The relationship between flexor and extensor torque produced during concentric isokinetic movements, angular position and elbow extension angular velocity will also be analyzed.

Discussion.–This preliminary work should give indications regarding the control of voluntary movements in hemiparetic patients. The collection of quantified data will assist in the appropriate adaptation of rehabilitation protocols, taking into account patient characteristics and should also help to specify indications for different rehabilitation techniques (physical, neuro-modulating and use of botulinum toxin or other pharmacological treatments).


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Ultrasound tracking for the identification of finger flexor muscles in the hemiplegic patient for a selective injection of botulinum toxin

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Introduction.–Hemiplegia is often associated with a pattern of upper limb spasticity with adduction, internal rotation and flexion of the shoulder, pronation, flexion of the elbow, wrist and fingers flexion making it difficult to identify and to treat flexor digitorum superficialis and profundus with botulinum toxin. The progress of high-frequency ultrasound probes has for many years allowed a precise location of osteo-articular structures.

Objectives.–Our study aimed at assessing the feasibility of tracking flexor digitorum profundus and superficialis by ultrasound system in stroke patients.

Material and method.–Ten post-stroke patients with an Ashworth modified score of at least two on the main upper limb muscles and with the upper limb spontaneously placed with elbow flexion, pronation of the forearm and finger flexion were included. An ultrasound probe with a high frequency of 10 MHz was used for the ultrasonographic tracking.

Tracking sonography was performed in each patient’s healthy side, in the anatomical position and then flexion and pronation of the elbow and finger flexion. Then, each patient underwent an ultrasound tracking in the hemiplegic side of the flexor digitorum superficialis and the flexor digitorum profundus.

Results.–The first set of ultrasounds allowed us to establish key benchmarks. Thus, from an axial section enabling to identify the bipecs of the brachial artery, then the pronator teres. The flexor digitorum superficialis was viewed from humerus, ulna and radius insertion. By moving the probe down, the flexor digitorum profundus could be identified. These two muscles, as well as the accompanying noble structures can be tracked until their distal end. For patients with moderate spasticity, this technique allows a precise anatomical location of the flexor superficialis and profundus muscles. However, for patients with high spasticity this technique requires an assistant’s help.

Discussion et conclusion.–This identification technique with ultrasound system is simple and allows us to consider highly selective and safe injections of finger flexor muscles. Patients with neuro-orthopedic deformities and therefore difficult access for botulinum toxin injections could benefit from this technique.


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Goal setting and attainment pertaining to upper and lower limb function in post-stroke spasticity (PSS) patients: The Botox® Economic Spasticity Trial (BEST)

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Botox® Economic Spasticity Trial (BEST)