


Managing Tremor In MS

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- Can MS tremor be managed?

Significance of MS Tremor

- Tremor is the most common involuntary movement disorder.
- Prevalence of tremor in MS reported 25 to 75%
 - 27% to 33% disabling tremor
 - 5% to 10% severe incapacitating tremor
- Associated with disease duration, course and level of disability/EDSS
- Significant impact on ADL's and employment

Features of MS Tremor

- Affected body part
 - Arms 55% bilateral>unilateral
 - Legs and head 7% to10%
 - Trunk 5%
 - Face and tongue-infrequent
- Correlates with tremor severity
 - Dysarthria
 - Dysmetria and dysdiadokinesia
 - Walking time
 - Not nystagmus

Types of Tremor

- Rest tremor-in the absence of voluntarily activity in a completely supported limb
- Action tremor-in a voluntary contraction of muscle or movement and includes
 - Postural tremor-maintain posture against gravity
 - Kinetic tremor-with any voluntary movement
 - Intention tremor-with target directed movement
 - Isometric tremor-muscle contraction against rigid object
 - Task-specific tremor-with specific activities/performance

Anatomical Localization

- Presence of multiple lesions
- Involve Cerebellar afferent or efferent pathways
- Superior cerebellar peduncle
- Brainstem: Pons>Medulla>Midbrain
- Cerebellum hemispheres
- Thalamus

Assessing Tremor

- Body part
- State of activity
- Posture
- Type of movement
- Anatomical site: proximal or distal
- Severity
- Contributing factors

MS Tremor

- Most common is action
- Postural, kinetic or intention
- Proximal, distal or both
- Rhythmic or arrhythmic oscillations
- No established measure of MS tremor

Non Pharmacologic Management of MS Tremor

- Occupational therapy
 - Equipment assist ADL's
 - Adaptive devices
 - Provide modified self-care strategies
 - Compensatory techniques
 - Wrist weights 400-600g, bracing or immobilize limb, computer controlled damping devices
- Physiotherapy
 - Mobility aids/safety
 - Gait training
 - Exercise programmes
 - Balance
 - strengthening

Pharmacologic Management of MS Tremor

- Action tremor
 - Isoniazid: 600-1600mg/day, supplement B6
 - Carbamazepine: 400-600mg/day
 - Ondansetron: 8mg/day
 - Clonazepam: 1.5 -6mg/day
 - Gabapentin: 1200mg/day

Pharmacologic Management of MS Tremor

- Postural tremor
 - Propranolol: 160-240mg/day
 - Primidone: 62.5-200mg/day
- Tremor/ataxia
 - Tetrahydrocannabinol: 5-15mg/day

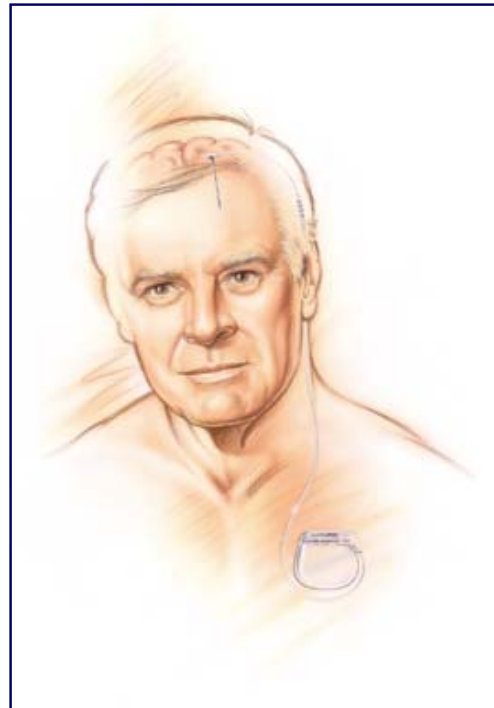
Surgical Management of MS Tremor

- Stereotactic thalamotomy
 - Used to Rx MS tremor 1960's
 - Improve intention and postural tremor
 - Study results are difficult to interpret and generalize
 - Target localization and lesion formation dependent on patient intraoperative response
 - Ventrolateral nuclei
 - Ventrointeromedial (VIM) nucleus
 - Ventralis oralis posterior (VOP)
 - Zona incerta (ZI)

Surgical Management of MS Tremor

- Thalamic Deep Brain Stimulation (DBS)
 - Used to Rx MS tremor 1980's
 - Offers non-ablative surgical alternative
 - Rx bilateral tremor
 - Benefit of tremor suppression may not correlate with functional improvement
 - Target localization and lesion formation dependent on patient intraoperative response
 - Ventrointeromedial nucleus
 - Ventralis oralis posterior

Deep Brain Stimulation



Surgical Management MS Tremor

- Patient selection criteria
 - Severe or disabling tremor
 - Failure to respond to medical treatment
 - Absence of other severe sensory or motor impairment that would limit function
 - Clinically stable disease 3 to 6 months
 - Preserved cognitive function

Contraindications for Surgical Management

- Cognitive Impairment
- Severe dysarthria or Dysphagia
- Severe Cerebral atrophy
- MRI T2 lesions in surgical target site
- Severe cerebellar ataxia

Surgical Management of MS Tremor Adverse Events

- More common in thalamotomy with 20-40% long-term complications
- Many are transitory
- Adverse events
 - Paresis-Intracerebral hemorrhage
 - Seizures
 - Dysarthria
 - Wound infection
 - MS exacerbation
 - Worsening of tremor or ataxia
 - Paraesthesia with onset of stimulation

Surgical Outcomes

- Tremor improvement 64-88%
- Functional or ADL improvement 75%
- Frequent reduction in benefit over 1 year
 - Disease progression vs loss of Rx benefit
 - DBS required reprogramming to maintain optimal tremor control

Challenge in Managing MS Tremor

- Lack of reliable assessment measures of MS tremor
- Ability to differentiate between MS tremor and ataxia
- Difficult to localize origin of tremor
- Ineffective pharmacologic treatment
- Associated with advanced disease state