

# Endoscopic Endonasal Devascularization in Staged Resection of Large Anterior Skull Base Meningioma

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## Introduction

Endoscopic endonasal approach (EEA) has been increasingly used for resection of anterior skull base meningiomas as an alternative to or in conjunction with open microsurgical resection.

The direct approach to the planum sphenoidale avoids frontal lobe retraction and allows for early devascularization of the lesion, though the risk of post-operative CSF leak is a limitation.

We present the case of a 60-year-old female. Her presenting symptoms included

- progressively worsening memory
- personality changes
- loss of smell

She was found to have a large anterior skull base meningioma involving the planum sphenoidale and tuberculum abutting the prechiasmatic optic nerves. In addition to T2 FLAIR hyperintensity from vasogenic edema in bilateral frontal lobes, there were significant bony remodeling changes consistent with pneumosinus dilataans of the sphenoid sinus and hyperostosis of the anterior skull base (Figure 1). The tumor extended laterally beyond the bilateral optic canals and over the orbital roof, precluding complete resection from EEA. A two-staged operation was planned for resection.

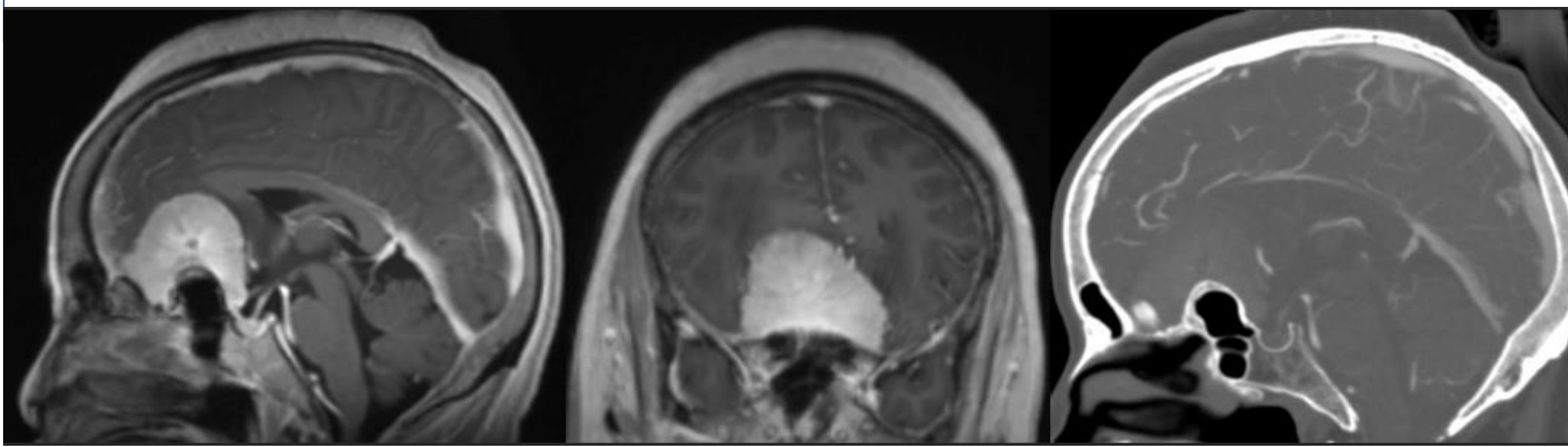


Figure 1: Sagittal/coronal MRI, sagittal CTA showing large anterior skull base meningioma with hyperostosis and bony remodeling of planum sphenoidale

## Methods and Materials

### Surgical Approach

- A lumbar drain was placed to decrease the risk of post-operative CSF leak and bolster the anterior cranial fossa repair.
- A standard EEA was pursued to reach the anterior skull base. A high-speed drill was used to remove the hyperostotic bone at the planum sphenoidale.
- After opening the dura from the olfactory groove to the tuberculum, the inferior aspect of the tumor was identified.
- Tumor was directly lifted away from the prechiasmatic optic nerves bilaterally. The edges of the tumor were noted to be significantly adherent to the pia.

