

Discussion.— This is a preliminary study about the hemiplegic posture, limited by a lack of power. The hypothesis of the anteriorisation of COP associated with spasticity is not statistically significant but was found with two patients who were assessed twice: anteriorisation of the hemiplegic side COP in the second pass associated with the development of spasticity. This study should be completed by the inclusion of more patients to look for a correlation between these statistical parameters, medical examination and clinical evolution.

<http://dx.doi.org/10.1016/j.rehab.2012.07.298>

P056-e

Isokinetic study of the impact of styloid fracture with a volar plate osteosynthesis on pronosupination strength

M. Julia^{a,*}, O. Mares^b, C. Bosch^b, A. Dupeyron^c, I. Laffont^a

^aDépartement MPR, CHU Lapeyronie, 191, avenue du Doyen-Gaston-Giraud, 34295 Montpellier cedex 5, France

^bDépartement chirurgie orthopédique, CHU Lapeyronie, France

^cDépartement MPR, CHU Nîmes, Nîmes, France

*Corresponding author.

E-mail address: m-julia@chu-montpellier.fr.

Keywords: Fracture styloid; Force; Supination; Isokinetic

Hypothesis.— Recent studies have shown that the presence of an associated ulnar styloid fracture does not adversely affect the clinical and functional outcomes in patients with a distal radius fracture.

The purpose of this study was to evaluate a series of patients with an internally fixed fracture of the distal part of the radius to test the null hypothesis that there is no difference in isokinetic evaluation between those patients with an untreated fracture of the ulnar styloid base and those with no ulnar fracture or a tip fracture.

Methods.— Ten consecutive patients were recruited at 1 year after ORIF with a volar locking plate of the distal radius. The patients were divided in two groups: – group 1: patients with a concomitant untreated fracture of the base of ulnar styloid; – group 2: patients without fracture of the ulnar styloid or just a tip fracture. A control group (Group 3) was composed of six healthy patients without history of trauma of the wrist.

All the patients were tested bilaterally for isokinetic and isometric pronation and supination strength.

Clinical outcomes such as grip strength, range of motion, Mayo Clinic Wrist score (MWS), DASH score and Lidstrom classification were evaluated by an independent observer and correlated with isokinetic results.

Statistical analysis was performed with Kruskal-Wallis test and Wilcoxon test ($P < 0.05$).

Results.— There were no significant differences in range of motion; grip strength; MWS and DASH scores and isometric strength of pronation and supination.

Isokinetic evaluation showed a significant decrease of the supination strength between group 1 compared to group 2 and 3 at 45°/s ($P < 0.01$).

Discussion.— This study suggests that fracture of the base of the ulnar styloid has no effect on upper extremity specific questionnaires. However, a significant decrease in isokinetic supination force is expected. More specific health questionnaires may confirm the clinical effect of this loss of strength. Consequently, more aggressive treatment for the ulnar styloid may be proposed in case of fracture of the radius associated with ulna in young and active patients.

<http://dx.doi.org/10.1016/j.rehab.2012.07.299>

P057-e

The control of force is affected in a general, not just in a task-specific manner in writer's cramp

J.-P. Bleton^{a,*}, M. Teremetz^b, S. Mesure^c, M. Vidailhet^d, A. Maier^b, P. Lindberg^b

^aService de neurologie et unité neurovasculaire, département de neurologie, université Paris-Descartes, hôpital Sainte-Anne et ISM (institut des sciences du mouvement), rue Cabanis 1, 75014 Paris, France

^bCentre d'études de la sensorimotricité, CNRS UMR 8194, université Paris-Descartes, Paris, France

^cISM (institut des sciences du mouvement), UMR CNRS, Aix-Marseille, faculté des sciences du sport, France

^dNeurologie et institut du cerveau et de la moelle épinière, CRICM, UPMC/Inserm UMR_S975 CNRS UMR7225, GH Pitié-Salpêtrière, France

*Corresponding author.

E-mail address: jean-pierre.bleton@wanadoo.fr.

Keyword: Writer's cramp

Objective.— Writer's cramp is an acquired task-specific focal dystonia and involves involuntary sustained muscle contractions causing abnormal writing and hand posture. Previous studies have shown that patients with writer's cramp apply higher than normal forces during writing with the affected hand (Hermsdörfer et al., 2011). This has also been shown for the asymptomatic hand (Serrien et al., 2000). Furthermore, cortical mapping of digit representations in these patients revealed not unilateral but bilateral abnormalities (Meunier et al., 2001). We consequently hypothesized that writer's cramp affects the control of force in the hand in a non-specific fashion. Therefore the objective was to show that deficits occur in both hands and in tasks other than writing.

