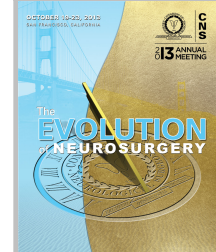


Stereotactic Radiosurgery for the treatment of Intractable Epilepsy: An Evidence-based Review

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Learning Objectives

By the conclusion of this session participants should be able to:

- 1) Understand key hypothesis that explain the anti-epileptic action of focussed radiation,
- 2) Identify epilepsy syndromes commonly treated with radiosurgery,
- 3) Discuss in small groups available literature on radiosurgical treatment of epilepsy.

Introduction

- To analyze the available literature on radiosurgery for epilepsy, evaluating efficacy of seizure control, complications and long-term effects.

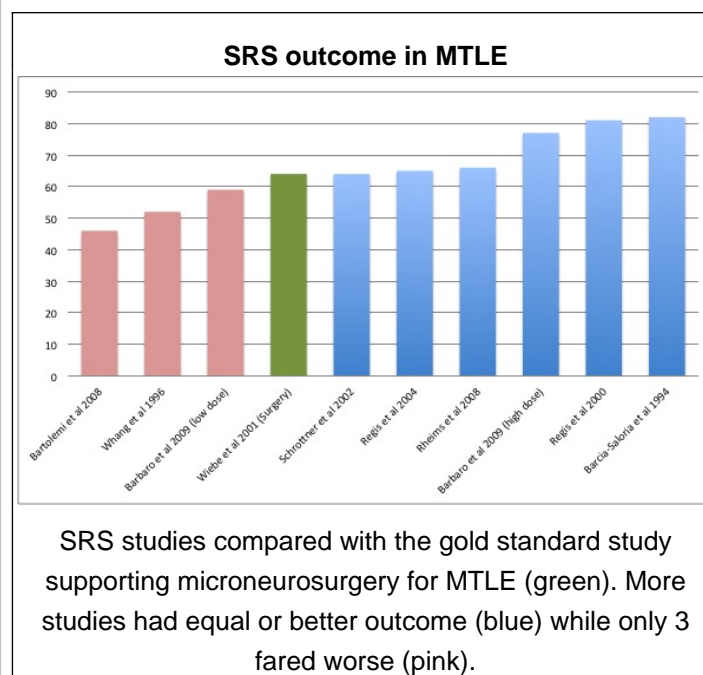
- To classify selected studies according to the Oxford Evidence-Based Medicine Classification system so as to determine strength of evidence.

Methods

- A systematic review was performed of peer-reviewed articles on radiosurgery for epilepsy using search terms "epilepsy" and "radiosurgery" in Pubmed and SCI.
- Working through 365 hits, 82 relevant papers were selected and reviewed.
- These 82 papers were classified using the Oxford Evidence-Based Medicine classification system and weighed according to the strengths of design and trial execution.
- Classification system: Level 1 - RCT, Level 2 - Cohort, Level 3 - case control, Level 4 - case reports, Level 5 - expert opinion and experimental studies

Results

- Three Level I, 30 Level II, 3 Level III, 22 Level IV, 17 Level V and 7 experimental studies totalling to 82 were reviewed.
- Across evidence levels radiosurgery was seen as effective for controlling seizures in 2/3rd of the patients.
- Commonly treated epilepsy syndromes were medial temporal lobe epilepsy (MTLE) and gelastic seizures in hypothalamic hamartoma.
- Seizure remission took an average of 12 to 24 months but was durable once achieved.
- No significant neuro-psychological deficits were seen while cerebral edema or radionecrosis were treated with steroids.
- Mechanisms by which sublethal radiosurgery affects neuronal function were not elucidated.



Conclusions

Radiosurgery for epilepsy is a feasible, less invasive alternative to open surgical resection. Studies available at this time show comparable results in terms of outcome and efficacy with a low side-effect profile. Both basic experimental and multi-centre randomized control trials are needed to develop evidence-based strategies and physiological targeting for radiosurgery. Nevertheless, radiosurgery currently qualifies as a grade B recommendation for treating epilepsy.

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