

# De Novo Meningioma Presenting in a Delayed Fashion after Aneurysm Clipping

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## Abstract

A 53-year-old woman with a history of craniotomy and clipping of a left supraclinoid internal carotid artery aneurysm nine years prior and breast cancer in remission presented who was referred to a neurological surgery clinic for evaluation of a suspected brain aneurysm. Further workup with catheter angiography and magnetic resonance imaging (MRI) ultimately revealed a dural-based lesion at the site of the prior craniotomy. The patient underwent surgical resection and pathology confirmed the diagnosis of a low-grade glioma. This case highlights the importance of thorough evaluation and monitoring for patients with a history of intracranial pathology, as meningiomas may develop at the site of prior surgeries.

**Keywords:** Meningioma • Case report • Aneurysm clipping • Incidental *de novo* tumor • Long-term surveillance

## Introduction

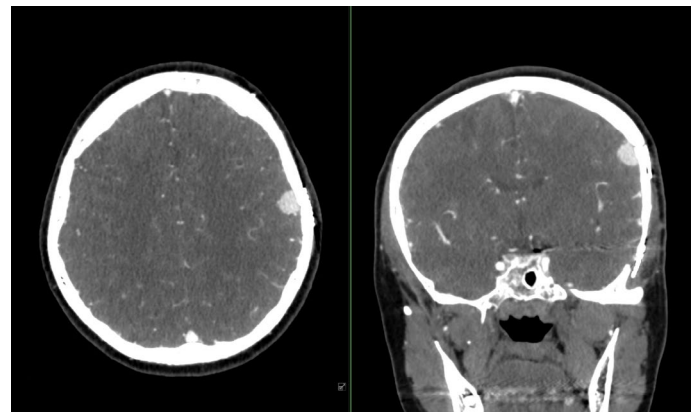
Meningiomas are the most common primary intracranial brain tumor, comprising almost 40% of all tumors and 55% of all non-malignant tumors [1]. These slow-growing tumors arise from abnormal cell growth in the meninges, the outer covering of the brain and their appearance can be similar to that of dural-based metastatic cancer. The severity of meningiomas is assessed by the World Health Organization (WHO) grading system, with grade I having a favorable prognosis. While the cause of meningiomas is unknown, risk factors include age, prior radiation to the head and the genetic disorder Neurofibromatosis type 2 (NF2) [2]. Surgery is the best treatment for the most symptomatic meningiomas. However, delayed presentation of a *de novo* meningioma after aneurysm clipping has not been described. In this case report, we present a novel case of a patient who developed a *de novo* meningioma nine years after aneurysm clipping, highlighting the importance of ongoing surveillance and follow-up imaging for patients who undergo neurosurgical procedures.

## Case Presentation

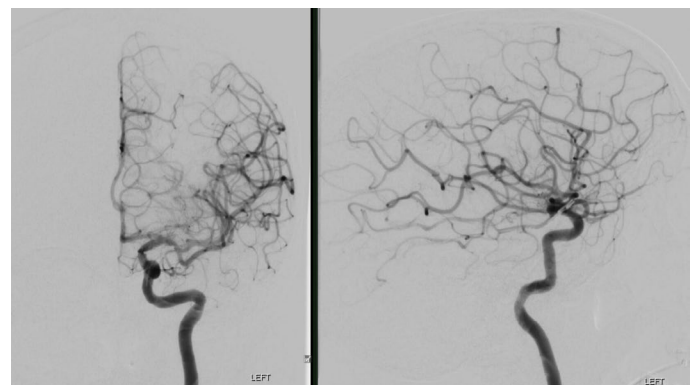
A 53-year-old woman with a history of breast cancer and an un-ruptured brain aneurysm was referred to our clinic to evaluate a possible new brain aneurysm. She underwent uncomplicated clipping of an un-ruptured left supraclinoid internal carotid artery (ICA) aneurysm nine years prior at a different institution and fully recovered. One year prior to the presentation, she began experiencing left-sided headaches that were worse in the mornings. Three weeks before the presentation, she was diagnosed with COVID infection and began experiencing vertigo. She underwent computed tomography angiography (CTA) that was interpreted as revealing a new 10 mm distal middle cerebral artery (MCA) aneurysm under her prior craniotomy flap (Figure

1). On neurological examination, she had a left frontal headache but no focal neurologic deficits. She denied any history of intravenous drug abuse or any other significant illness other than the COVID infection, from which she had recovered. Laboratory and other imaging tests were not informative.

