Brno Epilepsy Center

- Visual Features in Stereo-Electroencephalography to Predict Surgical Outcome: A Multicenter Study
- The class imbalance problem in automatic localization of the epileptogenic zone for epilepsy surgery: a systematic review
- Human brain local field potential recordings during a battery of multilingual cognitive and eye-tracking tasks
- Stress, epileptiform symptoms in schizophrenia and neural information transmission
- Leveraging interictal multimodal features and graph neural networks for automated planning of epilepsy surgery
- Non-invasive therapeutic drug monitoring: LC-MS validation for lamotrigine quantification in dried blood spot and oral fluid/saliva
- Modulating limbic circuits in temporal lobe epilepsy: impacts on seizures, memory, mood and sleep
- Refuting a Temporal Correlation: Interictal Epileptic Discharges Do Not Preferentially Occur During Respiratory Events in Patients With Sleep-Related Breathing Disorder and Epilepsy

A total of 704 patients who underwent surgery at the Brno Epilepsy Center were included in a study, 71 of those were children. Patients were separated into three time periods, 1996-2000 (n = 95), 2001-2010 (n = 295) and 2011-2022 (n = 314) based on first evaluation at the center.

The average duration of epilepsy before surgery in adults remained high over the last 25 years (20.1 years from 1996-2000, 21.3 from 2001-2010, and 21.3 from 2011-2020, p = 0. 718). There has been a decrease in rate of surgeries for temporal lobe epilepsy in the most recent time period (67% - 70% - 52%, p <0.001). Correspondingly, extratemporal resections have become more frequent with significant increase in surgeries for focal cortical dysplasias (2% - 8% - 19%, p <0.001). For resections, better outcomes (ILAE scores 1a-2) have been achieved in extratemporal lesional (0% - 21% - 61%, p = 0.01, at least two years follow-up) patients. In temporal lesional patients, outcomes remained unchanged (at least 77% success rate). A longer duration of epilepsy predicted a less favorable outcome for resective procedures (p = 0.024) in patients with disease duration of less than 25 years.

The spectrum of epilepsy surgery is shifting towards non-lesional and extratemporal cases. While success rates of extratemporal resections at this center are getting better, the average duration of epilepsy before surgical intervention is still very long and is not improving. This underscores the need for stronger collaboration between epileptologists and outpatient neurologists to ensure prompt and effective treatment for patients with drug-resistant epilepsy [1)].

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16 VNS patients (median age 12.0 years, range 6.0 to 16.0 years; median seizure duration 6.5 years, range 2.0 to 15.5 years) followed for at least 10 years were graded as non-responder - NR (seizure frequency reduction < 50%), responder - R (reduction ≥ 50% and < 80%), and 80% responder - 80R (reduction ≥ 80%). Data about surgical aspects (battery replacement, system complications), seizure dynamics, and medication changes were taken from the database.

The early percentages of good results (80R + R) were 43.8% (year 1), 50.0% (year 2), and 43.8% (year 3). These percentages remained stable between years 10 and 12 (50% year 10; 46.7% year 11; 50% year 12) and increased in years 16 (60%) and 17 (75%). Depleted batteries were replaced in ten

patients, six of whom were either R or 80R. In the four NR, the indication for replacement was improved quality of life. Three patients had VNS explanted or switched off-one had repeated asystolia and two were NR. The effect of hormonal changes in menarche on seizure was not proven. During the study, antiseizure medication was changed in all patients.

The study proved the efficacy and safety of VNS in pediatric patients over an exceptionally long follow-up period. The demand for battery replacements indicates a positive treatment effect [2)].

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Vsiansky V, Brazdil M, Rektor I, Dolezalova I, Kocvarova J, Strycek O, Hemza J, Chrastina J, Brichtova E, Horak O, Muzlayova P, Hermanova M, Hendrych M, Pail M. Twenty-five years of epilepsy surgery at a Central European comprehensive epilepsy center - trends in intervention delay and outcomes. Epilepsia Open. 2023 Jun 1. doi: 10.1002/epi4.12769. Epub ahead of print. PMID: 37259787.
2)
Chrastina J, Horák O, Ryzí M, Brázdil M, Novák Z, Zeman T, Danhofer P. Single-center long-term results of vagus nerve stimulation for pediatric epilepsy: a 10-17-year follow-up study. Childs Nerv Syst. 2023 May 23. doi: 10.1007/s00381-023-05992-3. Epub ahead of print. PMID: 37219617.