Operculo insular epilepsy treatment

Stereoelectroencephalography-guided three-dimensional radiofrequency thermocoagulation

Operculo insular epilepsy surgical treatment

Obaid et al. performed a systematic review and individual participant data meta-analysis to determine the efficacy and safety profile of surgery for IE and identify predictors of outcomes. Of 2,483 unique citations, 24 retrospective studies reporting on 312 participants were eligible for inclusion. The median follow-up duration was 2.58 years (range, 0-17 years), and 206 (66.7%) patients were seizure-free at the last follow-up. Younger age at surgery (≤18 years) (HR=1.70, 95% CI=1.09-2.66, p=0.022) and invasive EEG monitoring (HR=1.97, 95% CI=1.04-3.74, p=0.039) were significantly associated with shorter time to seizure recurrence. Performing MR-guided laser ablation or radiofrequency ablation instead of open resection (OR=2.05, 95% CI=1.08-3.89, p=0.028) was independently associated with suboptimal or poor seizure outcome (Engel II-IV) at the last follow-up. Postoperative neurological complications occurred in 42.5% of patients, most commonly motor deficits (29.9%). Permanent neurological complications occurred in 7.8% of surgeries, including a 5% and 1.4% rate of permanent motor deficits and dysphasia respectively. Resection of the frontal operculum was independently associated with greater odds of motor deficits (OR=2.75, 95% CI=1.46-5.15, p=0.002). Dominant-hemisphere resections were independently associated with dysphasia (OR=13.09, 95% CI=2.22-77.14, p=0.005) albeit none of the observed language deficits were permanent. Surgery for IE is associated with a good efficacy/safety profile. Most patients experience seizure freedom, and neurological deficits are predominantly transient. Pediatric patients and those requiring invasive monitoring or undergoing stereotactic ablation procedures experience lower rates of seizure freedom. Transgression of the frontal operculum should be avoided if it is not deemed part of the epileptogenic zone. Well-selected candidates undergoing dominant-hemisphere resection are more likely to exhibit transient language deficits; however, the risk of a permanent deficit is very low [1)]

Presurgical evaluation

Presurgical evaluation of patients with operculoinsular epilepsy and negative MRI presents major challenges. Wang et al., examined the yield of noninvasive modalities such as voxel-based morphometric MRI postprocessing, FDG-PET, subtraction ictal SPECT coregistered to MRI (SISCOM), and magnetoencephalography (MEG) in a cohort of patients with operculoinsular epilepsy and negative MRI.METHODSTwenty-two MRI-negative patients were included who had focal ictal onset from the operculoinsular cortex on intracranial EEG, and underwent focal resection limited to the operculoinsular cortex. MRI postprocessing was applied to presurgical T1-weighted volumetric MRI using a morphometric analysis program (MAP). Individual and combined localization yields of MAP, FDG-PET, MEG, and SISCOM were compared with the ictal onset location on intracranial EEG. Seizure outcomes were reported at 1 year and 2 years (when available) using the Engel classification.RESULTSTen patients (45.5%, 10/22) had operculoinsular abnormalities on MAP; 5 (23.8%, 5/21) had operculoinsular hypometabolism on FDG-PET; 4 (26.7%, 4/15) had operculoinsular hyperperfusion on SISCOM; and 6 (30.0%, 6/20) had an MEG cluster (3 tight, 3 loose) within the operculoinsular cortex. The highest yield of a 2-test combination was 59.1%, seen with MAP and SISCOM, followed by 54.5% with MAP and FDG-PET, and also 54.5% with MAP and MEG. The highest

yield of a 3-test combination was 68.2%, seen with MAP, MEG, and SISCOM. The yield of the 4-test combination remained at 68.2%. When all other tests were negative or nonlocalizing, unique information was provided by MAP in 5, MEG in 1, SISCOM in 2, and FDG-PET in none of the patients. One-year follow-up was available in all patients, and showed 11 Engel class IA, 4 class IB, 4 class II, and 3 class III/IV. Two-year follow-up was available in 19 patients, and showed 9 class IA, 3 class IB, 1 class ID, 3 class II, and 3 class III/IV.CONCLUSIONSThis study highlights the individual and combined values of multiple noninvasive modalities for the evaluation of nonlesional operculoinsular epilepsy. The 3-test combination of MAP, MEG, and SISCOM represented structural, interictal, and ictal localization information, and constituted the highest yield. MAP showed the highest yield of unique information when other tests were negative or nonlocalizing [2)].

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2)
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