Structure and Function of a Tertiary-level Epilepsy Center

Kyriakos Garganis, MD, Neurologist - Epileptologist

Epilepsy – Key Issues

- Prevalence: 6-7/1000
- Incidence (new cases per year): ~50/100.000
- 20% of patients assigned a diagnosis of epilepsy may in fact suffer from another disease, mimicking epilepsy
- 20% of patients with an established diagnosis of epilepsy suffer from “drug-resistant” forms of the disease – and many of them may be suitable for brain surgery, eliminating seizures, improving quality of life, prolonging patient’s life and reducing future costs

The Role of an Epilepsy Center

- Deal with the most difficult cases
- Document the diagnosis of Epilepsy, determine epilepsy type and prognosis, suggest appropriate treatments
- Identify patients with “Non-Epileptic Events”, being erroneously diagnosed and treated as epileptic
- Identify and select drug-resistant patients suitable for surgical treatment of the disease
- Perform therapeutic operations following appropriate presurgical evaluations
- Cooperate efficiently with and provide further support to referring physicians

Requirements for an Epilepsy Center

- A multi-disciplinary team of well-trained, experienced and qualified physicians, health-professionals and technicians
- Appropriate Hospital Environment and State-of-the-art technology for investigations and surgical procedures
- Clinically-oriented research contributing in further refinements of patient's work-up and optimizing outcomes, is welcome

The Multidisciplinary Team

Garganis K, MD, PhD, Neurology-Epileptology

Zountsas B, MD, PhD, Neurosurgery

Kokkinos V, PhD, Neurophysiology–Functional Neuroimaging

Maletic J, MD, Neurology

Gerothansis D, MD, PhD, Psychiatry

Pentaraki A, PhD, Neuropsychology

The MRI Unit, "St. Luke's" Hospital

Nursing & Technical Staff, "St. Luke's" Hospital

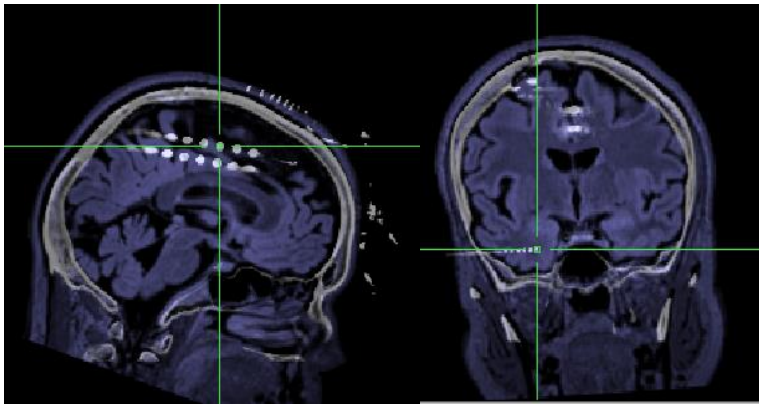
State-of-the-art-Technology

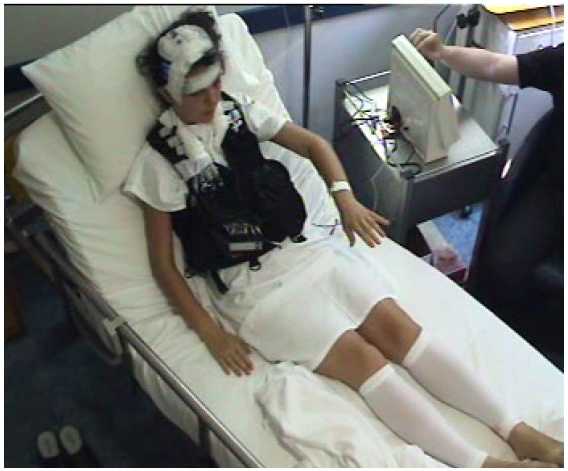
- Continuous Video-EEG Monitoring (3-bed unit) – regularly performing Extracranial and Intracranial EEG studies for Epilepsy Focus Localization




