



POSTER

Diffusion tensor imaging in acute hemiparetic stroke patients submitted to thrombectomy—a pilot study

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Abstract

Background: Stroke is a leading cause of long-term disability in adults. Diffusion tensor imaging (DTI) parameters, fractional anisotropy (FA) and apparent diffusion coefficient (ADC) measure the integrity of white matter and cytotoxic edema, respectively. DTI quantification in subacute and chronic ischemic stroke has been shown to be related to corticospinal tract damage and to the motor outcome.

Purpose: We aimed to evaluate DTI parameters in the acute phase of ischemic stroke, and compare these parameters with matched controls.

Materials and Methods: We retrospectively evaluated 13 patients with anterior circulation stroke submitted to mechanical thrombectomy between January 2014 and December 2015. DTI evaluation was performed in the first 10 days after ictus. We measured the mean FA and ADC using regions of interest (ROIs) in the middle cerebral artery territory. The same analysis was repeated in matched control patients. Non-parametric tests were used to compare groups.

Results: We analyzed a total of 13 stroke patients and 13 control patients. In the stroke group, the median age was 55 years (range 43–80) and 61.5 were female. Mean FA value in the posterior limb of the internal capsule (PLIC) was significantly lower in the affected side when compared to the normal side in the stroke group (0.68 ± 0.11 vs 0.72 ± 0.08 ; $p=0.05$). Mean ADC was significantly lower in the lenticular nucleus in the affected side in the patients group (667.0 ± 171.0 mm²/s vs 745.2 ± 70.6 mm²/s; $p=0.013$). There were no differences in the mean FA and ADC values between the affected side of patients and the same hemisphere in controls, and between the unaffected side in patients and the controls.

Conclusions: In this exploratory study using DTI we found significantly lower mean FA in the PLIC and lower mean ADC in the lenticular nucleus on the affected side in stroke patients, when compared to the contralateral hemisphere. Further research is warranted to confirm these results and to evaluate a possible role of DTI as a prognostic tool in acute ischemic stroke.

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