

INTRA- AND INTER-OPERATOR RELIABILITY OF A NOVEL HAND PROTOCOL DURING GRIP MOVEMENT

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INTRODUCTION

Quantitative and qualitative measures of human movement can be two important features for discriminating healthy and pathological conditions, for expressing the outcomes and clinically changes in subjects' functional state and for helping in the decision making within clinical setting. Clinical scales are the most frequently used instruments for the upper extremity functional assessment [1]. Currently there are no methods sufficiently accurate that analyze the hand mobility in clinical practice. The purpose of the study was to evaluate the Intra-and inter- operator reliability of a novel hand protocol during grip movement.

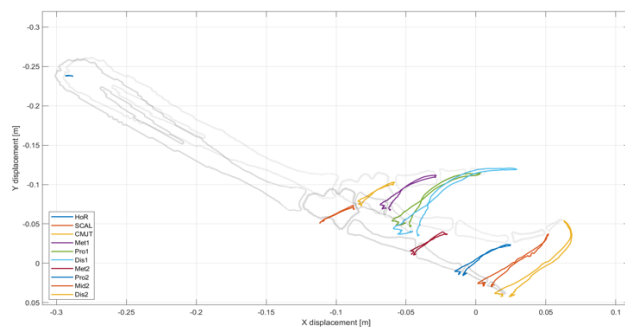
METHODS

5 healthy subjects were scheduled for analysis. The experimental protocol required the positioning of 8 optoelectronic cameras and 24 markers. Three reference markers are located on the Head of Radius, on the Styloid processes of Radius and Ulna to determinate the wrist coordinate frame and global position and orientation of the model. Then, a marker is placed on the hand dorsum, corresponding to the position of scaphoid, capitate and lunate bones to determinate the dorsum coordinate frame and the direction during the movement. A marker is placed on each hand joint (metacarpal, proximal and distal) and on the top of the finger to determine the position of the segment hand. The subjects perform a grip movement in order to grasp a cylinder at a non-imposed speed, and return to starting position (Figure. 1). Each subject received 2 markerizations by two different operators (A and B) and they carried out 3 tests at a time T0 and at a time T1 (a week after) for each markerization [2]. The following distances were considered in the analysis, between SCAL and 5 points: HR, CMJT, Met3, Dist3, Dist1.

RESULTS

Intraclass correlation coefficients were calculated to assess inter- and intra-operator reliability. Operators did not obtain significantly different values. Test-retest reliability of the markers positions measurements was good (test: 0,893, $p < 0.001$; retest: 0,773, $p < 0.01$) and intra-operator reliability was excellent (A: 0.983, $p < 0.001$; B: 0.993 $p < 0.001$).

Figure 1 Grip movement of the first 2 fingers



DISCUSSION

This system provides information on quality and amplitude of the movement. Hand movement analysis by 3D kinematics has the potential to become an important clinical evaluation method and no standardized protocol for clinical application has yet been developed [3]. A good intra- and inter-operator reliability provides a reliable protocol in order to apply it in clinical practice to study possible patterns in pathological conditions. The study is still ongoing and we expect that a larger sample size will produce a statistical significance.

REFERENCES

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