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Effective Surgical Treatment of Meningiomas of the Ollatory Groove and Sphenoid Bone from the Tuberculum Sella Turcica

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Abstract: Meningiomas of the perisellar region (the colliculus sellae, anterior clinoid process (ACP), lesser and medial parts of the greater wing of the sphenoid bone, and cavernous sinus) account for 20–25% of the total number of intracranial meningiomas [1, 4]. The leading symptom in the clinical course of perisellar meningiomas (PSM) is optic nerve (ON) dysfunction, caused not only by the volumetric effect of the tumor on the ON and chiasm, but also by tumor spread and nerve compression in the optic canal (OC). Cases of ON dysfunction caused by direct tumor spread into the optic canal (OC) deserve special attention. This limits the possibility of radical resection of these tumors and leads to unsatisfactory functional results in the postoperative period. Meningiomas tend to spread into the OC regardless of their size [7]. Leading neurosurgeons consider early extradural decompression of the ON (OD) and its maximum mobilization for tumor manipulation to be a key aspect of surgery for meningiomas extending into the OC. ON compression is eliminated not only by tumor removal in the OC, but also by partial resection of its bony walls without damaging the blood supply sources of the optochiasmal complex [2, 7]. This approach allows for more radical removal of the meningioma and preservation or improvement of ON function. It is not always possible to determine tumor extension into the OC at the surgical planning stage, even with the use of modern neuroimaging techniques (magnetic resonance imaging (MRI) and multislice computed tomography (MSCT)). The OD is an integral stage of surgical intervention, influencing both the radicality of the resection and its functional outcome. Various variants of bone decompression of the OC (BD) are used, in particular, the addition of OD with anterior clinoidectomy (ACE). The optic nerve endoscopy (ODS) is performed transcranially, intra- and extradurally. Surgical procedures involve removing the bony walls of the optic nerve, dissecting the falciform ligament, and, if necessary, the optic nerve sheath. An analysis of modern studies and publications devoted to the surgical treatment of meningiomas with extension into the optic nerve revealed different opinions regarding the appropriateness and method of optic nerve endoscopy. The rate of visual recovery in patients with meningiomas that extend into the optic nerve, depending on the tumor characteristics and initial visual acuity, ranges from 25 to 91% [4, 6].

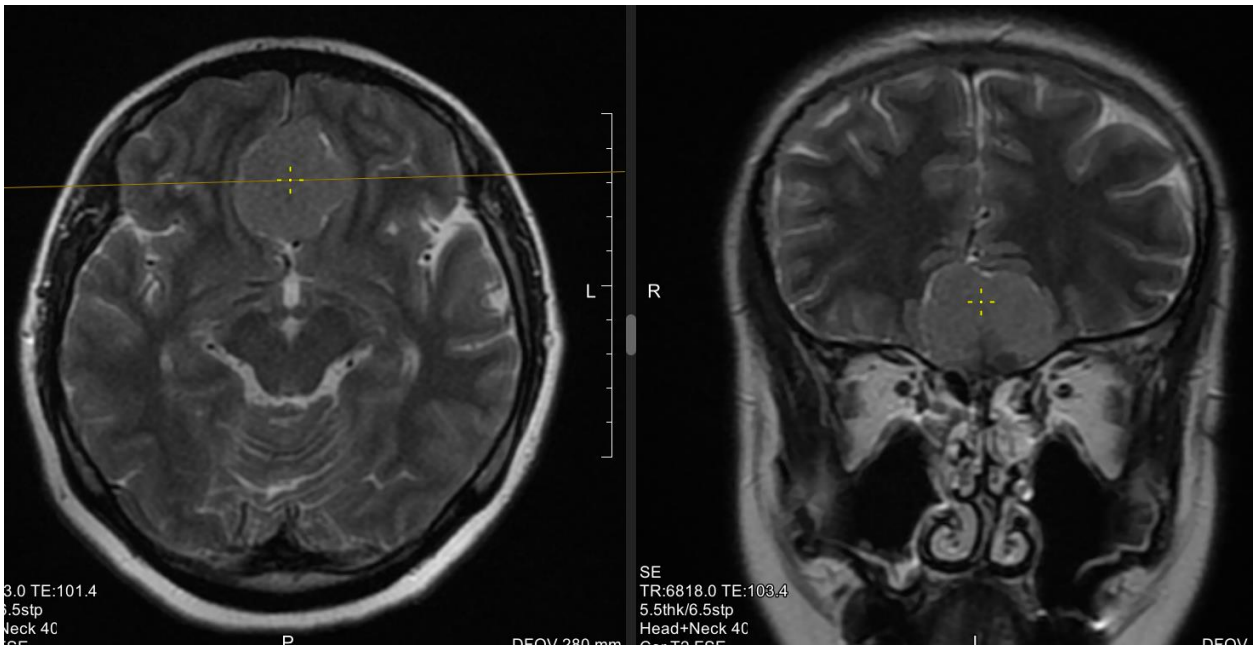
Keywords: tuberculum cella, meningiom, surgery

