

**Complementary**

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Multiple Subpial Transection (MST) Technique in the Treatment of Epilepsy

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Since not only the generation of epileptiform activities in the brain would cause problem in focal epilepsy but also spreading of such activities in the brain makes focal epilepsy more problematic, the most successful surgery for epilepsy is directed at resective techniques to remove the seizure generator. Multiple Subpial Transection (MST) as a nonresective technique has been developed to surgically interrupt of the seizure processes in some areas of the brain where employing the resective techniques would result in some possible undesirable complications. In this technique the surgeon would make some transections into the brain which result in interruption of fiber connections in some neighboring parts of the brain. Landau-Kleffner Syndrome (LKS), Epilepsia Partialis Continua (EPC) and Rasmussen's Encephalitis are the examples of pathologies which can be treated by using MST technique. MST as a novel technique to treat some forms of epilepsy was described by Frank Morrell. Selective destruction of some horizontal fiber connections which results in prevention of spreading of abnormal discharges makes the foundation of MST technique. MST technique is based on some facts: 1. The organization of the functional cortex is a columnar one – vertical fibers and neuronal elements – 2. Spreading abnormal discharges in seizures is done mainly by lateral radiation through interneuronal connections 3. Parallel trajectory of axonal fibers with cortical blood flow would preserve the integrity of brain vascular supply by employing MST technique 4. More than 5 mm width of cortical areas or tangential connections is necessary to generate paroxysmal neuronal discharges. The main indication for using MST technique as an stand-alone or combined procedure with cortical resection or lesionectomy, is for focal seizures which are located in eloquent cortex. Its stand-alone therapeutic use has been described by Schramm et al., Smith, Lui et al. and Whisler et al. [1-7]. There are some reports which conclude that MST can be an effective method to control seizures arising from eloquent areas of the brain. Landau-Kleffner Syndrome (LKS) which consists of acquired epileptic aphasia or verbal auditory agnosia in children

with normal developmental history, is another indication for using MST technique. Initial MST technique application in LKS is done by Morrell et al. Communication skills, behavior and speech improvements can be the results of using MST technique in LKS.

Malignant Rolandic-Sylvian Epilepsy Syndrome as a nonlesional syndrome can also be treated by using MST technique throughout the eloquent cortex and Resective surgery in nonfunctional cortex. Such combination of the techniques – MST with Resective surgery - can result in better improvements. Epilepsia Partialis Continua (EPC), Cortical Dysplasia and Rasmussen's Encephalitis are other pathologies which MST technique can be used to treat them. It is important to precisely define the seizure focus before using MST technique. Scalp EEG, VEEG, MRI, ictal-SPECT, fMRI, FDG-PET, IAP and MEG can be used for this purpose. Morrell and Whisler initially described and developed the original technique of MST [7-14]. MST surgical technique is not unique among surgeons and they perform it with some variations so the results can be different depending on the surgeon's technique. Usually using MST technique is associated with low morbidity but transient postoperative neurological deficits are common. Using MST technique as a stand-alone procedure or in combination with Resective surgery can be an effective method to treat certain epileptic pathologies.

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Conflict of Interest

No conflict of interest.

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