At this point, the goals of the first stage were met and we proceeded to the skull base repair using a dural matrix onlay, nasal septal cartilage, fascia lata graft, and nasoseptal flap.

### Post-Operative Care and Imaging

- The patient was awakened from anesthesia without complication in stable condition.
- Non-contrast CT showed resection of hyperostotic bone spurs.
- Post-operative MRI was notable for decompression of the prechiasmatic optic nerves and dramatic reduction in contrast-enhancement throughout the lesion consistent with devascularization (Figure 2).
- The patient was discharged POD5 to return for microsurgical resection after a month.

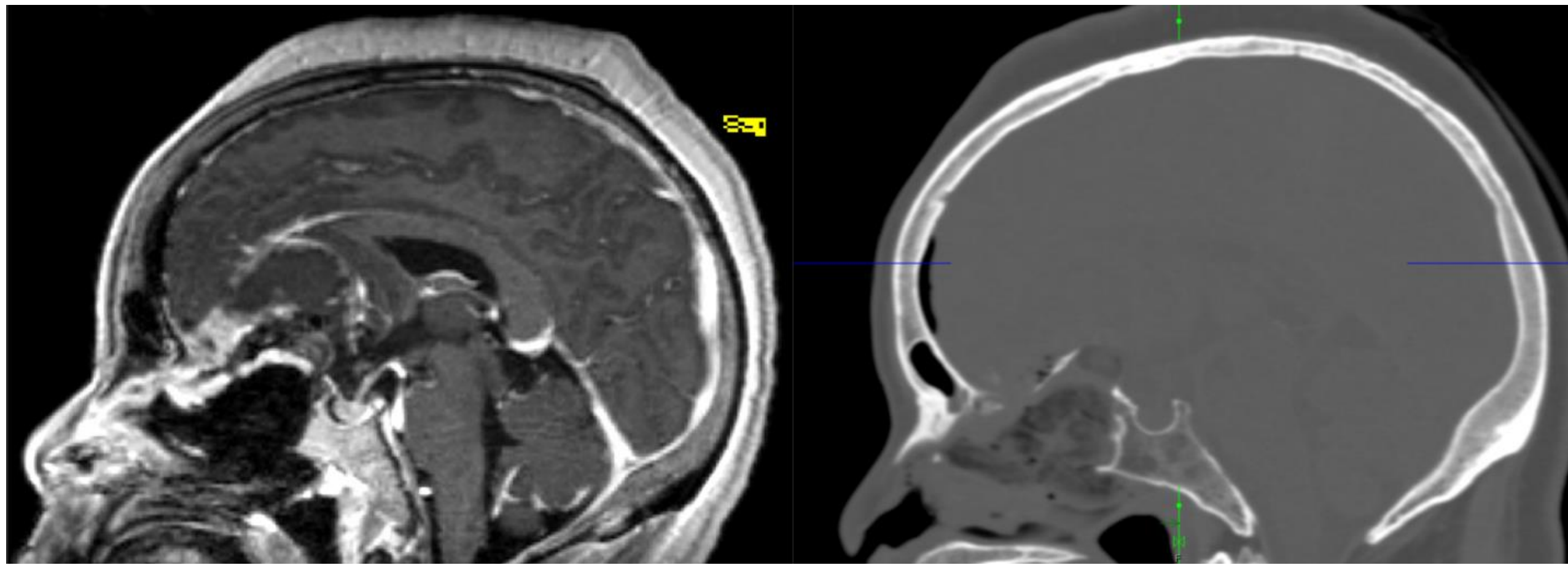


Figure 2: Loss of central contrast-enhancement and resection of hyperostotic bone spurs immediately after EEA.