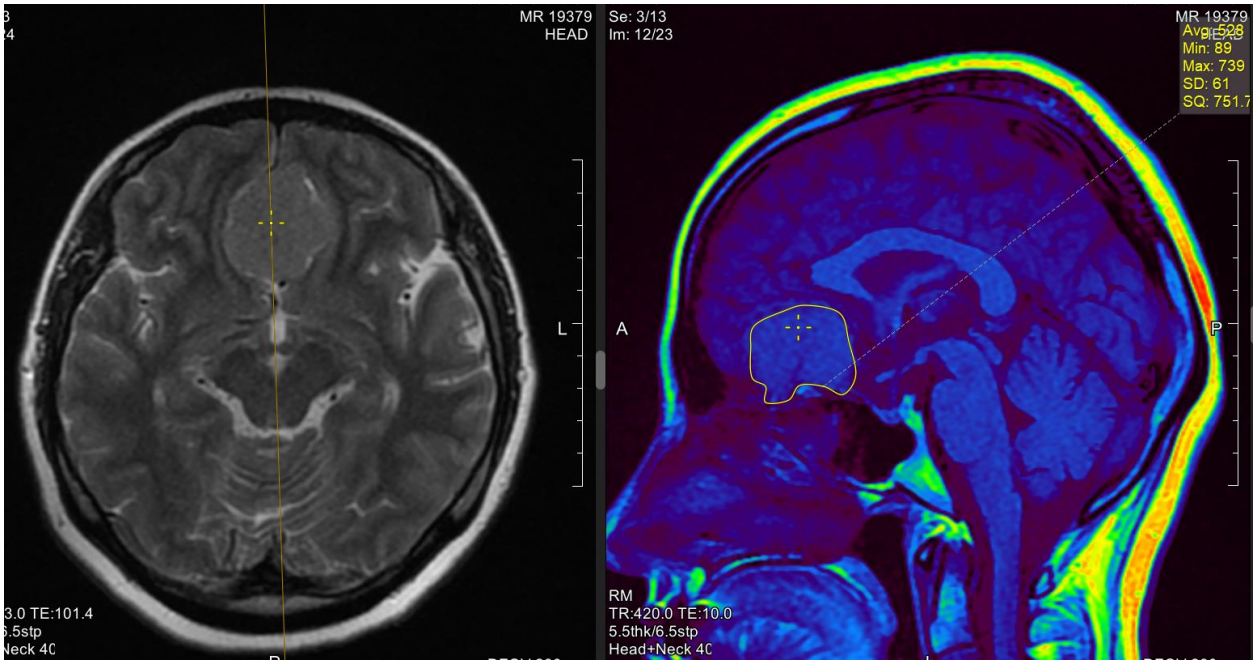
The purpose of the work is to optimize the tactics of surgical treatment of meningiomas of the perisellar localization with spread into the optic nerve canal

