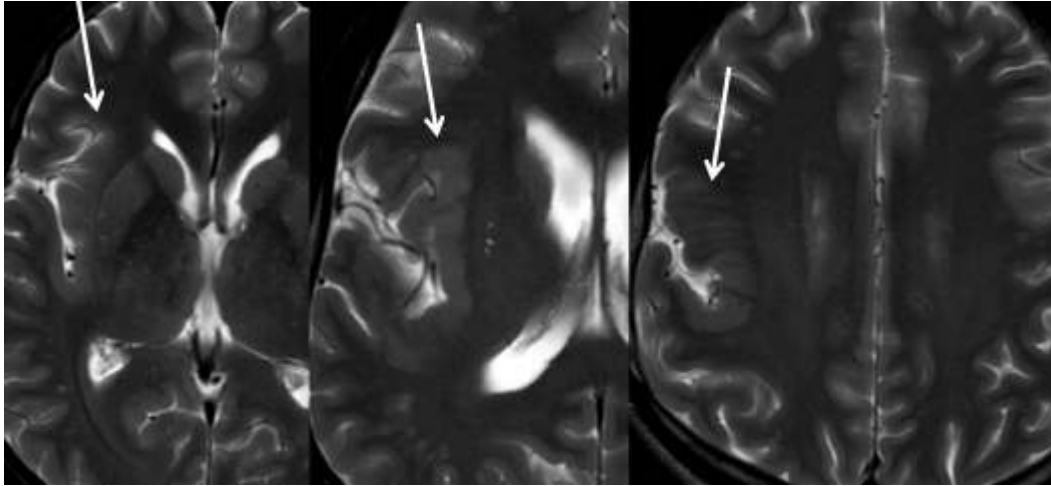




## Functional MRI By Dr. Shilpa Sankhe



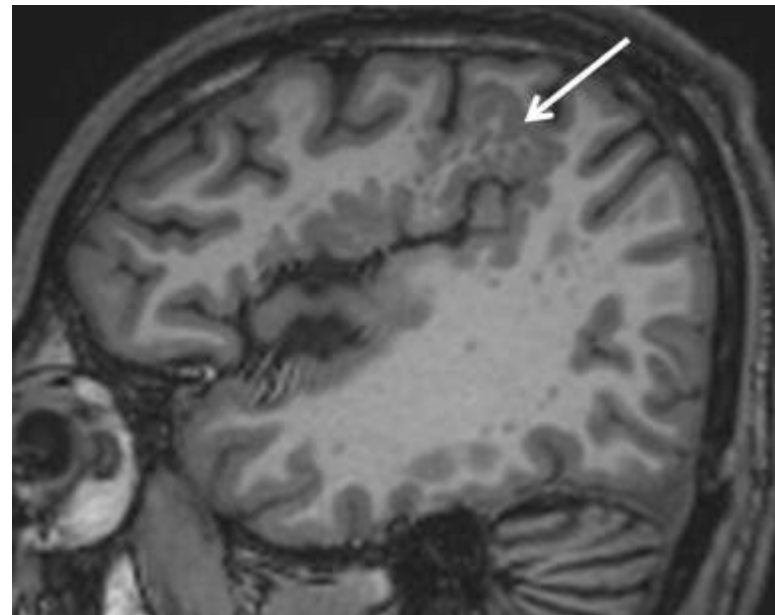
*Fig. 1: Axial T2W images show right perisylvian polymicrogyria (arrows)*

### Functional MRI

MRI is one of the vital tools for detecting anatomical and structural anomalies of the brain in patients with epilepsy. In this subset of patients, prior to surgery, high-resolution 3T MR imaging plays a critical role in detecting the epileptogenic focus and for pre-surgical mapping of the lesion in relation to the eloquent cortex.

Malformations of cortical development such as focal cortical dysplasia,

polymicrogyria and heterotopia have a high incidence of cortical reorganisation. Functional MRI in such patients is mandatory to prevent post operative deficit. fMRI is an ideal non invasive technique for localizing the eloquent cortex prior to surgery. This diagnostic information permits function-preserving and safe treatment.

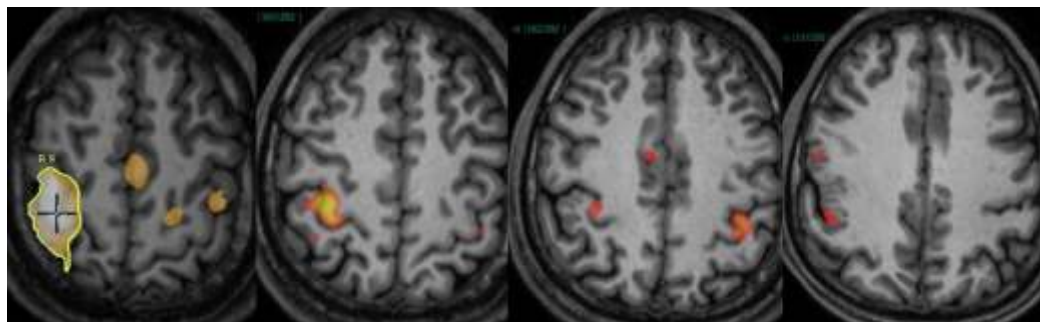


*Fig. 2: Volumetric sagittal image confirms polymicrogyria*

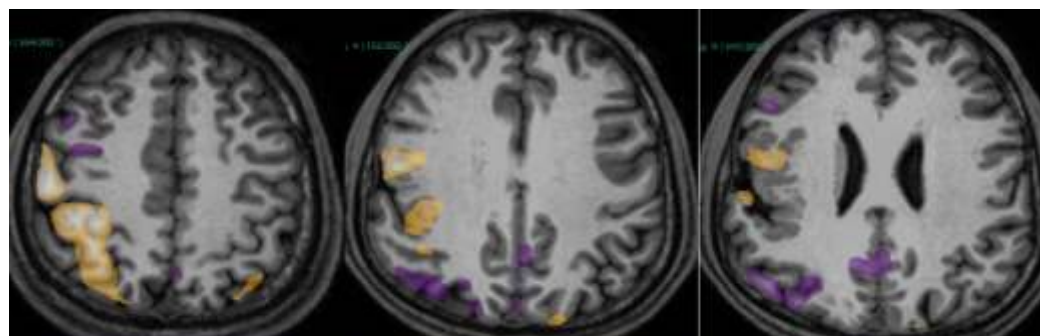
Here is a young male aged 18 years, who presented with long standing epilepsy. MRI with functional study was performed. It showed that both foot and finger functions were

*At a glance*

- Epilepsy can be due to focal cortical abnormalities
- These focal abnormalities can be treated by surgery
- Prior to surgery, functional MRI (fMRI) is needed to map out the motor areas to decide if there will be a deficit or not



*Fig. 3: fMRI study with left finger tapping reveals activation in the hand knob area as well as in the posterior margins of the polymicrogyric cortex.*



*Fig. 4: Foot activation is seen to lie completely within the polymicrogyric cortex without any activation in the paracentral lobule or SMA.*

within the area that would have to be operated. As a result, surgery was deferred and the patient was managed on medication as excision would have caused irreversible loss of motor functions.

To conclude fMRI is a robust tool for preoperative evaluation of epilepsy surgery candidates especially in cases of dysplasia where functional reorganisation is unpredictable.

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Bhaveshwar Vihar, 383, S.V.P. Road, Prarthana Samaj, Charni Road, Mumbai 400 004.