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Fluorodeoxyglucose-18-PET/CT in preoperative epilepsy – our experience

Tomas Budrys, Algidas Basevicius, Rymante Gleizniene, Giedre Jurkeviciene, Ilona Kulakiene, Vincentas Veikutis and **Tomas Jurevicius**
Lithuanian University of Health Sciences Clinical Hospital, Lithuania

Aim & Introduction: Successful surgical ablation depends on accurate localization of the epileptogenic cortex. This is important both to ensure a complete resection of the epileptogenic focus and to reduce the resection volume as much as possible, limiting any potential neurocognitive deficits. To this end, patients typically undergo an intensive and extensive preoperative evaluation in combination with anatomical and functional imaging. We compared the amount of epileptogenic foci, determine most common localizations of epilepsy focal points in both functional and structural imaging methods and determined the success rate of surgery in the operated patients when the focal points of epilepsy coincided in all three imaging methods.

Methods: Fourteen patients underwent neurosurgical operation with removal of epileptogenic foci. Assessment of normality was verified by the Kolmogorov-Smirnov and Shapiro-Wilk tests. The Wilcoxon Signal Criteria were used to compare the two dependent samples whose data did not match the normal distribution. Concordance was evaluated by using Cohen's kappa (κ).

Results: Ten out of fourteen patients underwent surgery and demonstrated excellent postsurgical outcomes, with no epileptic seizures one year or more after the operation; 3/14 patients had 1-2 seizures after surgery and one patient had same or more epileptic seizures in duration of one year or more. Most common localization for epileptogenic activity in all three methods was temporal lobe (39.6-48.6%).

Conclusion: Surgical treatment may offer high hope for patients with intractable epileptic seizures. PET/CT are extremely useful imaging method to assist in the localization of epileptogenic zones. The dynamic functional information that brain PET/CT provide is highly complementary to anatomical imaging in MRI and functional information in EEG.

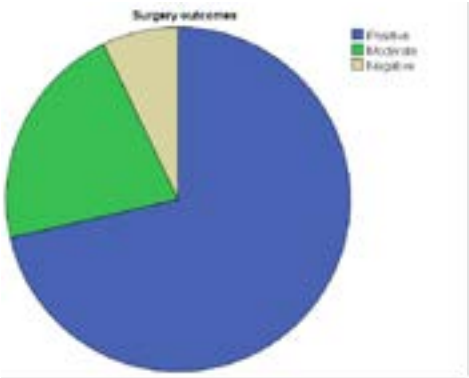

Figure 1: Fourteen patients were operated. Ten out of fourteen patients (28.6%) had excellent postsurgical outcomes, with no epileptic seizures not less than one year post operation; 3/14 patients had 1-2 seizures after surgery in 1-2 years post operation and only one patient had same amount or more epileptic seizures than before

Recent Publications

1. Fisher R S, Acevedo C, Arzimanoglou A, Bogacz A, Cross J H, Elger C E, et al. (2014) ILAE official report: A practical clinical definition of epilepsy. Epilepsia 55:475–82.
2. Murray C J, Vos T, Lozano R, Naghavi M, Flaxman A D, Michaud C, et al. (2010) Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 380(9859):2197–223.

3. Maganti R K and Rutecki P (2013) EEG and epilepsy monitoring. Continuum (Minneap Minn) 19(3):598–622.
4. Roy T and Pandit A (2011) Neuroimaging in epilepsy. Annals of Indian Academy of Neurology 14(2):78-80.
5. Cendes F (2013) Neuroimaging in investigation of patients with epilepsy. Continuum (Minneap Minn) 19(3):623–42.

Biography

Tomas Budrys is a Radiologist working in the University Hospital at the Department of Radiology specializing in Nuclear Medicine and Neuroradiology. He is specialized in Nuclear Medicine and Neuroradiology. Tomas Budrys is a last year Doctoral student working as a Lecturer for more than three years, teaching students and residents. He has published three articles with Clarivate Analytics indexing. Currently, he is developing new radiology journal and maintaining many websites associated with radiology. Tomas Budrys research interests include medical physics, neuroradiology, nuclear medicine and safety in radiology. He is also a Member of the organizations like RSNA (Radiological Society of North America), ESR (European Society of Radiology) and LRA (Lithuanian Radiology Association).

tomas.budrys@yahoo.com

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