State-of-the-art-Technology

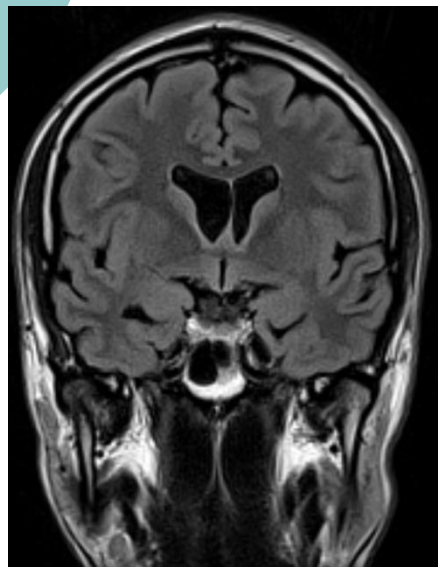
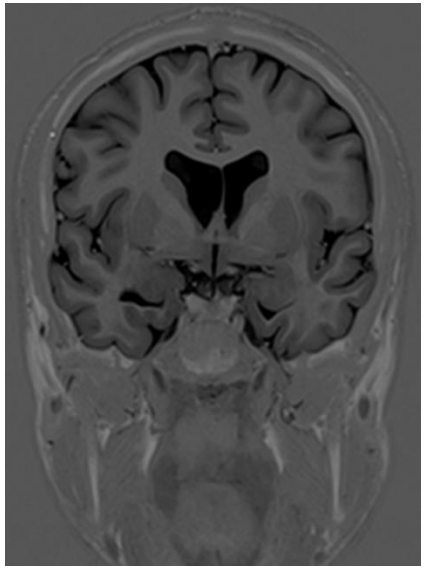
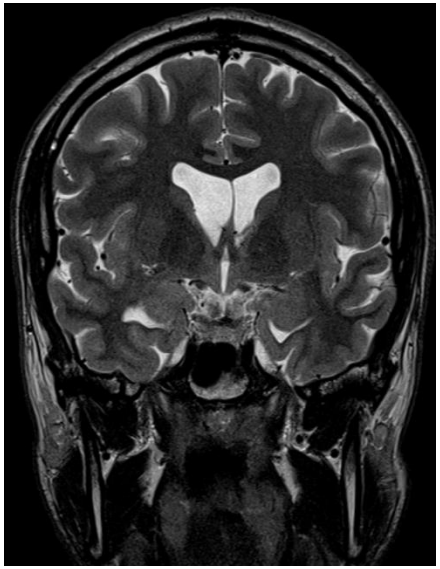
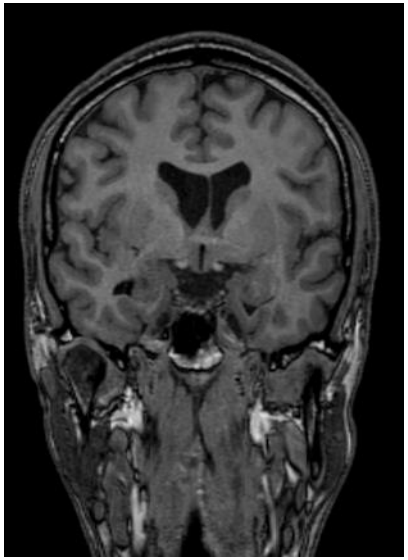
- Electrical Cortical Stimulation –
  for fine mapping of cortical regions crucial for language and somatomotor function to be spared during surgery