The patient underwent an urgent cerebral angiogram that revealed no evidence of a new or recurrent brain aneurysm (Figure 2). She subsequently underwent magnetic resonance imaging (MRI) with contrast that revealed a dural-based lesion just under the prior craniotomy flap (Figure 3) corresponding to the suspected aneurysm. Due to the lack of tissue diagnosis and the unknown



**Figure 1.** Axial and coronal CTA showing 10 mm lesion under prior craniotomy site with imaging characteristics suggestive of distal MCA aneurysm.

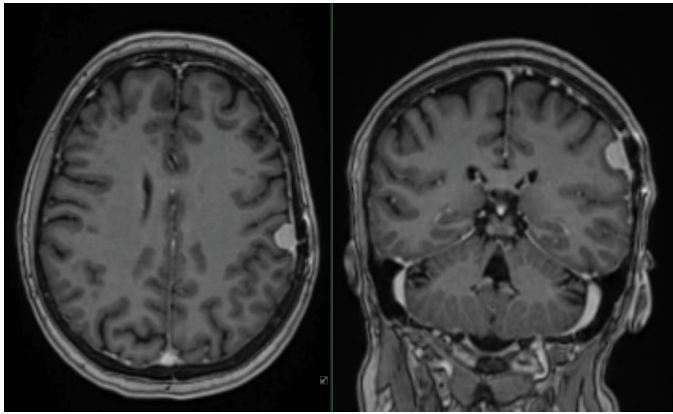


**Figure 2.** AP and lateral projections mid-arterial phase cerebral angiogram showing no recurrent or residual brain aneurysms.

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**Figure 3.** Axial and coronal T1-weighted MRI with contrast showing dural-based lesion corresponding to suspected new aneurysm.

nature of the new lesion, the patient was offered and underwent uncomplicated redo left frontal craniotomy and resection of the dural-based tumor. The final histologic diagnosis of the tumor was a World Health Organization (WHO) grade I meningioma. The patient made an uneventful recovery and will undergo a follow-up MRI at six months.

## Discussion and Conclusion

This case report highlights the importance of close surveillance imaging for patients with a history of intracranial pathology. Meningiomas are slow-growing tumors that may reach a large size before causing symptoms and this case illustrates the unique occurrence of a new meningioma developing at the same site as a previous craniotomy for an aneurysm clipping, nine years after the initial procedure. Observational studies have shown variable growth patterns for asymptomatic meningiomas, with some tumors displaying nonlinear exponential growth or no growth at all, further emphasizing the need for regular monitoring [3].

Furthermore, given the patient's history of brain aneurysm and breast cancer, recurrent brain aneurysm and dural-based metastasis were in the differential diagnosis. Although the lesion was small and not causing focal neurologic symptoms, complete work up with catheter angiography, MRI imaging and ultimately surgical resection were necessary to make a definitive diagnosis. This case illustrates the importance of thorough evaluation and work up for new brain lesions. Even in an otherwise healthy patient, it is critical to consider a wide range of potential diagnoses and to pursue a complete workup in order to make an accurate diagnosis and provide appropriate treatment.

## Acknowledgement

None.

## Statement of Ethics

As a case report, this research did not require the approval of our Institutional Review Board. Documented consent was obtained from the patient to use her clinical information and imaging results in order to advance the care of future patients.

## Conflict of Interest Statement

The authors report no conflicts of interest with this research.

## Funding Sources

None.

## Author Contributions

**Sheeny V Vo:** Background research and manuscript preparation.

**Ciarán J. Powers:** Collection of patient information and manuscript editing.

## Data Availability Statement

No specific data involved in this study is available.

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