

# Three Dimensional Rotational Angiography in Optimizing Surgical Approach in Petrotentorial Meningioma

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## INTRODUCTION

Petrotentorial meningiomas present a formidable challenge to skull base neurosurgeons due to their deep-seated location, proximity to critical neurovascular structures, and complex patterns of growth.

These tumors often displace and encase vital anatomy including the basilar artery, brainstem, and cranial nerves.

Their growth patterns are slow, which results in significant mass effect on the brainstem prior to presentation.

When patients present with these lesions, they often have cranial neuropathies, symptomatic brainstem compression, and cerebellar symptoms.

Complete resection must often be balanced against the preservation of neurological function.

Three-dimensional rotational angiography provides vital information about the vascular supply, arterial encasement, and deep venous drainage for preoperative planning. These factors should be considered when selecting the optimal surgical route to avoid devastating vascular complications.

## CASE PRESENTATION

73-year-old female who presented with headaches, tinnitus, and gait imbalance for three-months.

Her preoperative MRI revealed a 3.7x3.2x2.0cm mass with partial encasement of the basilar artery, encasement of the left AICA, and extension into Meckel's cave and the internal acoustic canal (Figure 1).

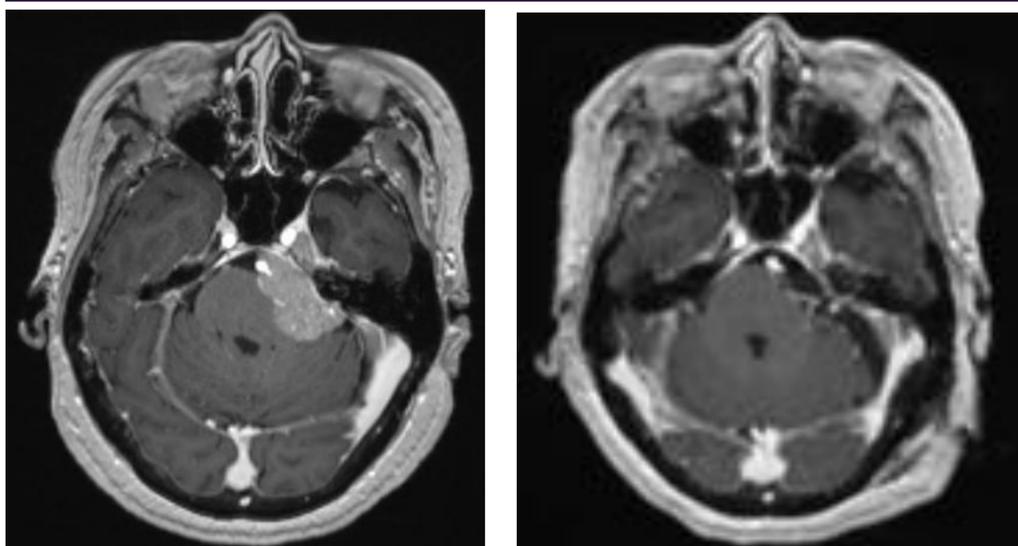
She underwent diagnostic cerebral angiogram for preoperative embolization of the tumor through the meningohypophyseal trunk with reduction in the size of the tumor blush. We determined that the initially planned transpetrosal approach would be high risk because the superior petrosal sinus was critical in normal cranial drainage of the posterior fossa (Figure 2). The absence of significant pial supply from the tumor was suggestive that the tumor would not be locally invasive

A retrosigmoid craniotomy was performed for resection of tumor. Tumor was intentionally left behind on the superior pons where it was noted to be highly adherent to the pial surface.

The 4-8<sup>th</sup> nerves were all visualized and carefully protected. The patient tolerated surgery well, though she developed a cranial nerve IV palsy after the embolization, which persisted after surgery.

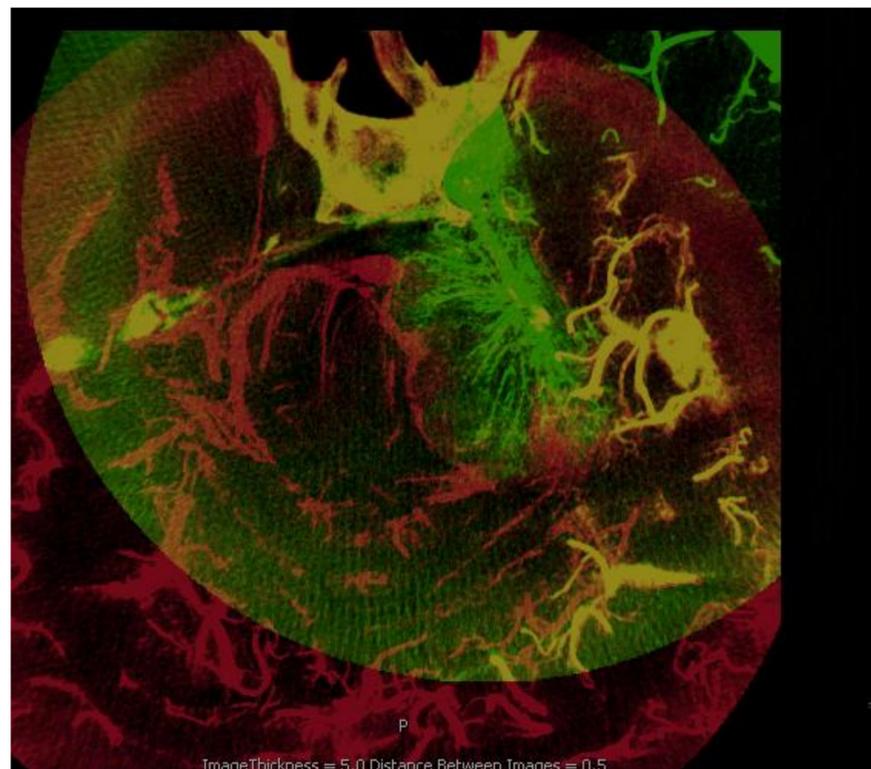
Her post-operative MRI showed gross total resection with small amount of residual along the tentorium and the brainstem (Figure 1).

## FIGURE 1



Axial post-contrast MRI imaging showing petrotentorial meningioma with vascular encasement of the basilar artery and AICA. Post-operative MRI showing gross total resection

## FIGURE 2



Fused arterial and venous phase three-dimensional rotational angiography imaging demonstrating critical vasculature for lesion.

## CONCLUSION

Surgical planning for complex skull base tumors such as petrotentorial meningiomas benefits from the use of three-dimensional rotational angiography.

These improved preoperative imaging modalities can better inform surgeons on the risk profile of certain approaches