

Introduction

Brain tumor surgery requires good planning and specific tools such ultrasonic aspirator, bipolar, microsurgical instruments. The use of new tools or equipment to enable better outcomes and improves quality of life is mandatory. Microwave Ablation (MW) is a technique used from other field since 2005 in liver, thyroid tumor with good results. With imaging guidance, the tumor is localized, and a thin (14.5-gauge) microwave antenna is placed directly into the tumor. A microwave generator emits an electromagnetic wave through the exposed, noninsulated portion of the antenna.(1).

Learning Objectives

The participants should be able to understand the new application technique for surgery of the Brain Tumor

Methods

Nine cases are described with Brain tumors ,Two Astrocytoms and four Glioblastoma Multiforme(GBM).One Cordoma and One Metastasis, Treated with Microwave Ablation during conventional surgery. All cases the tumor was localized with image guidance by using Trans-operative Ultrasound Aloka 5500. A thin (14.5-gauge)antenna .(MEDWAVES) and energy was applied for 1- 3 minutes until the temperature sensor at proximal position of the 4-cm antenna reached 70-90°Celsius

The cortical brain surface temperature registered 32 to 34 degrees Celsius during the ablation process.

Cavitation and ablation was observed, and adjacent vascular and brain structures were preserved, visualized by surgical microscope and Doppler ultrasound Trans-operative.

Histopathological results of Astrocytoms and Glioblastoma Multiforme,Cordoma,and metastasis were confirmed

Results

The Application of MW Ablation Intratumoral during Brain surgery was Safe, in All Cases no additional neurological deficit was detected.

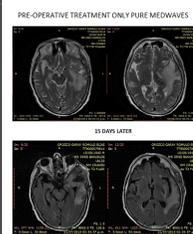
The Brain temperature around of the tumor was 32 to 34 Celsius grades.

The intratumoral vascular flow was decreased,and the tumor was more easy removed.

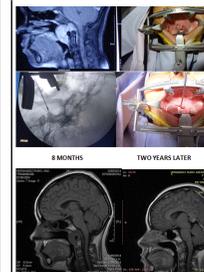
BRAIN METASTASIS



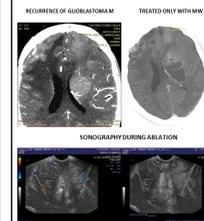
MRI PRE - POST TREATMENT WITH MW



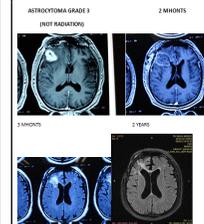
CORDOMA TREATED WITH MW



RECURRENCE OF GLOIBASTOMA M TREATED ONLY MW



ASTROCYTOMA GRADE 3



NOT RADIATION



Movie



Movie

Conclusions

- 1.-Microwave Ablation is excellent tool for Brain Tumors Surgery
- 2- Was safe in all cases
- 3.-Decrease Intratumoral Blood Flow , Therefore enable the microsurgical resection.
- 4.-The only use of microwave in brain surgery seem to be effective in the treatment of brain tumors
- 5.-The Life expectancy of High Grade of Gliomas was more 15 months, and Karnofsky score was more more 80 the first 12 months

References

1. Microwave ablation: principles and applications
Simon CJ1, Dupuy DE, Mayo-smith ww
Radiographics 2005 oct;25 Suppl 1:S69-83
- 2.-Microwave Tissue Ablation: Biophysics, Technology and Applications
Christopher L. Brace, PhD
Crit Rev Biomed Eng 2010, 38(1) 65-78