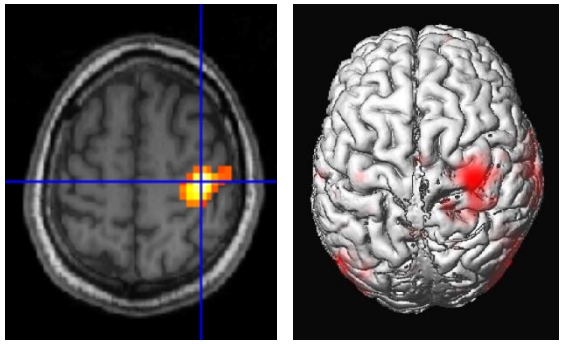
State-of-the-art-Technology

- Structural Brain MRI –
  to identify brain lesions responsible for seizures

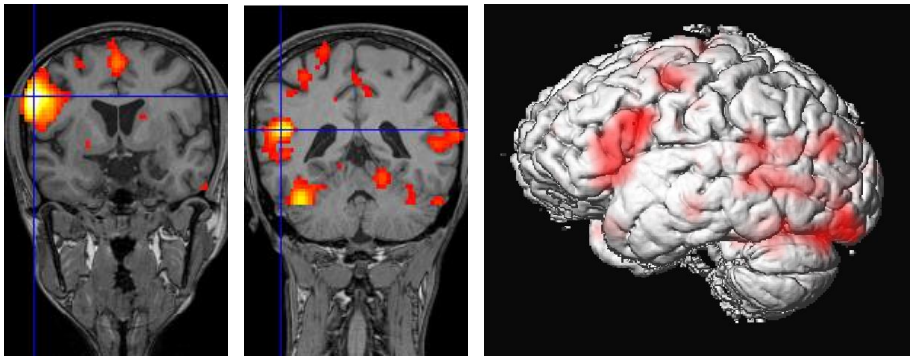





State-of-the-art-Technology

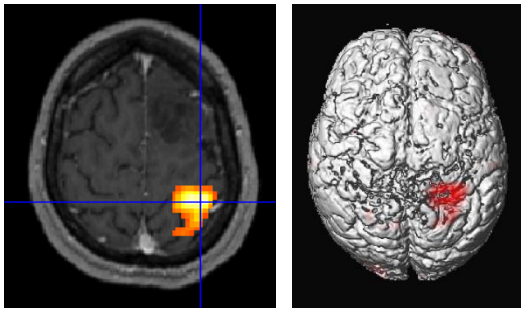
- Functional Brain MRI and EEG-FMRI -
  a) to identify brain regions supporting language/motion and memory and…