Methods.— We have developed a grip force task that allows for the quantification of the degree of control (i) during a non-writing task, and (ii) for the writing and the non-writing hand. The task requires visuomotor tracking of isometric power grip force in a ramp-hold-and-release paradigm. We quantified the precision and the variability of the tracking as well as two aspects of timing: force onset and release duration. Two levels of hold-force have been tested: 5N and 10% MVC. This was done in both hands and also in a bimanual force-matching paradigm. Eleven patients were compared to 17 age-matched control subjects.

Results.— In the unimanual task and compared to control subjects, patients showed increased tracking error and greater force variability in the affected as well as in the unaffected hand. This was more pronounced at lower hold-forces (5N) than at 10% MVC. Moreover, patients displayed longer release durations, again in both hands. In the bimanual force-matching condition, patients showed differences compared to the performance in control subjects.

Discussion.— These preliminary results show that patients with writer's cramp have force control deficits not just in the affected but in both hands, and that these deficits, particularly at low forces, are not task-specific, i.e. not only expressed during writing. The results are in line with the hypothesis that the control of force is affected in a general, not in a specific way in writer's cramp.

<http://dx.doi.org/10.1016/j.rehab.2012.07.300>

P058-e

Effect of formed plantar orthosis on postural control in upright stance

P. Carette^{a,*}, E. Watelain^b, G. Kemoun^a, B. Dugué^a

^aLaboratoire MOVE, 8, allée Jean-Monnet, 86000 Poitiers, France

^bLaboratoire HANDIBIO, Toulon, France

*Corresponding author.

E-mail address: p.carette@chu-poitiers.fr.

Keywords: Postural control; Plantar orthosis; Cutaneous stimulation

Introduction.— The balance control system depends on basic components concerning biomechanics, and a set of reflexes that triggers equilibrium response based, on visual, vestibular and somatosensory senses [1]. In this study we have examined whether extensive stimulation of a sensory sensor can modify postural balance?

Materials and methods.— Two groups of subjectively healthy subjects (21.6 ± 1.0 years) were randomly assigned to posturographic measurements wearing formed plantar orthosis (15 subjects) or flat (not formed but in same material) soles (15 subjects), in condition eyes opened and then eyes closed. A similar test was performed in the same conditions after 1 week wearing formed or flat orthosis.

Results.— In the condition eyes opened, we observed a significant reduction of the area of body sway, and of the medial-lateral amplitude in the group using

formed plantar orthosis (significant interaction at the level $P < 0.05$ with 2×2 Anova with repeated measurements). These modifications were not found in the eyes closed condition.

Discussion and conclusion.— The reduction of sways and of medial-lateral amplitude could stem from a continuous plantar stimulation (via cutaneous mecano-receptors) with the formed sole [2]. Nevertheless, the integration of this extra stimulation is effective only in the conditions where the visual afference is not affected.

References

- [1] Horak FB. Clinical measurement of postural control in adults. *Phys Therap* 1987;12(67):1881–5.
 [2] Kavounoudias A, Roll R, Roll JP. The plantar sole in a “dynamometric map” for human balance control. *Neuroreport* 1998;9(14):3247–52.

<http://dx.doi.org/10.1016/j.rehab.2012.07.301>

P059-e

Ankle foot orthosis improves gait in a patient with neuropathic arthropathy

M. Jaouen*, A. Delarque, J.-M. Viton, L. Bensoussan, E. Dobbels, G. Lotito
 Pôle de MPR, hôpital La Timone, CHU Timone, boulevard Jean-Moulin, 13005 Marseille, France

*Corresponding author.

E-mail address: mathias.jaouen@ap-hm.fr.

Keywords: Ankle; Foot; Orthosis; Patellar tendon bearing; orthosis; Sarmiento orthosis; Neuropathic arthropathy; Gait balance analysis

Introduction.— Sensory-motor neuropathy is a common problem in physical medicine and rehabilitation. Foot neuropathic arthropathy is one of its common complications. Patellar tendon bearing is recommended to consolidate the foot. But the interest of this discharge associated with an orthosis for the purpose of functional improvement in walking was not described.

