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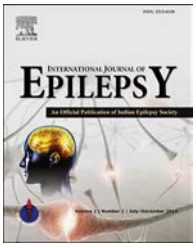

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Less invasive disconnection surgery using advanced image guidance for wide spread cortical malformations

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Purpose: Cortical dysplasia (CD) is the important pathogenesis in the pediatric intractable epilepsy. The surgical treatment is extremely effective if the epileptogenic zone is adequately detected and resected. The extent of CD is, however, usually obscure even with careful MR imaging. In widespread or multilober CD, localization of epileptogenic zone is more difficult because of multifocal and synchronous electrophysiological abnormalities. In those cases, the eloquent cerebral tissue is involved frequently inside the CD tissue in mosaic pattern, and it should be preserved intact in the surgical intervention. For better seizure control and less invasive surgery, we have introduced subcortical disconnection with techniques including intraoperative ECoG, and advanced image-guidance.

Method: Thirty-nine CD patients with intractable epilepsy were operated. Numbers of involved cerebral lobes were; one in 6 cases, two in 9 cases, three in 6 cases and hemispheric in 18 cases. Among them, 15 cases were diagnosed as symptomatic West syndrome.

Results: The surgical procedures were; focus resection in 12 cases, multilober disconnection in 12 cases and functional hemispherotomy in 15 cases, respectively. Engel Class I (no disabling seizure after the surgery) was attained in 33 cases and rare seizures in 3 cases. No serious permanent complication was experienced. Considerable amelioration in development was observed in 28 patients.

Conclusion: Less invasive disconnection surgery using advanced image guidance was successful for wide spread cortical malformations The intervention at earlier age would be recommended for better seizure control and psychomotor development.

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Vagus nerve stimulation – Mechanism of action and usefulness of its combination with corpus callosotomy for palliation of refractory epilepsy

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Vagus nerve stimulation (VNS) is indicated as an adjunctive therapy for refractory epilepsy patients who are not suitable for resective surgery (adults: grade A; children: grade C recommendation). It is effective to various seizure types regardless of their pathology both acutely and chronically. Early studies revealed a mean seizure frequency reduction of 24–31% over 3 months of follow-up. And its effects are enhanced over time (median seizure reduction of 45% at one year, with 20% of patients achieving a greater than 75% reduction).

Its mechanism of action (MOA) is not established yet. Theories include direct activation, neurotransmitter and neuropeptide modulation influencing ictal discharge, preictal changes and arousal. VNS is thought to have an effect on EEG synchronization which may prevent establishing epileptic discharge in the neural circuits and act as the acute effect. In VNS effective patients, PET scanning showed increased blood flow in the thalamus, hypothalamus, and the insular cortex with decreased blood flow in the amygdala, hippocampus, and posterior cingulate. Animal studies have looked into various possible mechanisms. In a maximal electroshock rat epilepsy model, VNS therapy was no longer effective when noradrenergic pathways were depleted by lesioning of the

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