CO19-004-e
Scapulothoracic kinematics in children: Accuracy and reliability
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Modified 3D scapular kinematic patterns for two activities of daily living in painful shoulders with restricted mobility: A comparison with contralateral unaffected shoulders
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Keywords: Shoulder; Scapula; 3D analysis; Kinematics; Glenohumeral osteoarthritis; Frozen shoulder; Rotator cuff tendinopathies; Activities of daily living; Functional disability
Introduction.– There is a lack of studies of the 3D scapular kinematic patterns for patients with shoulder pathologies during self-care activities of daily living (ADL).
Objective.– This study aimed to compare 3D scapular kinematic of both shoulders (affected and contralateral non-affected) in patients with unilateral shoulder pathology as they performed two ADL: hair combing and back washing, with use of an electromagnetic device (Polhemus Fastrack).
Methods.– Forty-eight patients: 11 with glenohumeral osteoarthritis (GHOA), 20 with frozen shoulder (FS) and 17 with rotator cuff tendinopathies (RCT)
Results.– Comparing the two conditions, four of the six patients increased length of the trajectory and peak hand velocity of the reaching phase of the movement when they performed the task with a stabilized wrist. In the same way, shoulder-elbow synergies (as expressed by the relation between shoulder flexion-extension and elbow flexion-extension) were enhanced by wrist stabilization. The two other patients and the controls had the same results in both conditions.
Conclusion.– There are specific 3D scapular kinematics patterns related to the shoulder pathology. Specific scapular kinematic patterns must be considered for appropriate therapeutic management.
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A simple method to compare body and upper limb kinetics in the course of pointing task
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Effect of wrist stabilization on global upper arm kinematics
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Keywords: Upper arm; Hemiplegia; Neuro-orthopedic surgery; Spasticity; Tenotomies; Kinematic; Pointing
Introduction.– Functional surgery of the upper arm of post-stroke patients often leads to a reflexion about stabilization of the wrist by arthrodesis or tenodesis [1]. We currently know that this stabilization is efficient on joint deformation but its effect on global kinematic of the upper arm is unknown.
Material and methods.– Two controls and six chronic hemiparetic patients (mean age: 51 years; delay post-injury: 7.5 years) underwent kinematic analysis of reaching movements of the upper arm, with and without wrist stabilization by an orthosis. Pointing tasks were conducted in three different directions of the peri-personal space of participants. Kinematic features were recorded through four Polhemus sensors attached to the arm (Fastrack*).
Results.– Comparing the two conditions, four of the six patients increased length of the trajectory and peak hand velocity of the reaching phase of the movement when they performed the task with a stabilized wrist. In the same way, shoulder-elbow synergies (as expressed by the relation between shoulder flexion-extension and elbow flexion-extension) were enhanced by wrist stabilization. The two other patients and the controls had the same results in both conditions.
Discussion.– Wrist stabilization is strongly suspected to enhance proximal kinematic of the upper arm during reaching after lesion of the central nervous system, probably through simplification of the poly-articular chain of the arm. These very preliminary results have to be confirmed. It may lead to changes in our rehabilitation and surgical procedures.
Reference
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