

Almost 30% of the patients with focal epilepsy are refractory to pharmacological therapy and thus might be candidates for selective epilepsy surgery. Epilepsy surgery program for patients affected by focal epilepsy requires however the presence of one defined epileptogenic zone (EZ), clearly identified by the concordance of the electroclinical and imaging data. When these two data are discordant in the precise identification of the EZ the patient is admitted to invasive pre surgical evaluation by Stereo-EEG or electrocortical long lasting monitoring. Since the advent of the high resolution imaging techniques (MRI), in number of patients previously defined as “cryptogenic”, it has been possible to detect a defined brain lesion that in most of the cases coincide with the electroclinical defined EZ. As a result, patients with medically intractable epilepsy are increasingly referred for epilepsy surgery to achieve seizure control. During the last decade epilepsy surgery has been demonstrate to be a safe procedure and in a randomized controlled trial Wiebe et al. (2001) demonstrated superior rates of seizure freedom among patients undergoing temporal lobectomy compared to patients who continued medical treatment for intractable temporal lobe epilepsy (TLE), with also improvements in quality of life. Although the TLE is one of the most frequent form of epilepsy and those caused by hippocampal sclerosis represent the majority in surgical series, other lesions frequently outside the temporal lobe, such as Cortical Dysplasia, low grade or dysembriogenic tumours, might be highly epileptogenic and suitable for surgical treatment. Although the technological improvement of imaging techniques by implementing the sequences and increasing the strength of the magnet greatly ameliorated the quality of images and refined the diagnostic capability, a proportion of patients with focal epilepsy remain MRI negative thus obliged to undergo a risky invasive pre surgical evaluation. Thus in the next future a further refinement of imaging techniques are required in order to more precisely defined the presence of subtle epileptogenic lesions not only by increasing the strength of the magnetic field in clinical practice but also improving the morphological and functional images obtained by the magnetic resonance and to implement the post processing procedures to detect brain epileptogenic abnormalities that might be safely excisable bypassing the invasive pre surgical evaluation. In the present talk we report our experience in analyzing specimens from epileptic surgically treated patients by a 7T Bruker magnet and comparing the high resolution MRI slices with the correspondent sections processed for neuropathology.