

Multifunctional Use of Cortical Stimulator During Brain Tumor Resection Alvin Chan BS; Sumeet Vadera MD Department of Neurological Surgery University of California, Irvine

## Introduction

Neurosurgeons use Ojemann cortical stimulators to localize and map cortical and subcortical regions of the brain to avoid resection or damage to functional cortex intraoperatively. Here we describe a technique whereby a handheld Ojemann cortical stimulator is used to retract cerebral parenchyma while simultaneously stimulating descending white matter tracts to prevent accidental transection of white matter tracts involved with motor function.

## Methods

Once a stimulation threshold was obtained, a corticectomy is performed to begin resecting the tumor. During subpial aspiration, the stimulator is placed in the surgeon's non-dominant hand and continuous stimulation is performed. The stimulator is used to gentle retract the tumor so that the underlying plane can be visualized and aspiration can be performed and the tips of the stimulator are constantly stimulating the leading edge of the resection cavity within the white matter to assess in real-time whether any motor stimulation is obtained which immediately alerts the surgeon to stop resection in the current trajectory.

# Results

While using this technique, the surgeon has encountered several surgical corridors in which motor stimulation was encountered when the stimulator was in contact. The surgeon was able to immediately change the surgical trajectory and avoid injury to these white matter tracts well before injury to the white matter tracts could occur. No adverse effects have been noted with the use of this technique and no permanent neurological deficits have been encountered.



Tumor retraction and white matter stimulation

#### Conclusions

Here we show that the Ojemann cortical stimulator can be used as an effective retraction tool as well as a cerebral parenchyma stimulator, effectively preventing accidental injury to functional tissue while concurrently giving the neurosurgeon a free hand to perform other tasks.

## Learning Objectives

By the conclusion of this session, participants should be able to do the following: 1) Describe the importance of properly identifying descending fiber tracts to avoid accidental injury during tumor resection; 2) Discuss in small groups what else can be done with the free hand if the cortical stimulator acts as both a retractor and descending fiber tract stimulator; 3) Identify crucial anatomic regions of the brain where this technique could be potentially useful.

#### References

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