

# Minimally Invasive Tubular Retractor-Assisted Biopsy and Resection of Subcortical Intra-Axial Gliomas and other Neoplasms Kelly Gassie; Olindi Wijesekera; Kaisorn L. Chaichana MD

### Introduction

Deep-seated, subcortical tumors represent a surgical challenge. The traditional approach to these lesions involve large craniotomies, fixed retractor systems, and extensive white matter dissection, each with their own associated morbidity. We describe our experience with the use of tubular retractors for accessing these deep-seated lesions

#### Methods

Fifty consecutive patients operated on for an intra-axial brain tumor (both biopsies and resection) from January 2016 to December 2017 by a single surgeon using tubular retractors with exoscopic visualization were prospectively identified and included in this consecutive case series.

# Results

35 patients (70%) underwent surgical resection and 15 (30%) underwent excisional biopsy for tumors located a median [interquartile range (IQR)] distance of 5.4 [4.5-6.1] cm below the cortical surface within the thalamus and/or basal ganglia in 12 (24%), centrum semiovale in 17 (34%), cerebellar in 8 (16%), peri-Rolandic in 6 (12%), visual tracts in 5 (10%), and intraventricular in 2 (4%). The median [IQR] percent resection was 100 [95-100]% and all patients had diagnostic tissue. Pathology was high grade glioma in 30 (60%), metastatic in 14 (28%), and cavernoma in 2 (4%). The postoperative median [IQR] KPS was 80 [80-90], where 18 (36%) had improved, 29 (58%) stable, and 3 (6%) worsened KPS as compared to preoperatively.

## Conclusions

The tubular retractor is a useful tool in the armamentarium of brain tumor surgery, and the exoscope provides an ergonomic means of visualizing the surgical field. It is meant to be used as a tool to access and resect deep-seated lesions while preserving and displacing superficial white matter tracts and cortical regions, provide a protected corridor to minimize inadvertent tissue injury during the resection, and

### Learning Objectives

1. The tubular retractor is a useful tool in the armamentarium of brain tumor surgery

2. It is meant to be used as a tool to access and resect deep-seated lesions while preserving and displacing superficial white matter tracts and cortical regions, provide a protected corridor to minimize inadvertent tissue injury during the resection, and circumferential tissue retraction to minimize risk of ischemia and damage to white matter tracts.

3. The ideal lesions are those that are deep-seated below the depth of the sulcus, easily distinguishable from normal parenchyma, and not significantly vascular

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Example of Lesion Resected Using MIS Tubular Retractor



Posterior Fossa Lesion using MIS Tubular Retractor