SUBCORTICAL
SURGERY GROUP

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CASE REVIEW: Left Frontal Lobe, High-Grade, Primary Brain Neoplasm

Clinical Presentation

Patient is a 54-year-old right-handed female with no significant past medical history. She presented with c/o two months of nausea, vomiting, 40lbs weight loss, anorexia, fatigue and confusion. She went to an outside hospital ED where the head CT demonstrated left frontal hypodensity and mass effect, effacement of frontal horn of ventricle which was concerning for an underlying mass. CT abdominal/pelvis contrasted unremarkable. Transferred to Cleveland Clinic for further care.

MRI showed a **7.8 x 6.2 x 5.8 cm left frontal lobe lesion** causing a large amount of mass effect. It was suspected to be a high-grade primary brain neoplasm.

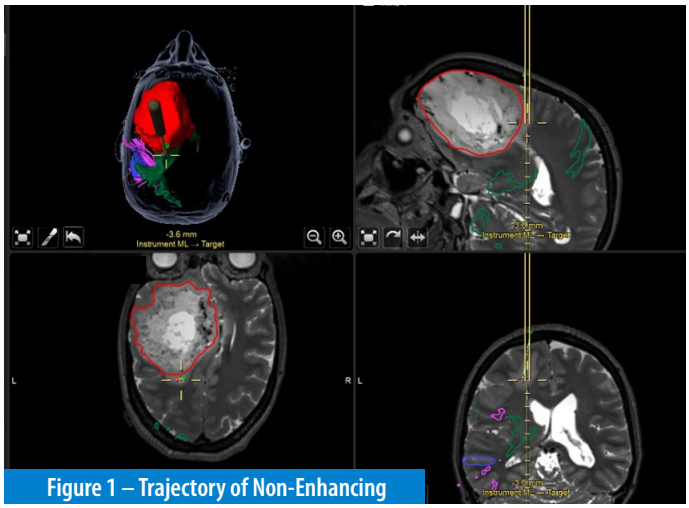


Figure 1 – Trajectory of Non-Enhancing

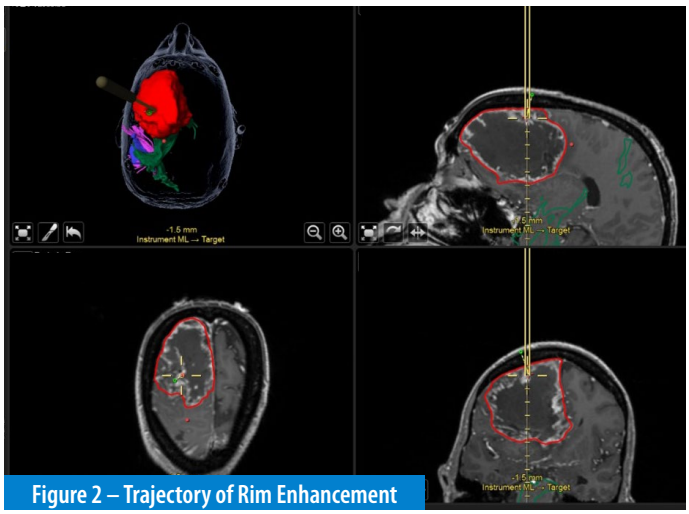


Figure 2 – Trajectory of Rim Enhancement

Surgical Management

Prior to the case, three trajectories were chosen to allow a definitive diagnostic biopsy of the lesion and surrounding tissues. (See figures 1-3.) **The goal was to capture three distinct samples at and around the neoplasm to include: non-enhancing, rim enhancement and central core.** Each sample was sent to the lab for immunoprofiling.

Based on current practice, most tissue sent to pathology is typically from the central core of the tumor. The enhancing rim typically goes into the suction canister by use of a sucker; if a suction trap is used, it will be sent to pathology. Even if a gross total resection is achieved, non-enhancing infiltrative tumor typically remains in the patient for adjuvant treatment after surgery. The recurrent treatment regimen was created with the markers provided to pathology from initial surgical resection of the tumors central core or enhancing rim.

