

Minimally Invasive Resection of Rolandic Cavernomas in Children using a Novel Navigable Tubular Retractor System

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Introduction

Resection of symptomatic hemorrhagic rolandic cavernomas in children is often challenging due to the impact of conventional retractors on the immature cortex combined with the eloquence of the motor strip. Alternatively, observation alone is associated with rehemorrhage rates of 11-18% within the first three years, each with a 29% risk of permanent neurological morbidity. Modern navigable tubular retractors combined with a transsulcal approach offer a minimally invasive alternative to traditional microscopic resection and may limit white matter injury by dissipating the retractor force radially.

Methods

We present two patients with symptomatic hemorrhagic cavernomas within the precentral gyrus radiographically and confirmed with intraoperative phase reversal. Patient, lesion, and operative results details were recorded.

Results

Both patients were male, ages 12 and 15 years of age, with hemorrhagic cavernomas (volumes 8 and 10 cc respectively) within the left frontal precentral gyrus, associated with transient arm weakness at the time of diagnosis. They underwent a small 3 cm craniotomy, phase reversal mapping of the motor strip and minimally invasive resection of their cavernoma and associated clot with a navigable tubular retractor system. Operative time was around 2 hours. Both lesions were completely resected without neurologic sequelae or seizures. Patients were discharged at 23 hrs and 48 hrs

Conclusions

Management of symptomatic hemorrhagic cavernomas of the rolandic region are challenging due to their intimate relationship with the motor strip. We present two patients that presented with transient arm hemiplegia, who underwent complete resection of their cavernoma via a transsulcal approach with a navigable tubular retractor system and remain neurologically intact. This minimally invasive approach allows for improved access to rolandic lesions and is associated superior neurologic outcomes in the short term and long term as it eliminates the lifelong risk of future hemorrhage and associated permanent morbidity.

Learning Objectives

Minimally invasive tubular retraction system may be used to achieve adequate resection of pediatric cavernomas.

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