversial. The "circles measurement" on Alexander views was proposed to enable a clear assessment of displacement in ACJ dislocations. However, the method and its ABC classification were introduced on a sawbone model based on exemplary Rockwood scenarios, limiting its clinical utility.

This is the first in-vivo study to investigate the "circles measurement". We aimed at comparing this new measuring method to the Rockwood classification and the previously described semi-quantitative degree of dynamic horizontal translation.

METHODS:

100 consecutive patients (87 male, 13 female) with acute ACJ dislocations between 2017 and 2020 were included. Mean age was 41 years (range, 18-71). ACJ dislocations on Panorama stress views were classified according to Rockwood (Type II=8; IIIA=9; IIIB=24; IV=7; V=52). On Alexander views, where the affected arm is rested on the contralateral shoulder, the "circles measurement" and the semi-quantitative of dynamic horizontal translation (none: n=6; partial: n=15; complete: n=79) were assessed.

Convergent and discriminant validity of the "circles measurement" with the coracoclavicular (CC) distance and Rockwood types (including its ABC classification) as well as the semi-quantitative degree of dynamic horizontal translation were tested.

RESULTS:

The "circles measurement" showed a strong correlation with the coracoclavicular (CC) distance according to Rockwood ($r = 0.66$; $p < 0.001$) and differentiated between Rockwood types undergoing different treatment pathways according to the ABC classification, including types IIIA and IIIB. Threshold values between treatment classification groups were 18 mm (A vs. B) and 21.4 mm (B vs. C). The "circles measurement" correlated with the semi-quantitative method for assessing horizontal translation ($r = 0.61$; $p < 0.001$). Measurement values were smaller for cases without translation than for partially unstable cases (10.8 mm; 95% confidence interval (CI) 7.4-14.2 mm vs. 16.1; 95% CI 13.9-18.2 mm; $p = 0.008$). Cases with a complete horizontal translation had larger measurement values (24.3; 95% CI 23.2-25.5 mm; $p < 0.001$, respectively).

DISCUSSION AND CONCLUSION:

In this first in-vivo study, the circles measurement allows a differentiation between Rockwood types undergoing different treatment pathways according to the ABC classification in acute ACJ dislocations with a single measurement and correlates with the semi-quantitative degree of horizontal translation. By being a quick and radiation-reducing method, the "circles measurement" might represent the new gold standard in diagnosing acute ACJ dislocations.