

FP07

Analysis of Δ ADC (apparent diffusion coefficient linked with the cardiac cycle) in craniosynostosis

Osamu Akiyama, Kazuaki Shimoji, Takaoki Kimura, Masakazu Miyajima, Hajime Arai
Department of Neurosurgery, Juntendo University, Tokyo, Japan

Objective: The surgical indication of craniosynostosis is, in some degree, based in cosmetic reasons especially in single suture synostosis. However, there are reports that there are cases with increased intracranial pressure (ICP) in craniosynostosis even in single suture synostosis. It is still a distress to measure ICP with a less invasive method especially to evaluate the postoperative state. Recently apparent diffusion coefficient (ADC) was measured using MR imaging. We applied this ADC linked with cardiac cycle (Δ ADC) to measure the molecular movement more accurately without the effect of the brain pulsation preoperation and postoperation in craniosynostosis.

Materials and Methods: We had applied this Δ ADC before surgery and after surgery in 7 patients of craniosynostosis (4 trigoncephaly, two scaphocephaly, one plagiocephaly). The region of interest (ROI) was set to the basal ganglia. The value was calculated and compared between the two time points.

Results: In each cases the value of Δ ADC increased (mean increased value: 0.257) after surgery which means the molecular movement in the brain was increased after surgery. If we can interpret that this means the release of the raised ICP, measurement of Δ ADC can give us a chance to measure the release of the tight brain due to the inhibited growth of the skull.