

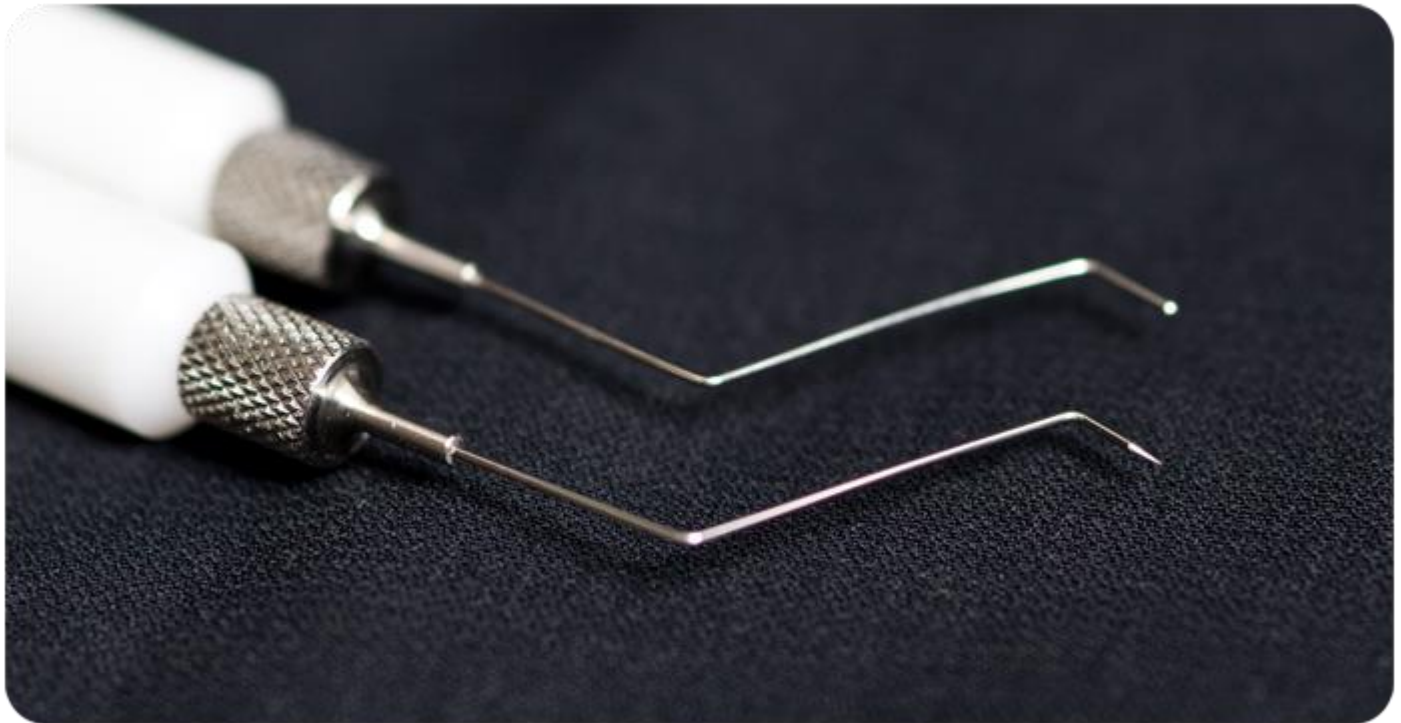
Multiple Subpial Transections (MST)

Last updated: September 5, 2017

- indicated if epileptogenic zone involves eloquent cortex
- special indication - **Landau-Kleffner syndrome**.
- seizure propagation occurs along long axis of gyri.
- nonresective surgical technique - *horizontal association fibers* (important for intracortical seizure propagation) are interrupted at 5-mm intervals; *vertically oriented projection fibers* (important for function) and pial nutrient vessels remain intact - ideal for treating epileptogenesis while preserving intrinsic cortical function!
- permanently disrupts side-to-side intracortical synchronizing neural networks and excitatory interneuronal conduction.
- because neocortex is organized in functional columnar units, cuts perpendicular to pial surface do not disrupt cortex-subcortical input-output interactions.