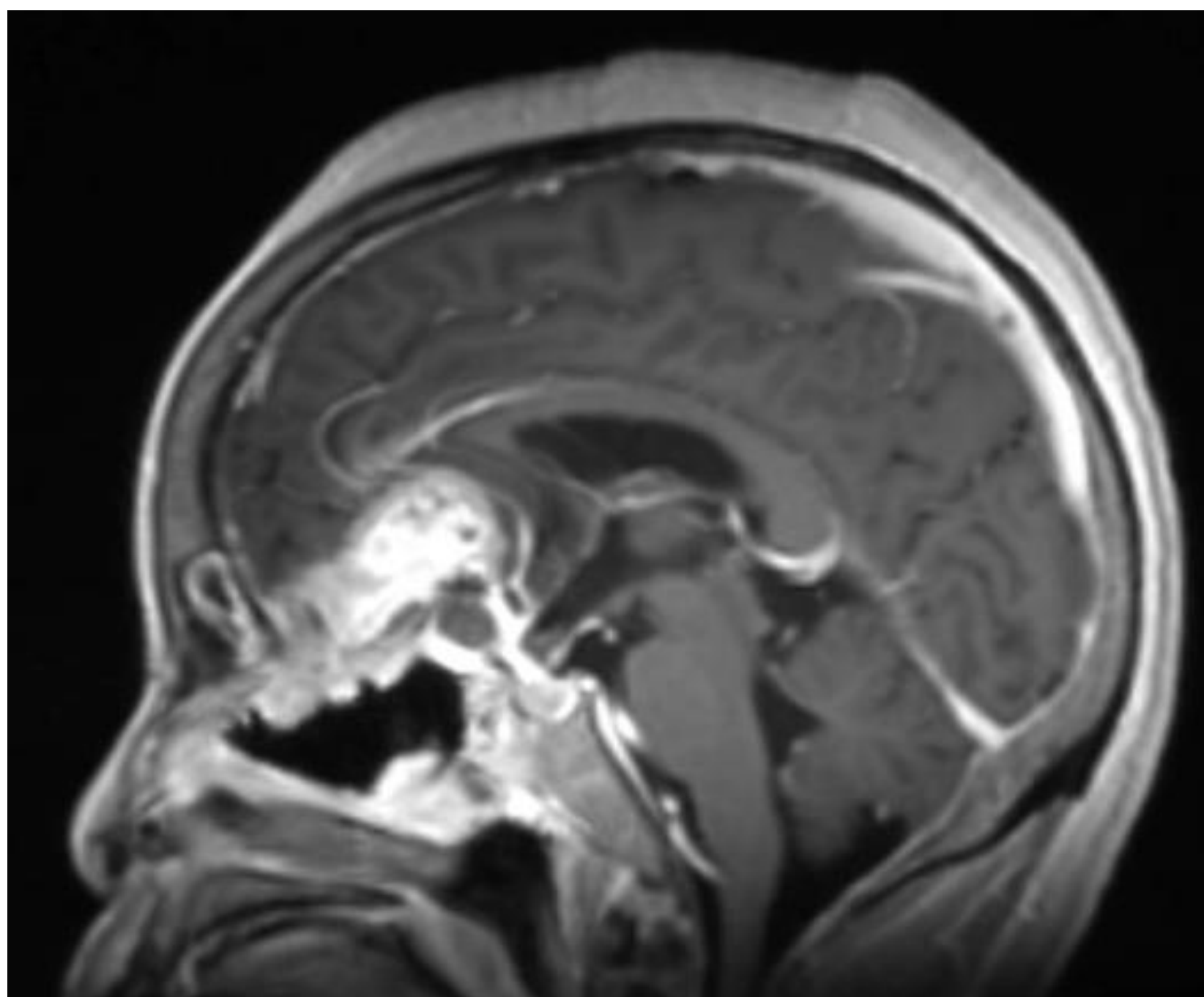


Figure 3: Partial return of contrast-enhancement prior to surgical resection

## Results

Repeat MRI was obtained for pre-operative planning, with partial return of central and peripheral contrast-enhancement (Figure 3). Standard bifrontal craniotomy was performed for resection of the lesion. Intraoperatively, the tumor was noted to be devascularized and quantitative blood loss per nursing protocol was 70ml for the entire surgery. Post-operative MRI revealed gross-total-resection (Figure 4). The patient woke up from surgery in stable condition without any complication and was discharged on POD2.