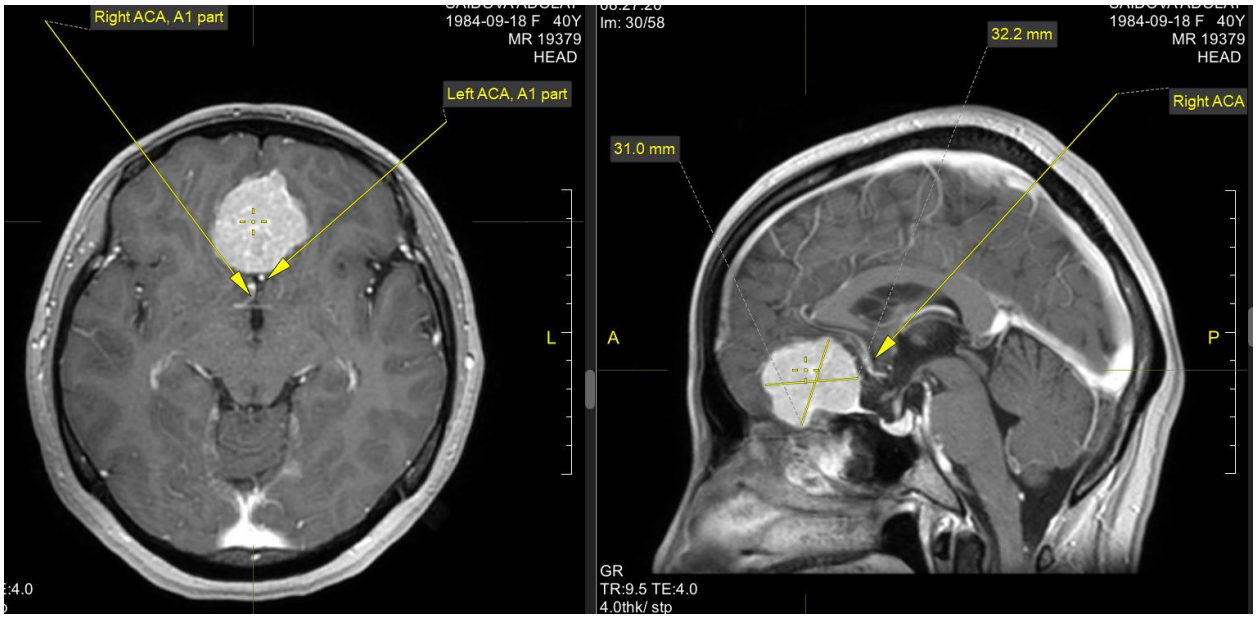
Description of a clinical case. Microsurgical aspects of performing optic nerve disc decompression. ONH canal decompression was preceded by resection of the lateral portions of the greater and lesser wings of the sphenoid bone to the level of the initial portions of the superior orbital fissure. Extradural optic nerve disc decompression was performed before tumor

resection. Then, the dura mater (DM) above the orbital roof and temporal lobe pole was separated, and the orbital roof and lateral portions were resected. The lesser wing and base of the superior orbital fossa were resected. To facilitate mobilization of the superior orbital fossa, the meningo-orbital ligament was dissected. We tried to keep the incision length within 5 mm to prevent damage to the neurovascular structures of the superior orbital fissure. After identification of the optic nerve, we resected its superior and lateral walls (roof and optic strut). In patients of Group 1, the volume of early extradural optic nerve disc decompression was expanded to the maximum possible extent by performing PCE of varying volumes. A 2–3 mm burr with a fine diamond coating was used to perform internal decompression of the TMJ. This step requires meticulous execution and massive irrigation to prevent overheating of the TMJ. The TMJ was separated from the dura mater and removed. When necessary, the lateral wall of the cavernous sinus was exposed using the Hakuba method [3]. Upon admission, the patient complained of headaches, dizziness, visual impairment, nausea, and vomiting. Brain tumor removal was performed as planned. The results are presented below.

Pic. 1. Olfactory groove and planum sphenoidale meningioma (from tuberculum sellae).




MR 19379
HEAD
L
3.0 TE:101.4
Se: 3/13
Im: 12/23
Min: 89
Max: 739
SD: 61
A
P
RM
TR:420.0 TE:10.0
5.5thk/6.5stp
Head+Neck 4C


