*Surgical perspective: Neurosurgical Approach to Brain Tumors*

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*Highlights*

- *Preoperative functional MRI and magnetic source imaging can be used to determine motor and language function in patients with brain tumor*
- *Preoperative images can be loaded into intraoperative navigation systems for tumor resection*
- *Intraoperative cortical mapping can determine motor and language function in brain tumor surgery*
- *Direct cortical mapping can be correlated to preoperative imaging through the intraoperative navigation system*
- *Intraoperative MR can determine extent of resection and can be registered to the intraoperative navigation system for further tumor resection*
- *The role of correlation of intraoperative and postoperative imaging after tumor resection is unknown at present.*

*Target Audience:* Neuroradiologists, Neurosurgeons, Neuro Oncologists, Medical Oncologists, Neurologists, Brain tumor and brain imaging researchers

*Objectives*: Understand the role of preoperative and intraoperative imaging techniques to improve extent of resection while minimizing neurosurgical complications in brain tumor resection.

*Purpose:* Demonstrate neurosurgical questions that MR imaging can answer in preoperative and intraoperative setting.

*Methods:* Review of case material and methods utilized in brain tumor surgery with emphasis on imaging technologies.

*Results:* Many preoperative and intraoperative techniques are available to decrease surgical complications, decrease neurosurgical injury, and improve extent of tumor resection.

*Discussion:* Successful utilization of these techniques is outlined as well as pitfalls and limitations of current imaging will be discussed.

*Conclusion:* MR imaging plays an intregral role in brain tumor surgery both from a preoperative and intraoperative standpoint.

*References:*

Garber S and Jensen RL: Image guidance brain metastases resection. Surgical Neurology International, 2012;3(Suppl 2):S111-7. Epub 2012 Apr 26. PMID: 22826814

Prabhu SS, Gasco J, Tummala S, Weinberg JS, Rao G. Intraoperative magnetic resonance imaging-guided tractography with integrated monopolar subcortical functional mapping for resection of brain tumors. Clinical article.J Neurosurg. 2011 Mar;114(3):719-26. PMID: 20964594

Young RJ, Brennan N, Fraser JF, Brennan C. Advanced imaging in brain tumor surgery. Neuroimaging Clin N Am. 2010 Aug;20(3):311-35. PMID: 20708549