



## SSG CASE REVIEW SERIES

### Overview: The Use of a Parafascicular Approach to Gain GTR

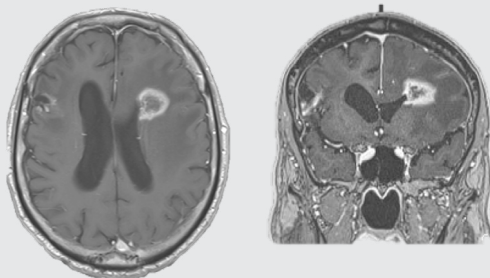
This is a four-patient case series involving three secondary tumors ranging from ~1.8cm - ~3.5cm and two lesions that pathology later deemed radiation necrosis. The lesions were located in the frontal, temporal and parietal lobes. Four of the five lesions were removed using a parafascicular surgical approach that involved: trajectory planning, navigation, trans-sulcal access with a navigable tubular retractor system, automated resection, and exoscopic visualization. Gross total resection was achieved in all five lesions.

### Clinical Presentation and Surgical Management:

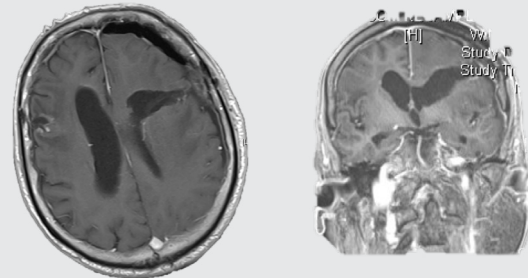
#### Case 1: Recurrent Metastasis vs. Radiation Necrosis

Patient is a 71-year-old, right-handed male with a four-year history of adenocarcinoma of the lung and known multiple metastases to the brain. He initially received whole brain radiation therapy at an outside hospital. This was followed by stereotactic radiosurgery (SRS). He most recently received SRS to a left frontal lesion six months prior to presentation. He presented to the ED and was subsequently admitted for worsening confusion, word finding difficulty, and shuffling gait. MRI of the brain revealed substantial radiographic progression of the left frontal metastasis that had undergone SRS prior. Recurrent metastatic disease versus radiation necrosis was considered. The lesion was present at the corner of the left frontal horn of the lateral ventricle. **Given the lesion was symptomatic, edematous, >2cm, surgically accessible, enlarging post-radiation, and the patient had controlled systemic disease, surgical resection was recommended.** Based on the deep location at the base of a sulcus and the desire to be minimally invasive, he underwent a parafascicular approach for resection. Pathology proved to be radiation necrosis.

Pre-Operative Images



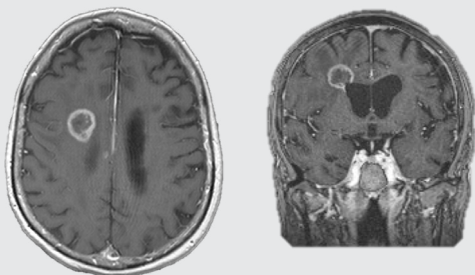
Post-Operative Images



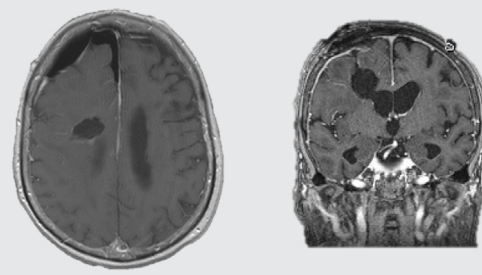
#### Case 2: Recurrent Metastasis vs. Radiation Necrosis

Patient is a 77-year-old female with a history of non-small cell carcinoma of the left lung with multiple known intracranial metastases that were status post SRS. After enlargement of a left posterior temporal lesion bordering the atrium to ~3.5cm, laser interstitial thermal therapy (LITT) was performed five months prior to current presentation. The patient did quite well initially. She left the hospital on post-op day one and her treated lesion continued to demonstrate expected appearance on three month post-op MRI. However, the patient recently presented with significant enlargement of a different post-SRS right frontal lesion. The surrounding edema was deemed a likely contributor to worsening left lower extremity weakness and difficulty ambulating. Recurrent metastatic disease versus radiation necrosis was considered. **The right frontal lesion bordered on the lateral wall of the lateral ventricle, which would make it a difficult LITT case with neighboring heat sink. Furthermore, given its symptomatic nature with substantial edema, there was fear that post-LITT swelling would provide too slow of an improvement with strength.** With a goal of optimal treatment and symptomatic relief, resection was deemed in her best interest. A parafascicular approach was enacted due to the positioning of the lesion. Pathology proved to be radiation necrosis.

