

Modern Surgical Approaches to Tuberculum Sellae Meningiomas

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Patients with tuberculum sellae meningiomas (TSM) often present with subtle, progressive visual deterioration. These tumors expand the suprasellar space displacing the optic nerves and chiasm; optic canal extension is frequent. TSM typically demonstrate homogenous contrast enhancement, normal sellar dimensions, and dural tails on MRI differentiating them from pituitary adenomas.

Conventional pterional, bifrontal, or orbito-zygomatic craniotomy requires frontal and temporal lobe retraction, extensive subarachnoid dissection, and facial disassembly. Modern techniques can resolve these shortcomings. The **endoscopic endonasal approach (EEA)** provides a transnasal corridor obviating brain retraction, neural manipulation, and facial osteotomies. Alternatively, the **focused orbito-zygomatic keyhole craniotomy (FOZA)** with extradural dissection, a technique developed at the Skull Base Center, provides direct extradural access to the tumor minimizing brain and optic nerve manipulation. The position of the optic nerve defines the appropriate approach.

This report describes two cases that illustrate our modern approach to the treatment of TSM at the Skull Base Center at Baylor University Medical Center at Dallas.

Patient 1:

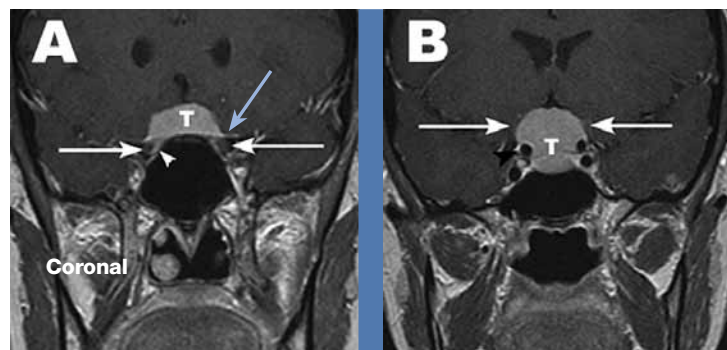
A 41 year-old woman presented with a 1-year history of visual deterioration and a bitemporal visual field deficit. MRI (*Figure 1*) revealed a sellar and suprasellar mass that enhanced homogenously. The 2.6 cm tumor displaced the infundibulum dorsally and the optic nerve laterally, and extended along a hyperostotic planum sphenoidale.

Because the TSM was *medial* to the optic nerves, the patient underwent an EEA. Complete tumor excision (Simpson Grade I) was achieved without optic nerve or brain traction. A vascularized nasoseptal flap reconstructed the skull base. The patient was discharged on POD#6 and pathology revealed a WHO Grade I meningioma. The patient had total visual recovery and normal hormonal function. At 1-year follow-up, there was no evidence of recurrent disease (*Figure 2*).

Patient 2:

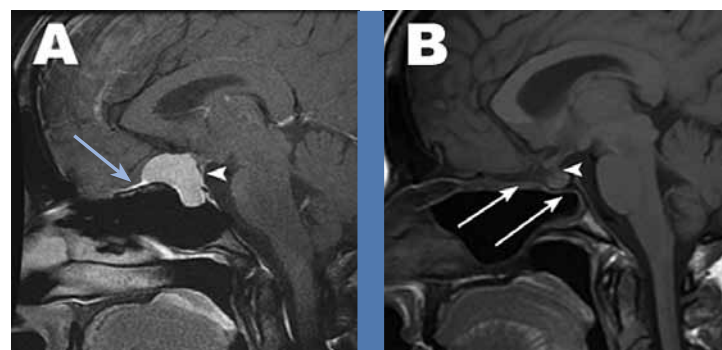
A 53 year-old woman presented with similar visual field deficits and headache. MRI again revealed a 2.5 cm enhancing sellar/suprasellar mass. However, this tumor extended *lateral* to the right optic canal (*Figure 3*), and would be difficult to remove endonasally without undue nerve traction.

Figure 1



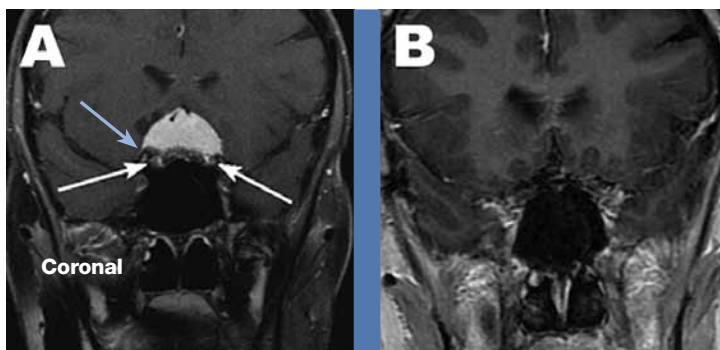
Coronal contrast-enhanced MRI anterior (A) and more posterior (B). The optic nerves (white arrow) are seen lateral to the tumor (T) throughout their course. Note the dural tail (blue arrow), optic canal extension (white arrowhead), and intimate relationship to cavernous carotid (black arrowhead) typical of TSM.

Figure 2



(A) Preoperative MRI shows expansile, homogenously enhancing tumor with dural tail (blue arrow) that displaces the infundibulum dorsally (white arrowhead). (B) One year after EEA, MRI shows a normal infundibulum (white arrowhead) and the outline of a well-healed vascularized flap (white arrows).

Figure 3



(A) Preoperative MRI shows tumor and dural tail (blue arrow) extending lateral to the optic canal (white arrow). (B) 15-month postoperative MRI shows no recurrent tumor and normal brain signal.

Therefore, a right FOZA was performed. The optic canal and tumor were approached extradurally. The optic canal was opened and the nerve was decompressed. While avoiding any traction on the nerve, the tumor was then debulked, detached from its dural base, and completely resected (Simpson Grade I). The patient was discharged on POD #3. Pathology showed a WHO Grade I meningioma. The patient fully recovered her vision and has no evidence of disease at 15-months.

In conclusion, EEA and FOZA allow for complete resection of TSM. An individual's anatomy determines the approach with the least neural manipulation. Surgeons facile with these techniques can offer minimal-access procedures to patients with TSM.

Skull Base Center Clinical Case Report



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