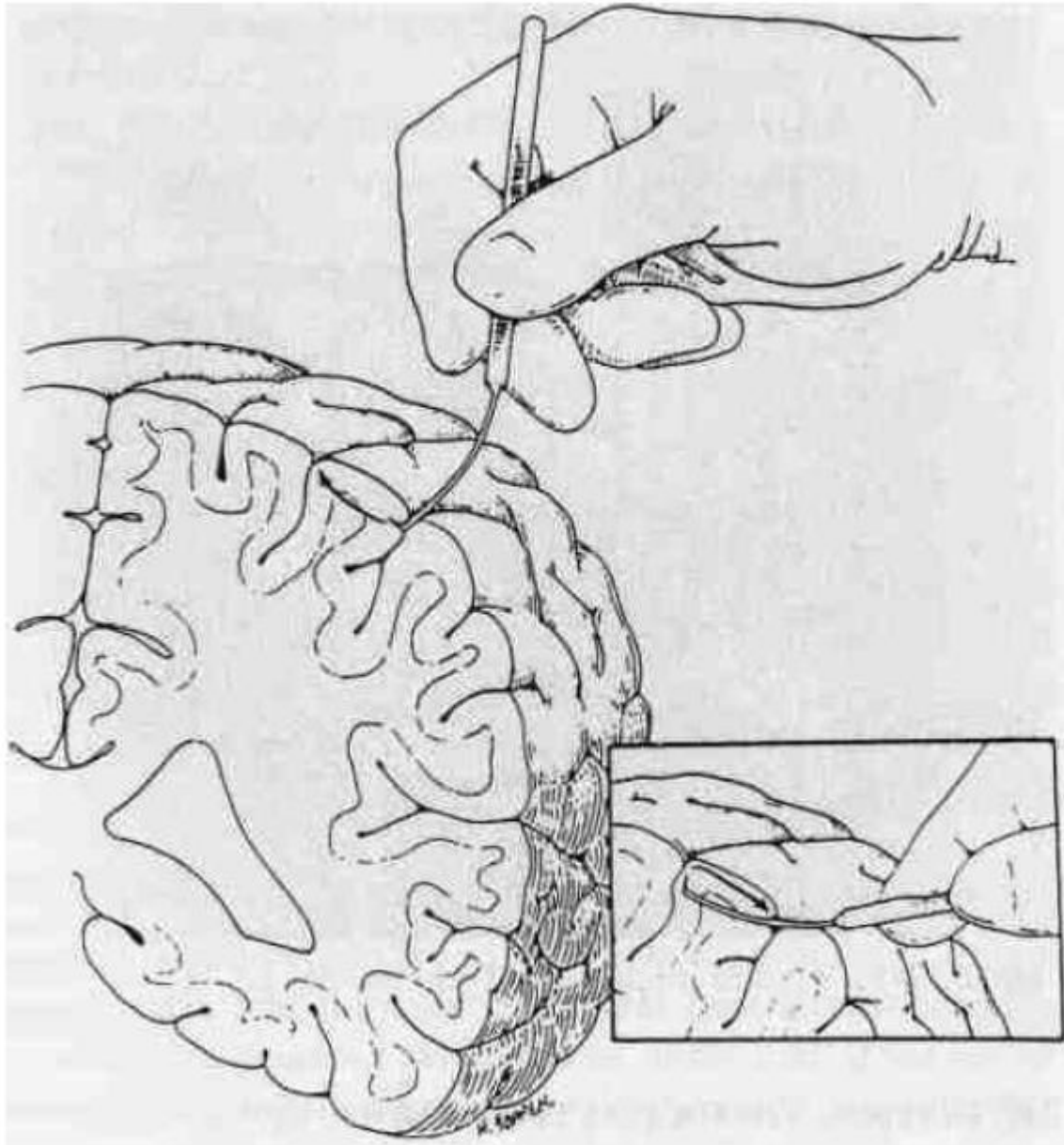
PROCEDURE

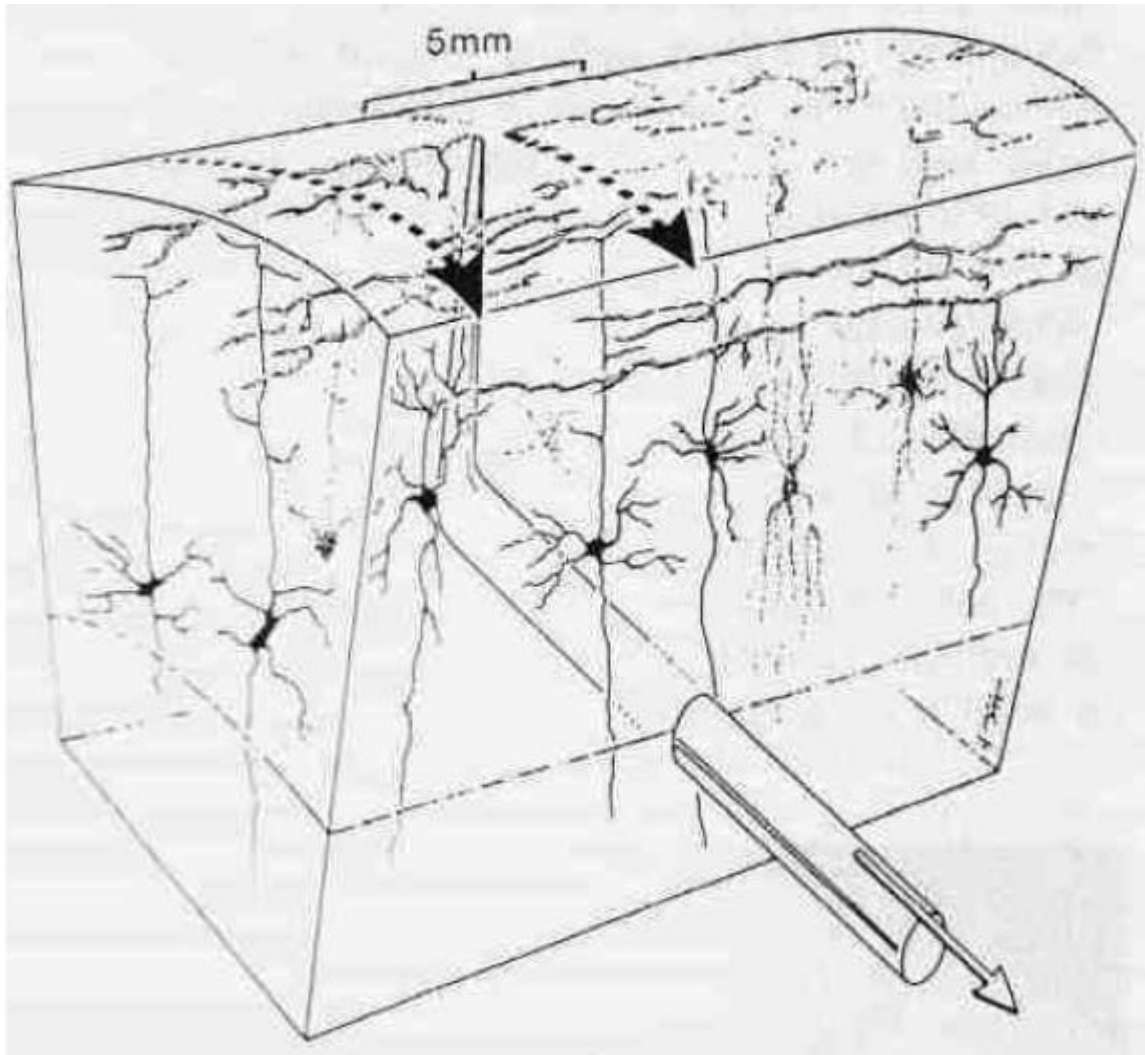
- as with all surgery for partial epilepsy, margins of epileptic focus must be defined clearly (using *subdural grid electrode*).
- most cases involve *junction of central sulcus with Sylvian fissure*.
- entire region of ictal onset should undergo MST + 1-2 cm bordering ictal zone.
- **specialty designed MST knife** (AD-TECH, Racine, Wis) with point angled downwards rather than upwards as originally described.



- cutting portion of knife is sharpened to blade - to minimize excessive damage from using blunt instruments such as right-angled dissector.
- actual cuts should be performed *under direct vision through operating microscope*.
- after protecting surrounding cortex with cotton patties, insertion point can be either at side or at crest of gyrus.

- after small pial spot is cauterized, knife blade is inserted and pushed subpially towards gyrus edge, making right-angled cut to long-axis of gyrus.
- horizontal arm to blade should be barely visible through pia at all times. If insertion point is centered in gyrus, then, after first half-cut, instrument is removed and replaced and remainder of slice is completed.
- parallel cuts then are made 4-5 mm apart until entire proposed ictal zone and surrounding area have been sliced.





- take care when encountering *gyrus curves* (outer length of curve is much longer than inner length – use staggering cut lengths so that slices converging at center of curve do not all join at common point or come so close together as to severely damage cortex).
- *pial bleeding* at blade insertion point usually is controlled with bipolar cautery or small square of thrombin-soaked Gelfoam; significant subpial hemorrhage should not occur.

BIBLIOGRAPHY for ch. “Epilepsy and Seizures” → follow this [LINK](#)