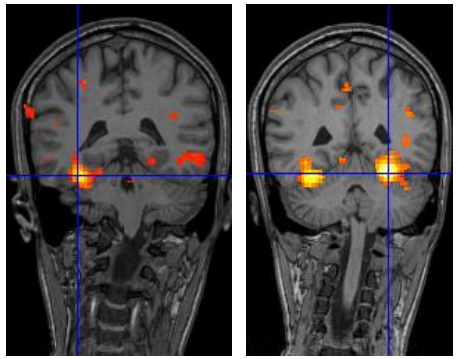
Hand Motor Task



Speech-related Task



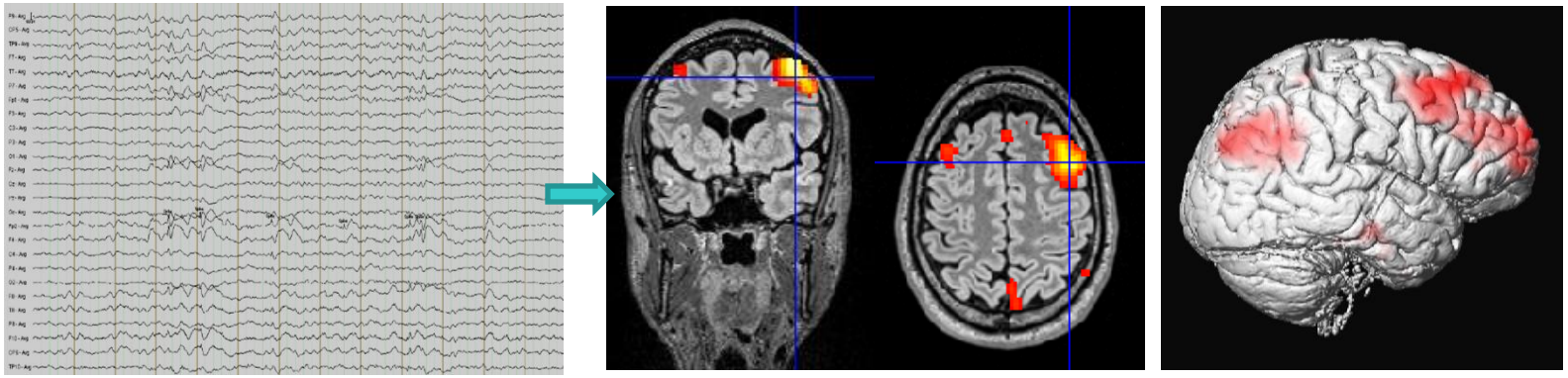
Hand Sensory Task



Memory Task

State-of-the-art-Technology

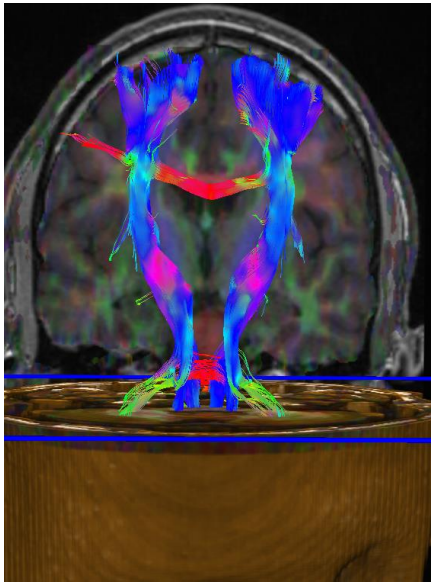
- Functional Brain MRI and EEG-FMRI -
  b) to identify brain regions involved in epileptogenic networks



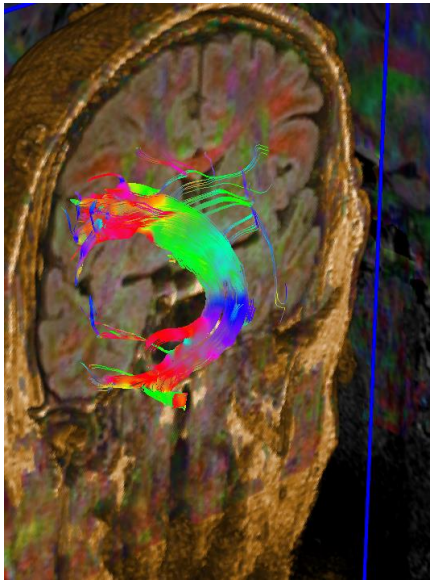
Interictal epileptic activity related activation

State-of-the-art-Technology

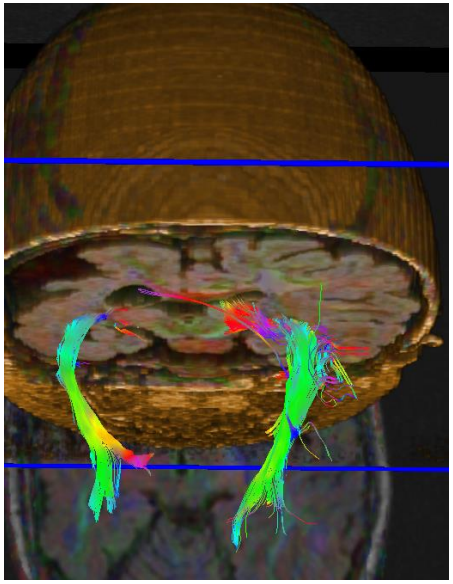
- DTI tractography and Neuronavigation -
  to identify tracts involved in speech, motion, and sensory processes to be spared during surgery



Motor Tracts



Speech Tract



Vision Tracts

Research Activity

Original article

Epileptic Disord 2012; 14 (3): 275-89

Extratemporal surface EEG features do not preclude successful surgical outcomes in drug-resistant epilepsy patients with unitemporal MRI lesions

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Received September 11, 2011; Accepted May 29, 2012

ABSTRACT – Of 47 patients with onset of intractable partial seizures and temporal lobe MRI lesions, subjected to presurgical evaluation and temporal lobe surgery, we identified eight (mean age: 24 years; range: 7-52 years) demonstrating surface interictal and/or ictal EEG features suggestive of an extratemporal localisation. All eight patients underwent surgery aiming to predominantly resect the lesion, without extending to the extratemporal region. The patients were prospectively followed (mean follow-up duration: 38 months; range: 12-66 months) and all achieved excellent postoperative seizure control. Extratemporal surface interictal/ictal EEG features were more often encountered in tumoural and focal cortical dysplasia cases, compared with medial temporal sclerosis cases, and were most frequently localised over frontopolar and suprasylvian-pericentral locations. We postulate that propagation of interictal/ictal activity from the epileptogenic region of the temporal lobe to extratemporal neocortical areas, perhaps utilising the temporal pole and insula as intermediary nodes of a common epileptogenic network, accounts for the presence of our cohort's discordant lesion and EEG features.

