



A Rare Case of Pulmonary Metastasis from Malignant Intracranial Meningioma

Authors: Rushi Patel, OMS-III; Ronak Patel, DO, Advocate Lutheran General PGY-2; Jason Macklis, MD Advocate Lutheran General
Riverside Medical Center, Kankakee, Illinois



Background

- Meningiomas are the most common primary central nervous system (CNS) neoplasms arising from the meninges.
- Although typically benign, they can rarely metastasize to an extracranial location including the lungs, bones, or liver.
- We present a case of recurrent meningioma with pulmonary metastases in an elderly patient following multiple resections and radiation treatments.
- Currently, there are no set guidelines for chemotherapy and adjuvant radiation therapy (RT)—treatment regimens are examined currently on a case-by-case basis.

Case Presentation

- Patient is an 86-year-old male who was initially diagnosed in 2013 with a WHO grade I meningioma treated with bifrontal craniotomy and resection.
- He had progression of disease along the superior sagittal sinus and was treated with RT in 2020. Imaging in 2024–2025 showed recurrent right frontal convexity and parasagittal lesions invading the superior sagittal sinus and sphenoid wing. In May 2025, he underwent embolization and gross total resection, with pathology demonstrating anaplastic (WHO grade III) meningioma with skeletal muscle invasion, followed by proton RT for postoperative progression.
- Systemic therapy with abemaciclib was initiated in October 2025. In November 2025, CT imaging during hospitalization for abdominal pain and anemia revealed a left lower-lobe pulmonary mass and multiple bilateral pulmonary nodules, with biopsy confirming metastatic malignant meningioma.

Images

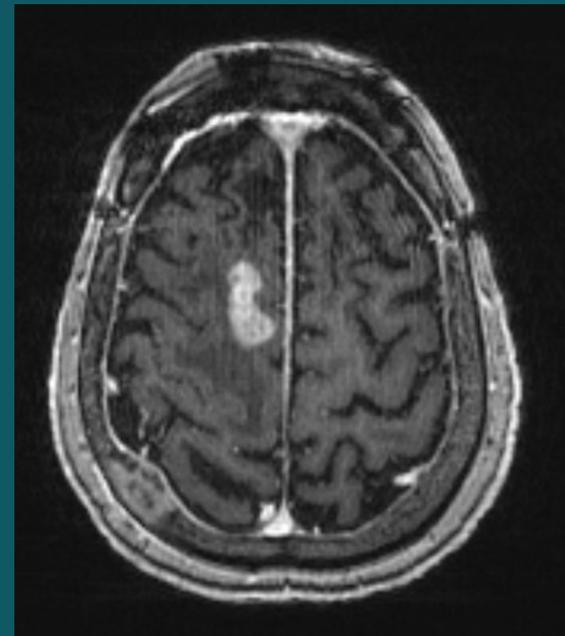


Image 1: CT scan showing right parafalcine meningioma with extension into the right superior frontal gyrus and overlying calvarium



Image 2: CT scan showing medial left lower lobe pulmonary mass, measuring 4.2 cm. Consistent with pulmonary metastasis, new from prior CT

Discussion

- The lungs represents the most common site of distant metastasis, followed by bone and liver. Proposed mechanisms of metastatic spread include hematogenous dissemination through venous sinuses, particularly in tumors involving the superior sagittal sinus, surgical seeding, and local invasion of vascular structures.
- There is no established systemic therapy for metastatic meningioma, and treatment options are largely based on limited clinical evidence.
- Targeted therapies exist, including CDK-inhibitors such as abemaciclib, are being investigated for refractory or progressive disease. Despite multimodal treatment, outcomes for metastatic grade III meningioma remain poor.

Conclusions

- Extracranial metastasis from meningioma is rare, occurring in less than 1% of cases overall, but is more frequently reported in high-grade tumors.
- Management of anaplastic meningioma remains challenging. Surgical resection followed by adjuvant radiation therapy is the standard of care, but recurrence is common.
- This case portrays the aggressive clinical course of recurrent meningioma with malignant transformation and extracranial dissemination to the lungs, highlighting ongoing challenges in surveillance, risk stratification, and management of metastatic meningioma.