Right ACA, A1 part
1984-09-18 F 40Y
MR 19379
HEAD
Left ACA, A1 part
L
Im: 30/58
32.2 mm
Right ACA
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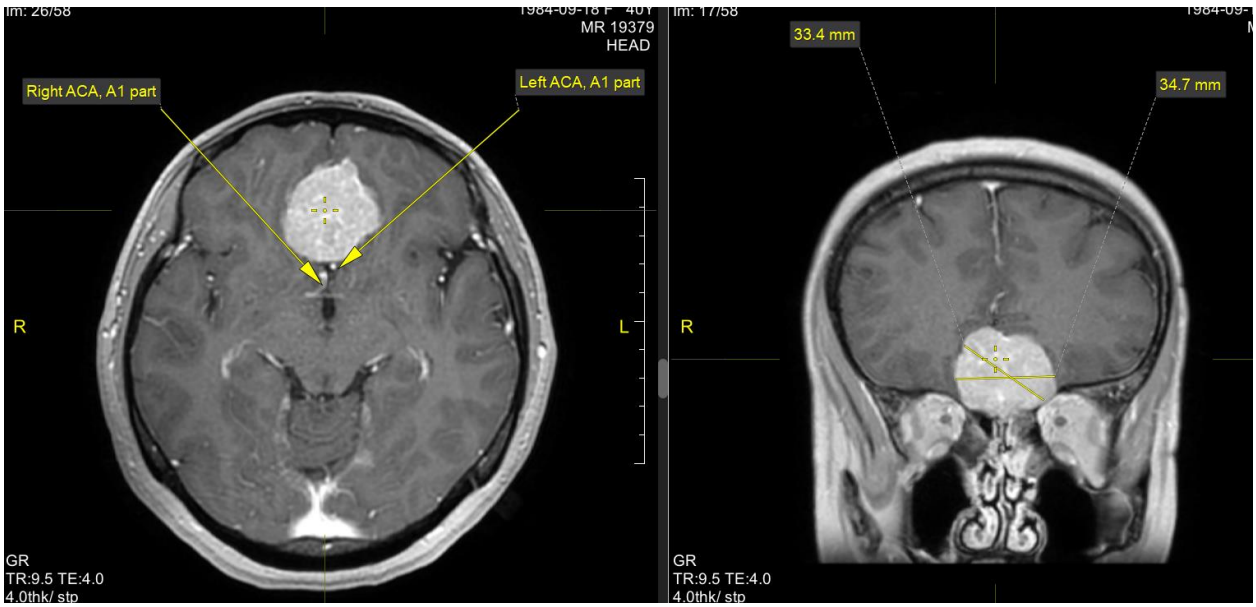
P
GR
TR:9.5 TE:4.0
4.0thk/ stp


