Hippocampal Transection

Multiple hippocampal transection (MHT) is a surgical procedure that serves to disrupt seizure propagation fibers within the hippocampus without impairing verbal memory or the loss of stem cells. Given the paucity of literature regarding the utility and long-term outcome of MHT, Patil in 2016 reviewed the literature to support the utility of this procedure in the treatment of intractable temporal lobe epilepsy. Long-term outcome analysis of this technique has been reported by 2 independent groups. Both groups used intraoperative electrocorticography. All patients underwent multiple subpial transection on the neocortex and MHT on the hippocampus [1].

The optimal surgical treatment for intracranial cavernous malformation-related temporal lobe epilepsy (CRTLE) is still controversial because it frequently involves hippocampus as an epileptogenic zone.

Ishida et al., from the Department of Neurosurgery, Johns Hopkins Hospital and Department of Neurosurgery, Kumagaya General Hospital Japan, describe a unique surgical strategy of performing hippocampal transection (HT) plus tumor resection for CRTLE to solve the question of how to balance postoperative seizure outcomes and neuropsychological outcomes.

From 2005 to 2016, seven cases of HT plus tumor resection have been performed for the patients with CRTLE. They routinely perform intraoperative electrocorticography just before and after the resection of the tumor with hemosiderin rim. In cases with residual spikes from hippocampus after the resection, they add HT, considering laterality of the lesion, preoperative memory functions and MRI abnormalities in hippocampi. Patient information, including follow-up periods, seizure outcomes, and preoperative and postoperative (12 months postoperatively) Wechsler Memory Scale-Revised (WMS-R), has been collected.

In the mean follow-up of 62.7 months [range 20-119], the postoperative seizure outcome is as follows: Engel class I in six cases (85.7%) and II in one case (14.3%). Perioperative changes in WMS-R score were as follows: 93.5 preoperatively versus 99.5 postoperatively (P=0.408) in verbal memory and 90.7 versus 98.0 (P=0.351) in delayed recall. Overall, no patient presented with more than 25% decline in any of the WMS-R indices postoperatively.

Postoperative seizure outcomes are acceptable in this study with favorable postoperative memory outcomes. Although it did not reach the statistical significance, memory functions were rather improved postoperatively. In patients with CRTLE, additional HT is a reasonable treatment option [2].

1)
Patil AA, Chamczuk AJ, Andrews RV. Hippocampal Transections for Epilepsy. Neurosurg Clin N Am. 2016 Jan;27(1):19-25. doi: 10.1016/j.nec.2015.08.013. Epub 2015 Oct 24. Review. PubMed PMID: 26615104.
2)
Ishida W, Morino M, Matsumoto T, Casaos J, Ramhmdani S, Lo SL. Hippocampal Transection Plus Tumor Resection as a Novel Surgical Treatment for Temporal Lobe Epilepsy Associated with Cerebral Cavernous Malformations. World Neurosurg. 2018 Jul 28. pii: S1878-8750(18)31586-9. doi: 10.1016/j.wneu.2018.07.108. [Epub ahead of print] PubMed PMID: 30064030.