

Introduction

- Deep brain stimulation (DBS) is a proven effective therapy for advanced Parkinson's disease (PD).
- Traditionally it is done under microelectrode recording (MER) guidance.
- MER increases precision; also cost, artefacts, time
- No comparative study with/without MER

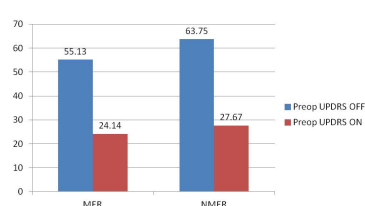
Methods

- Retrospective study from 2009-2017
- Age < 70, UPDRS > 35
- Uptil 2013- with MER, From Jan 2014- No MER
- Local anesthesia
- Single surgeon
- Subthalamic (STN) DBS for advanced Parkinson's.
- Intraop examination with 1-5 V, 130Hz, 60uS
- Postop CT
- Periodic evaluations with electrical settings
- Formal evaluation at 12 months
- Primary outcome: UPDRS scores
- Secondary outcome: Subjective improvement: Tremor, Rigidity, Bradykinesia, Dyskinesia, Postural instability, Gait
- Complications
- ANOVA and Paired t test

Results

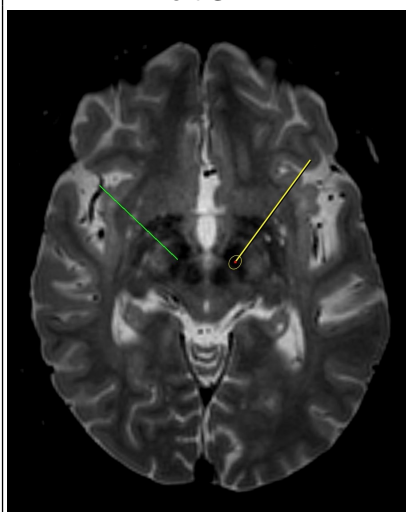
- 68 (20 females) patients with mean age of 56.07 ± 9.07 years
- 39: MER group, 29 Non MER group (NMER)

Preoperative UPDRS scores



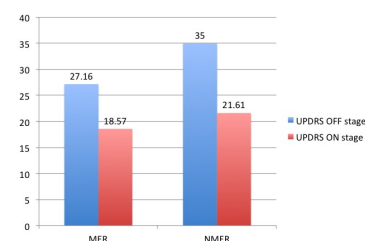
No intergroup difference. OFF state P value- 0.17, ON state P value - 0.46. Significant intragroup difference P < .01

Left STN



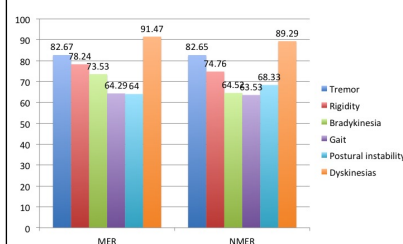
Target 3mm lateral to the tangents along red nucleus

Postoperative UPDRS Scores



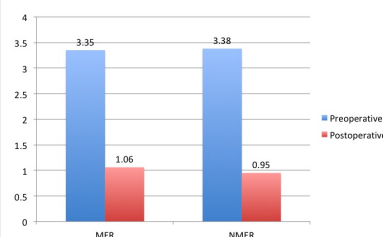
No intergroup differences. OFF stage: P value-0.11, ON stage: P value-0.35. Significant intragroup differences P < 0.01

Secondary outcomes



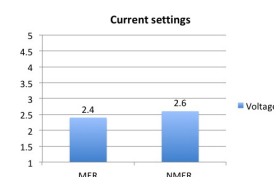
P values- Not significant

Number of drugs



No intergroup difference. Preop P value- 0.93, Postop P value- 0.6. Significant intragroup pre and postop differences, P- < 0.001

Current settings



P value- 0.74

Complications

- One symptomatic hemorrhage with MER
- One infection (requiring implant removal) with MER
- One patient required pallidotomy in MER group

Discussion

- Single team- uniformity
- First of its kind study
- No added advantage of MER in our study
- MER group had complications
- Newer electrode designs and rechargeable batteries are available

Limitations

- Retrospective study (Prospective RCT is recommended)
- MER left only after gaining experience
- No comparison for operative time

Learning Objectives

- Best predictor of success is strict adherence to plan and intraop examination
- MER increases chances of hemorrhage, artefacts, operative time, cost
- MER is not mandatory for STN-DBS

Conclusions

- After attaining adequate experience with stereotaxy and DBS, one can forego MER in STN-DBS.
- It reduces risk of hemorrhage, operative time and cost.

References

- Foltynie T et al. MRI-guided STN DBS in Parkinson's disease without microelectrode recording: efficacy and safety. J Neurol Neurosurg Psychiatry 2011;82:358-63.
- Nakajima T et al. MRI-guided subthalamic nucleus deep brain stimulation without microelectrode recording: can we dispense with surgery under local anaesthesia? Stereotact Funct Neurosurg 2011;89:318-25
- Burchiel KJ et al. Accuracy of deep brain stimulation electrode placement using intraoperative computed tomography without microelectrode recording. J Neurosurg 2013;119:301-6