Pre-Operative Images

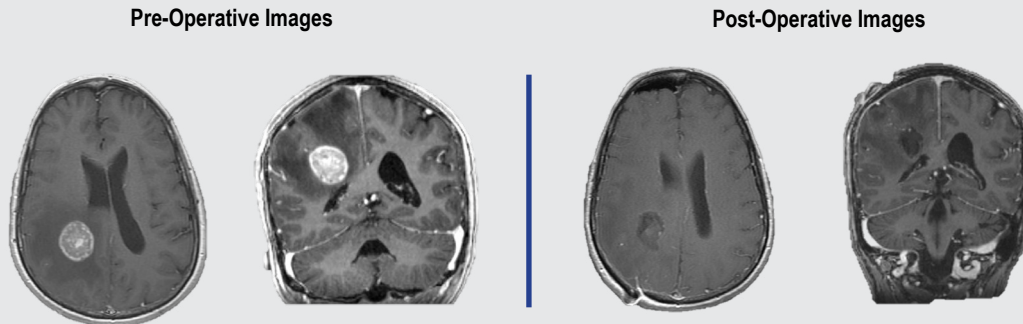


Post-Operative Images



### Case 3: Colorectal Metastasis

Patient is a 63-year-old, right-handed female with past medical history of metastatic colorectal carcinoma to lung and bone (status post left thoracoscopy with wedge resection), chemotherapy-induced neuropathy, and hyperlipidemia. The patient presented with a new solitary, deep right parietal brain lesion identified on MRI scan. She had intermittent left-sided neglect and headaches that were waxing and waning. Her course has been complicated. She had undergone a laparoscopic sigmoid colectomy five years prior with pathology revealing adenocarcinoma with negative margins. She then suffered recurrent disease at L5 and was treated with kyphoplasty and palliative radiation therapy, undergoing FOLFOX x 12 cycles that was complicated by neuropathy. This was followed by development of a new pulmonary nodule, a lingular mass (subsequently resected), positive retroperitoneal lymph nodes with questionable peritoneal carcinomatosis, and additional left lower lobe hypermetabolic areas identified on FDG one month prior to presentation. At the time of discovery of the new brain lesion, a new T6 lesion was also discovered that would ultimately receive treatment once the intracranial lesion was addressed. She was discharged to return for elective craniotomy for tumor resection. **Given the deep location at the base of a sulcus, a parafascicular approach was enacted.** Frozen pathology confirmed poorly differentiated adenocarcinoma.



### Case 4: Lung Metastasis

Patient is a 55-year-old, right-handed female who presented for evaluation of presumed metastatic papillary adenocarcinoma of the lung, a diagnosis made recently by outside hospital biopsy. The patient had two separate intracranial lesions: ~3.4cm in the deep right inferior parietal lobe and ~1.8cm in the left fronto-parietal lobe overlying the leg motor area. Of note, she did not appear to have bulky systemic disease and had not yet had a biopsy of what was believed to be involved paratracheal lymph nodes. Regardless, the intracranial lesions required addressing first. She reported unsteadiness and decreased strength in her right leg (especially noting foot drop), likely attributable to the left-sided lesion given the location. **The need and feasibility for surgery likely followed by SRS in order to treat the two intracranial lesions was discussed. The ~3.4cm lesion warranted resection due to its size. Resection was favored for the ~1.8cm due to its symptomatic nature and location in the motor strip.** A decision was made to remove both lesions in one operation. The larger lesion was deemed appropriate for a parafascicular approach. The smaller lesion required intraoperative motor mapping and traditional craniotomy. Pathology confirmed lung adenocarcinoma with papillary features for both lesions.