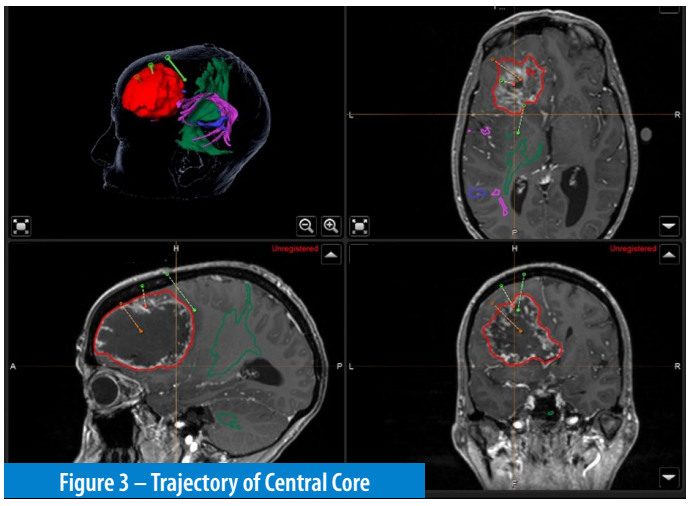


Figure 3 – Trajectory of Central Core

With new technology and capabilities in the operating room, the concept was to evaluate if there are differences between the markers/ immunoprofile found in these three distinct tumor regions. During surgery, a navigated, automated, tissue resection device with a closed preservation system (NICO Corp, Indianapolis, IN) was used to capture fresh tissues. (See figure 4.)

We annotated each location prior to tumor removal, which enabled us to analyze the molecular profile of each area separately. All tissue was intraoperatively collected using an automated preservation system designed to minimize tissue degradation and preserve tissue which allows immediate biological preservation of collected tissues. (See figure 5.)

Coupling the navigation device on the Myriad while automating the intraoperative collection of tissue by region, and simultaneously biologically preserving the sample, created a unique system for tissue capture. Resection with tissue capture was accomplished adding less than 10 minutes to the total surgical time.

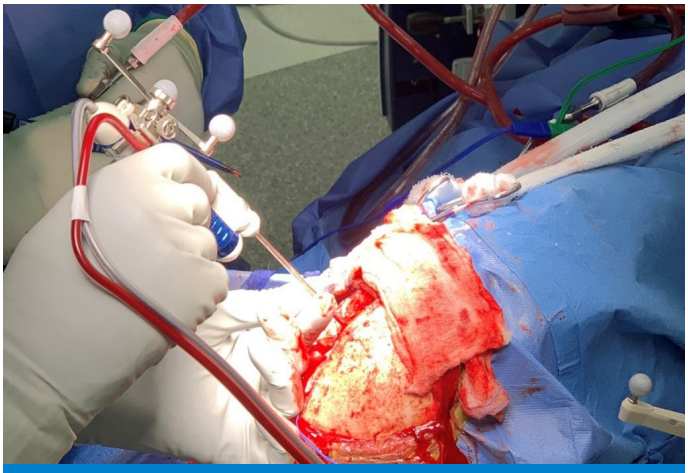


Figure 4 – Myriad automated resection technology (NICO Corporation)

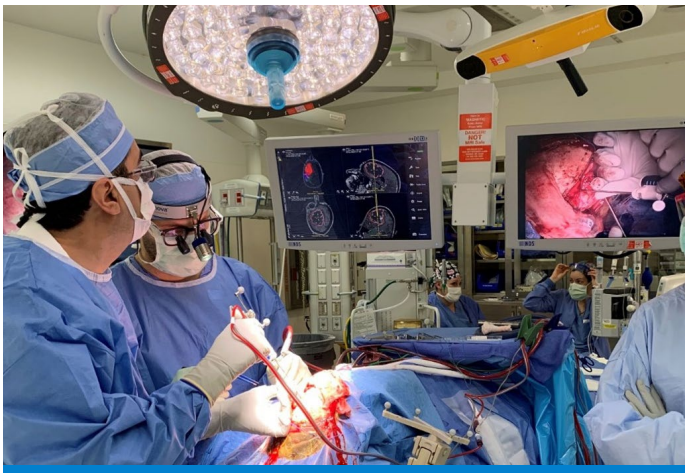
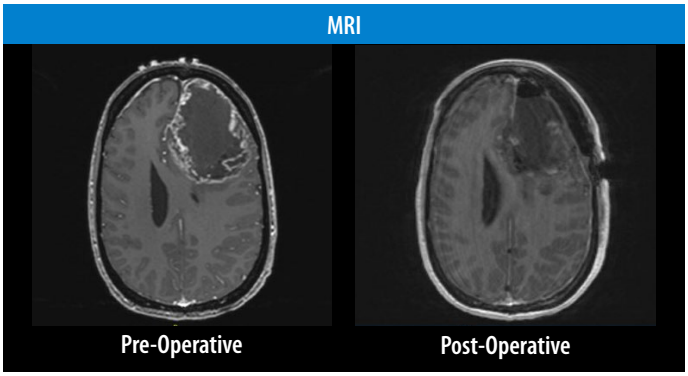


Figure 5 – Automated Preservation System (APS) (NICO Corporation)



Clinical Course & Outcomes

The patient spent one night in SDU (stepdown unit) and two nights in RNF (regular nursing floor) as with our standard craniotomy procedures, with no additional care needed per study. The case was done as part of a study sponsored by NICO. Results will be presented/published when all 20 cases are completed and analyzed. Preliminary results of the first 5 patients are encouraging and will be presented at the CNS and SNO meetings.

If you have a notable case review to share, please contact us at info@SubcorticalSurgery.com