Brain Topogr
DOI 10.1007/s10548-011-0214-x

BRIEF COMMUNICATION

Epileptogenic Networks in Two Patients with Hypothalamic Hamartoma

Vasileios Kokkinos · Basilios Zountsas · Konstantinos Kontogiannis · Kyriakos Garganis

Epilepsy & Behavior Case Reports 1 (2013) 29–31

Contents lists available at SciVerse ScienceDirect

Epilepsy & Behavior Case Reports

journal homepage: www.elsevier.com/locate/ebcr

Case Report

Surgical outcome in neocortical resections of type IIId focal cortical dysplasia with accompanying medial temporal pathology ☆

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Research Activity

Clinical commentary

Epileptic Disord 2011; 13 (4): 422-9

Limited resection of focal cortical dysplasia and associated epileptogenic cortex may lead to positive surgical outcome

Kyriakos Garganis [1], Vasileios Kokkinos [1], Basilios Zountsas [2]
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Received August 20, 2010; Accepted November 24, 2011

ABSTRACT – A drug-resistant epilepsy patient with premotor type IIb focal cortical dysplasia is described with a positive postoperative outcome following partial resection of the lesion and epileptogenic zone. Presurgical fMRI of the sensorimotor areas showed haemodynamic responses over the posterior border of the lesion and ictal EEG-fMRI revealed activation of both the primary sensorimotor strip and premotor lesion area. Almost continuous 1-2 Hz interictal spiking was recorded during a chronic ECoG study over the primary sensorimotor cortex. Following partial resection of the lesion, an acute ECoG revealed marked reduction of epileptic activity over the sensorimotor area. Post-operatively, seizure control was significantly improved (class IV ILAE outcome). Although partial FCD resections predict a worse postoperative outcome, individual patients may still respond favourably. The type of lesion, resected portion, and histopathology may be included among factors related to successful outcome.

Pediatric Neurosurgery

Case Report

Pediatr Neurosurg
DOI: 10.1159/000330546

Received:
Accepted
Published

Hemispherotomy or Lobectomy? The Role of Presurgical Neuroimaging in a Young Case of a Large Porencephalic Cyst with Intractable Epilepsy

Vasileios Kokkinos[a] Kyriakos Garganis[a] Konstantinos Kontogiannis[b] Basilios Zountsas[b]

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Epilepsy & Behavior Case Reports 1 (2013) 157–160

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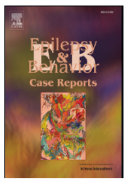

Case Report

EEG–fMRI findings in late seizure recurrence following temporal lobectomy: A possible contribution of area tempestas☆

Kyriakos Garganis *, Vasileios Kokkinos, Basilios Zountsas

Epilepsy Center of Thessaloniki, "St. Luke's" Hospital, Panorama, Thessaloniki, Greece

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Epilepsy Center, “St. Luke’s” Hospital
Current Census

- Referral Basis: Northern & Central Greece, Crete Island, Albania, FYROM
- ~ 120 cases evaluated per year; on average 2-4 days needed for evaluation
- ~ 30/120 presurgical
- ~ 15/30 operated – on
- ~ 85% of operated cases enjoy excellent postoperative seizure control – comparable to results obtained in established epilepsy centers in EU and USA

Epilepsy Center, “St. Luke’s” Hospital
Target Groups

- “Difficult-to-control” patients
- Diagnostic Uncertainties – possibility of a false diagnosis
- Drug-resistant patients – consideration of surgical treatment

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Kyriakos Garganis, MD, Neurologist - Epileptologist

THANK YOU FOR YOUR ATTENTION