Orbitozygomatic Approach Indications

- Approaches for the Minimally Invasive Resection of Chiasmatic Cavernous Hemangioma: Analysis of 56 Cases in the Literature
- Anterolateral keyhole transorbital routes to the skull base: a comparative anatomical study
- 1-Piece Versus 2-Piece Fronto-Temporo-Orbito-Zygomatic Craniotomy: A Narrative Overview of Evolution
- Pretemporal Transcavernous Approach to Basilar Tip Aneurysms: Operative Technique and Surgical Nuances: 3-Dimensional Operative Video
- Orbitozygomatic Transsylvian and Subtemporal Transzygomatic Approaches for Clipping of Basilar Tip Aneurysms: 2-Dimensional Operative Video
- You Take the Low Road: Differential Outcomes After Tangential and Transcortical Approaches to Medial Temporal Brain Arteriovenous Malformations
- Minimally invasive craniotomies for lesions of the anterior and middle fossa
- Efficiency and safety of minimally invasive approaches for microsurgical treatment of brain aneurysms

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Pathology in the region of the basilar quadrifurcation, anterolateral midbrain, medial tentorium, and interpeduncular and ambient cisterns may be accessed anteriorly via an orbitozygomatic (OZ) craniotomy.

Although pterional craniotomy and its variants are the most used approaches in neurosurgery, few studies have evaluated their precise indications.

da Silva et al., from the Hospital das Clínicas evaluated the pterional (PT), pretemporal (PreT), and orbitozygomatic (OZ) approaches through quantitative measurements of area, linear, and angular exposures of the major intracranial vascular structures.

Eight fresh, adult cadavers were operated with the PT, followed by the PreT, and ending with the OZ approach. The working area, angular exposure of vascular structures and linear exposure of the basilar artery were measured.

The OZ approach presented a wider area (1301.3 ± 215.9 mm2) with an increase of 456.7 mm2 compared with the PT and of 167.4 mm2 to the PreT (P = 0.011). The extension from PT to PreT and OZ increases linear exposure of the basilar artery. When comparing the PreT and OZ, they founded an increase in the horizontal and vertical angle to the bifurcation of the ipsilateral middle cerebral artery (P = 0.005 and P = 0.032, respectively), horizontal angle to the basilar artery tip (P = 0.02), and horizontal angle to the contralateral ICA bifurcation (P = 0.048).

The OZ approach offered notable surgical advantages compared with the traditional PT and PreT regarding to the area of exposure and linear exposure to basilar artery. Regarding angle of attack, the orbital rim and zygomatic arch removal provided quantitatively wider exposure and increased surgical freedom. A detailed anatomic study for each patient and surgeon experience must be considered for individualized surgical approach indication [1)].

The orbitozygomatic approach provides wide, multidirectional access to the anterior and middle cranial fossae, as well as to the upper third of the posterior fossa and clivus.

The technique eliminates the need for bone reconstruction of the orbital walls to prevent enophthalmos and minimizes the risk of injury to the frontal branch of the facial nerve [2].

The surgical technique of obitozygomatic craniotomy reported by Zabramski, et al. is an excellent procedure, facilitating wide surgical exposure, easy orbital reconstruction, and a satisfactory postsurgical esthetic outcome; however, it is anatomically complicated and technically difficult.

Kodera et al., introduce a simplified technique of Zabramski's orbitozygomatic craniotomy and present the anatomical and clinical findings with cadaveric photos, illustrations, and a video of surgery.

The orbitozygomatic craniotomy was performed on 20 sides of 11 cadaver heads, in which the cut between the inferior orbital fissure (IOF) and superior orbital fissure (SOF) was modified and simplified, and the shortest distance between them was measured. This technique was applied to 13 clinical cases, and craniotomy-associated esthetic and functional complications were evaluated.

The average of the shortest distance from IOF to SOF was 21.3 mm (range, 19 - 23 mm) on the 20 sides of the 11 cadaver heads. Orbitozygomatic craniotomy could be achieved in a short time while preserving the structure of the orbital wall in all 13 clinical cases. A hollow at the temple was noted in one patient, cerebrospinal fluid leak in two, and transient facial pain in one; however, no other craniotomy-associated esthetic or functional complications including enophthalmos were found in any of the 13 patients.

With this modified technique, Zabramski's ideal obitozygomatic craniotomy could be achieved easily with only minimal complications while realizing all advantages of the technique [3].

Pellerin et al. and Hakuba, et al. first described the orbitozygomatic approach (OZ) to the anterior and middle cranial fossae as well as to the upper third of the clivus and posterior fossa. Since then, various authors have reported a variety of modifications to enhance the exposure offered by the orbitozygomatic approach.

Increased bone removal from the skull base obviates the need for vigorous brain retraction and offers an improved multiangled trajectory and shallower operative field. Modifications to the orbitozygomatic approach provide alternatives that can be tailored to particular lesions, enabling the surgeon to use the best technique in each individual case rather than a “one size fits all” approach [4].

1)
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