

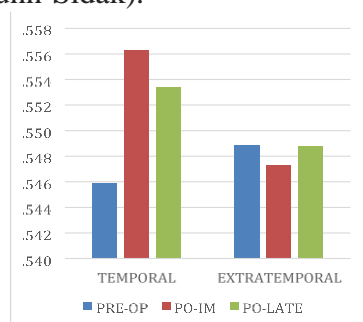
Dynamic processes after epilepsy surgery suggest partial recovery of white matter integrity

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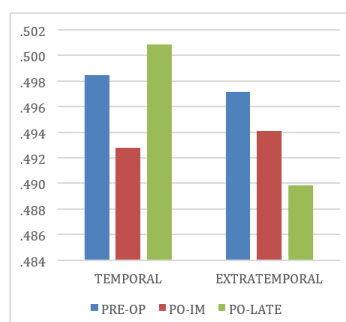
Introduction: Several studies have shown that structural and functional changes in mesial temporal lobe epilepsy extend beyond the temporal mesial region, including the contralateral hemisphere^{2,3}. We investigated how the acute and chronic postoperative alterations affected Fractional anisotropy (FA) of white matter (WM) tracts in the contralateral hemisphere of both temporal and extratemporal epilepsy.

Materials and Methods: In this study, we performed automatic tractography in three moments (preoperative, acute postoperative (first week) and long-term (at least 6 months)) for 58 temporal temporal lobe epilepsy and 46 extratemporal patients. We used ExploreDTI software (www.exploredti.com) for tractography of Diffusion Tensor Image (DTI) MRI, acquired on a PHILIPS 3T scanner. Statistical analyses with mixed models were performed with SPSS 22 software for longitudinal evaluation of FA values, including Dunn-Sidak test to adjust for multiple comparisons.

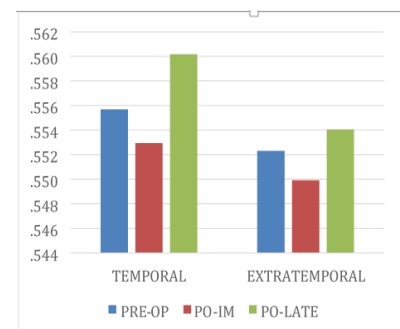
Results: Our preliminary analyses showed a general trend of increased FA in most tracts after surgery, more pronounced in the TLE group ($p < 0.05$, corrected with Dunn-Sidak). However, we identified significant FA decrease in the fornix (fig f.*) of TLE patients ($p = 0.02$, corrected with Dunn-Sidak).



a. FA Values of the body of the corpus callosum

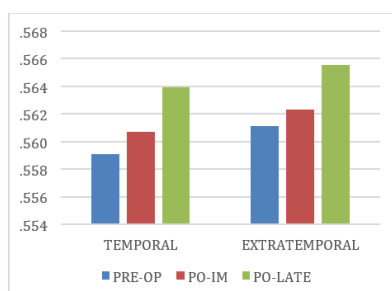


b. FA Values of the genu of corpus callosum

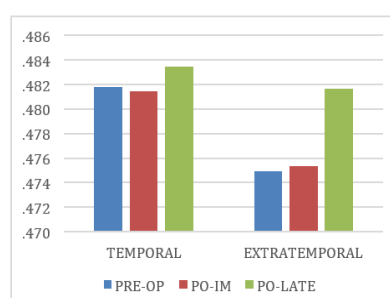


c. FA Values of the splenium of corpus callosum

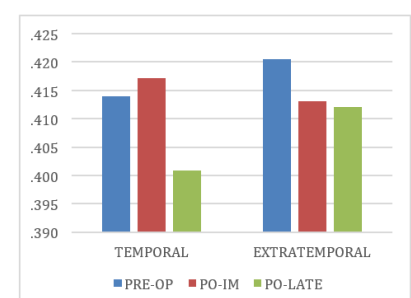
*



d. FA Values of the corticospinal tract



e. FA Values of the dorsal cingulum



f. FA Values of the fornix (*)

Discussion: The value of FA is an important tool that allows us to make inferences about the WM integrity. Although not statistically significant, our results suggest that most of the tracts present an improvement of FA after surgery regardless the local of surgery. It is probable that the progressive FA decrease in the fornix of TLE group result from hippocampal deafferentation after hippocampal removal, which may not be related to postoperative seizure outcome.

Conclusion: There is a tendency to axonal regeneration of the fibers after withdrawal of the epileptogenic focus, in both temporal and extratemporal patients;

References: [1] Yasuda, C.L., et al., *Neurology*, 2010. 74(13): p. 1062-8 (5): 1014-1018, 2010; [2] Coan, A.C., et al., *Epilepsia*, 2014. 55(8): p. 1187-96. [3] Yasuda, C.L., L.E. Betting, and F. Cendes, *Expert Rev Neurother*, 2010. 10(6): p. 975-84