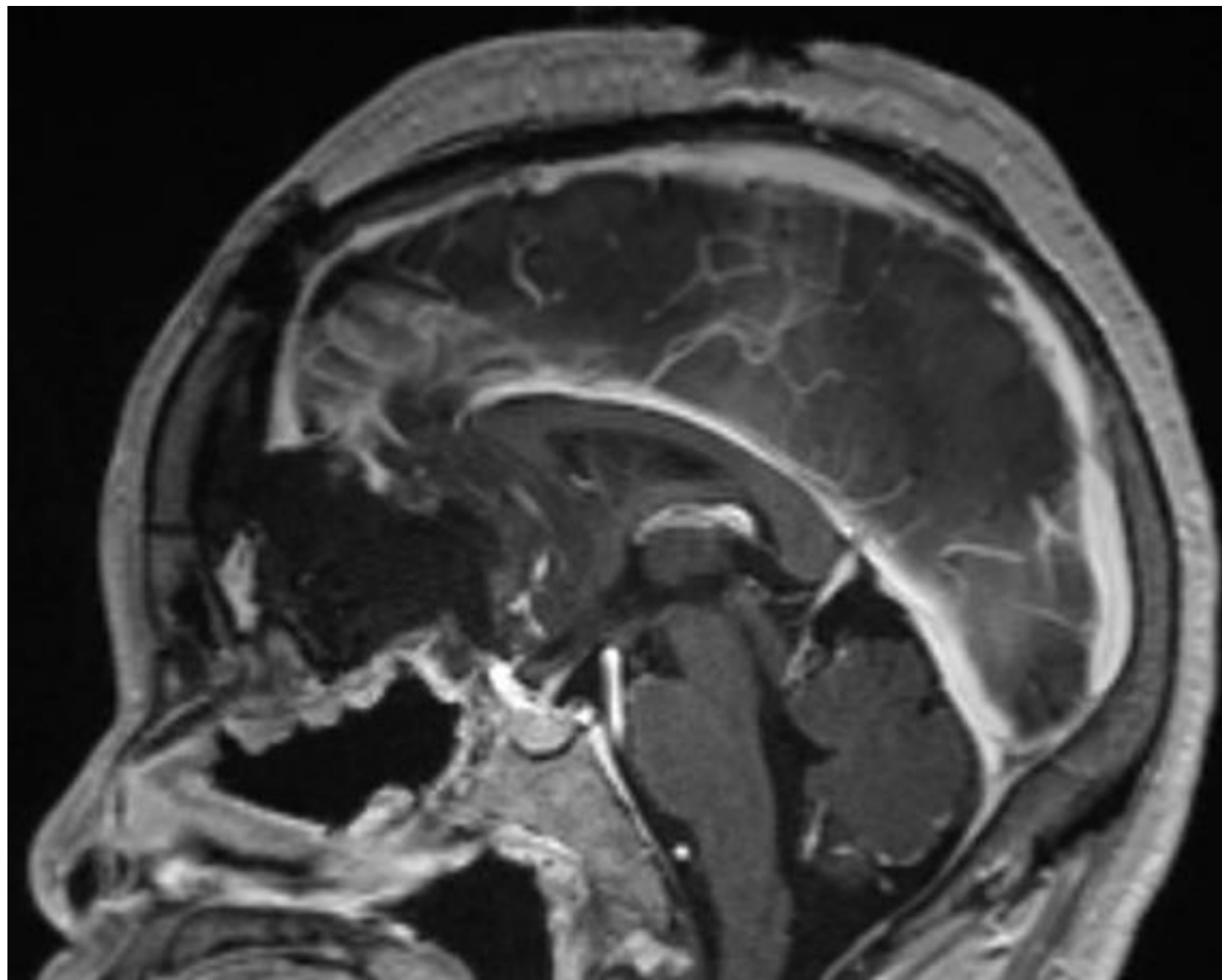


Figure 4: Gross-total-resection after open surgery

## Conclusions

EEA as the first stage of a two-stage resection for large anterior skull base meningiomas allows for removal of prominent hyperostotic bony ridges, direct decompression of the optic apparatus, and devascularization of the tumor.

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