

# Epilepsy and malformations of cortical development: Editorial

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Abnormalities of cortical development represent an etiological factor in 3% of the epilepsies. However, when we analyze series of resistant to drug treatment cases, the incidence of this etiological factor increases up to 20%, because some malformations of cortical development (MCD) are particularly epileptogenic. Onset of epilepsy occurs mostly, but not exclusively, in childhood, often with severe forms that tend to resist to drug treatment and can affect cognitive development. Seizures are not the only symptom; patients may also present with neurologic, motor and cognitive deficits.

Various etiologies may be related to MCD, such as chromosome anomalies, genetic disorders, clastic damage, infectious diseases and probably toxic-environmental factors. They can involve the entire encephalon or a significant part of it, or they can be limited to only one hemisphere or to a restricted cortical area. Many groups have studied the ictal and interictal manifestations and EEG patterns of MCD, to identify possible prognostic criteria and to allow early recognition of potential drug resistance. Surgical treatment, with resective or disconnection techniques, can often achieve favorable results, rendering early identification of surgical candidates a clinically important issue.

The *Lega Italiana Contro l'Epilessia* (LICE), that has long been interested in the surgical treatment of the epilepsies thanks to the constant and pioneering

activity of Claudio Munari, organized, in Rome the 15<sup>th</sup>-16<sup>th</sup> March 2002, the Conference on Epilepsy and Malformations of Cortical Development. The II Workshop in memory of Claudio Munari, organized in conjunction, treated issues related to « Focal Cortical Dysplasia ». These two meetings organized by the LICE, with the scientific support of the Italian Neurosurgical Society, offered a comprehensive review of available knowledge on MCD. Debates involved pathologists, histologists, basic scientists, neurologists, neuroradiologists and neurosurgeons. The present publication in *Epileptic Disorders* contains most of the papers presented and aims to increase awareness of physicians regarding the possibilities offered by epilepsy surgery.

Faithful to the spirit of Claudio Munari, the sections dedicated to neurosurgical techniques are rather limited; more importance was given to etiology of malformations, pathogenesis of epilepsy, neuroimaging and pre-surgical evaluation. The papers on series of patients operated on, discussing correlations of neuroimaging and neurophysiological aspects on the basis of neuropathological data, are of particular interest. The supplement opens with a comprehensive review, by Guerrini *et al.*, of the nosography of the MCD associated with epilepsy. Follows, a series of papers on the neurophysiological and anatomic mechanisms underlying the development of

MCD: the manuscript by Bentivoglio *et al.* illustrates new aspects of the physiological development of the cerebral cortex and pathogenesis of malformations. Sarnat and Flores-Sarnat complete the nosographic overview by shedding new light on genetic-morphologic integration. Avoli *et al.* report on the neurophysiological features of cortical dysplasia, while Battaglia *et al.* contribute new ideas, from experimental models, on the genesis of the epileptogenicity of cerebral heterotopia.

A number of other papers precisely define certain clinical-morphological elements of MCD. The manuscript of D'Incerti, including an abundant iconography of MCD, and the paper by Colombo *et al.*, including examples of Focal Cortical Dysplasia (FCD) neuroimaging, offer a broad view of the morphology of abnormalities of cortical development. H. Cross adds stimulating data on functional neuroimaging and Bernasconi opens novel horizons for the detection of FCD. Tinuper's group define the clinical and neuroimaging aspects of an adult population of patients with epilepsy, reminding that epilepsy due to MCD does not exclusively occur in childhood.

Three manuscripts discuss pre-surgical assessment. Noachtar describes subdural electrode techniques. Chassoux and Francione report their experience of stereo-electroencephalography, respectively at Sainte-Anne hospital in Paris and at the Centro « Claudio Munari », Niguarda hospital in Milan. The last two papers deal with neurosurgical issues: the first, by Lo Russo *et al.*, presents focal cortical resection techniques in MCD, the second, by Villemure *et al.*, addresses hemispheric disconnection techniques.

Participation in the Conference and Workshop was both stimulating, because it offered an excellent review of the latest developments in the field, and a pleasure. The active and continuous presence of all the participants during the three days was an opportunity for a scientific and human cultural exchange that will reinforce existing collaborations and stimulate exchange of opinions, in an effort to further understand the mechanisms, clinical expressions and therapeutic challenges of these particularly epileptogenic malformations. □