MR 19379
HEAD
Right ACA, A1 part
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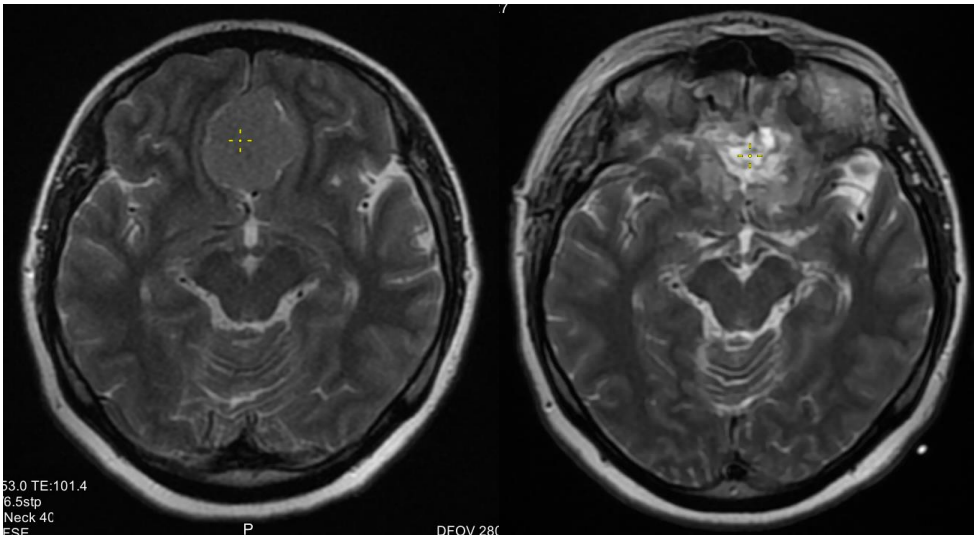
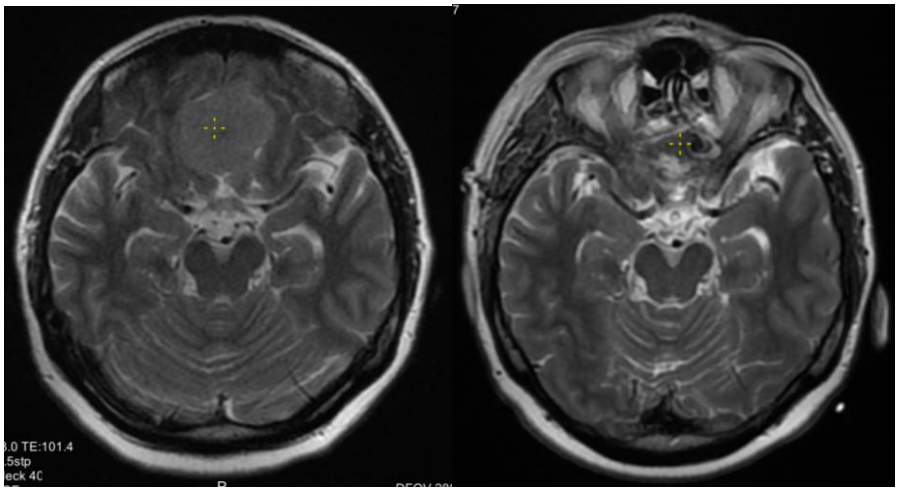
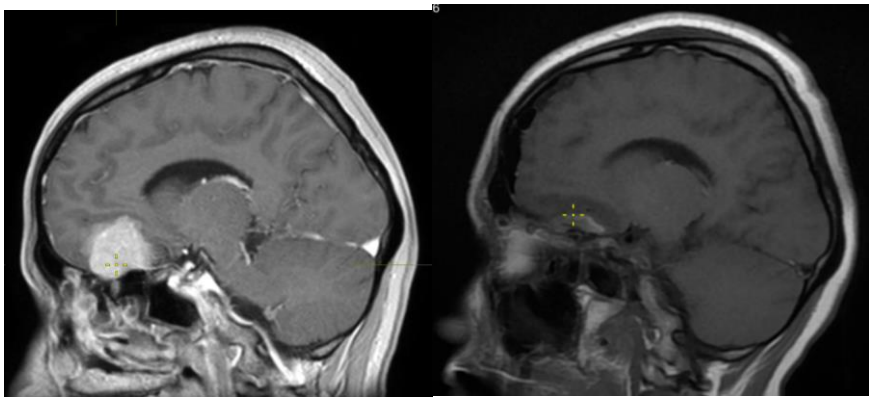
4.0thk/ stp
33.4 mm
34.7 mm



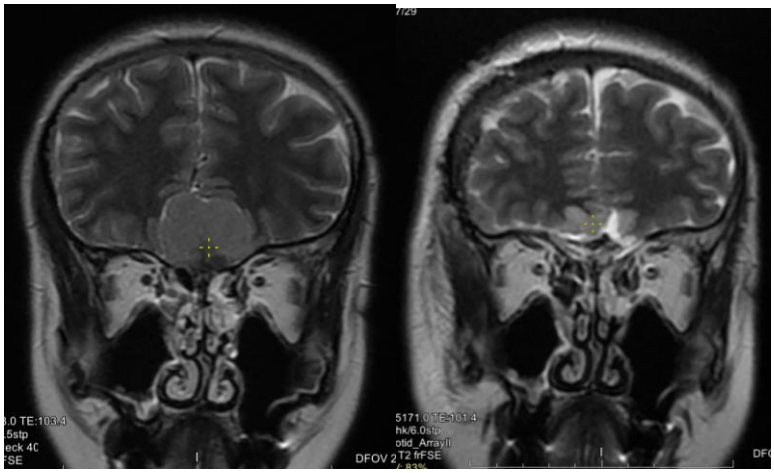
Pre-operation Post-operation



Pre-operation Post-operation



Pre-operation Post-operation



Pre-operation Post-operation

Conclusion. Surgical removal of meningiomas around the sellar region is often complicated by tumor spread into the optic canal. Bone decompression of the optic canal is a necessary and important step in the surgical procedure, ensuring the preservation of optic nerve function and the completeness of the procedure.

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