Observation.— This is about a 41-year-old patient, with a sensory-motor neuropathy of the lower limbs, a distal bilateral foot drop, walking with two standard model ankle foot orthosis and footwear. He has recently presented a neuropathic arthropathy of the left foot then a heart failure due to purpura thrombotic thrombocytopenic. Since he has left foot pain when walking (VAS 7/10), reduced walking distance, effort dyspnea stage III, and walks with two crutches. Two ankle foot orthosis were made on molding, to compensate the foot drop, and left a semi-discharge to consolidate the neuropathic arthropathy. The quantitative analysis of walking showed an improvement in walking speed of 62.5% (from 0.51 m/s to 0.8 m/s). The quantitative analysis of balance showed an improvement of 56% with eyes opened (2.54 cm to 4.32 cm²) and 49% with eyes closed (8.41 cm to 17.27 cm²). The patient didn't use crutches to walk any more, didn't have pain or dyspnea anymore and walking is no longer limited in distance.

Discussion.— In a patient with a peripheral sensory-motor neuropathy, the association of a semi-discharge and an ankle foot orthosis has improved walking, but also the balance, and autonomy. He accepted immediately, no complication was found. However, the assessment is still too early to measure the full benefits of the orthosis and the effectiveness on the consolidation of the foot neuropathic arthropathy.

<http://dx.doi.org/10.1016/j.rehab.2012.07.302>

P060-e

Test-retest intra- and interobserver reliability of 3D scapular kinematics measurements for analytic movements and activities of daily living

A. Roren^{a,*}, F. Fayad^b, A. Roby-Brami^c, S. Poiradeau^d, M. Lefèvre-Colau^d

^a CHU Cochin, 27, rue du Faubourg-Saint-Jacques, 75014 Paris, France

^b Service de rhumatologie, hôpital Hôtel-Dieu de France, université

Saint-Joseph, France

^c Instituts des systèmes intelligents et de robotique, université Pierre-et-Marie-Curie, France

^d Service de rééducation et de réadaptation de l'appareil locomoteur et des pathologies du rachis, CHU Cochin, France

*Corresponding author.

E-mail address: alexandra.roren@cch.aphp.fr.

Keywords: Scapula; 3D analysis; Kinematics; Reliability; Electromagnetic device; Activities of daily living

Introduction.— An electromagnetic device allows non invasive and accurate 3D scapula kinematics measurements. The acromial method that we used allows dynamic continuous measurement thanks to a skin surface sensor glued to the acromion. Test-retest intra- and interobserver reliability of 3D scapular kinematics have only been partially assessed for analytical movement and never for functional tasks.

Objective.— This study aimed to assess test-retest intra and interobserver reliability of 3D scapular kinematics for arm elevation in sagittal and frontal plane and for two activities of daily living (ADL), hair combing and back washing.

Methods.— Test-retest intra and interobserver reliability of both shoulders of 15 healthy subjects were assessed at rest, at 30° and at 90° of arm elevation for arm elevation in sagittal and frontal plane and for hair combing; at rest and at 30° of arm elevation for back washing. Reliability was assessed using the intraclass correlation coefficient (ICC), the standard error of measurement (SEM), the small detectable difference (SDD) and the Bland and Altman's graphical method.

Results.— Intra-observer reliability was good to excellent for every scapular rotation for both arm elevation in isolated planes and for ADL (ICC ranged from 0.64 to 0.95). Interobserver reliability of scapular rotations was fair to excellent for arm elevation in isolated planes (ICC ranged from 0.49 to 0.92) and poor to excellent for ADL (ICC ranged from 0.35 to 0.89). Interobserver reliability of scapular protraction/retraction showed the lowest ICC. For both test-retest intra and interobserver reliability, the SEM and SDD remained low and Bland and Altman's graphical method showed the good repeatability of the method of measurement.

Conclusion.— In the hands of a single observer, dynamic measurements of the scapula kinematics is adequate for both clinical practice and research. The interobserver reliability of scapular protraction/retraction must be improved.

Further reading

Johnson GR, Stuart PR, Mitchell S. A method for the measurement of the three dimensional scapular movement. *Clin Biomech* 1993;8(5):269–73.

Meskers CG, van de Sande MA, de Groot JH. Comparison between tripod and skin-fixed recording of scapular motion. *J Biomech* 2007;40(4):941–6.

<http://dx.doi.org/10.1016/j.rehab.2012.07.303>