

Anatomy of the optic canal and its clinical role

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The optic canal is a short funnel-like structure extending from the optic foramen to the orbital apex, where the optic nerve (ON) and the ophthalmic artery (OA) pass through. The relationship between these two structures has been already well reported, in particular in the majority of cases the artery runs within the optic sheath below the ON, which is surrounded by arachnoidal membrane in this part. [1]. However, few anatomical variants have been reported, such as the origin of the OA from the intracavernous tract of the internal carotid artery [1]. In this case, it is possible for the OA not to pass through the optic canal, but in the superior orbital fissure [1]. For its course and for the normal location of the OA it could be difficult to analyze the anatomy of the content of the optic canal from the classic transcranial dissection [2,3]. Therefore, we performed the opening of the ventral surface of the optic canal in 6 cadavers (12 pairs of optic canals), adopting an endonasal route, performed with the auxilium of the endoscopic visualization technology. Our dissections clearly show the relationship between OA and ON in the optic canal. This knowledge is of particular importance for tumors invading the optic canal, such as tubercular sellae meningiomas, which can be safely approached through this endoscopic endonasal route, avoiding the risk of injury of OA within the optic canal [2,3]

References

- [1] Martins C, Costa E Silva IE, Campero A, Yasuda A, Aguiar LR, Tatagiba M, Rhoton A Jr. Microsurgical anatomy of the orbit: the rule of seven. *Anat Res Int.* 2011;2011:468727
- [2] Koutourousiou M, Fernandez-Miranda JC, Stefkó ST, Wang EW, Snyderman CH, Gardner PA. Endoscopic endonasal surgery for suprasellar meningiomas: experience with 75 patients. *J Neurosurg.* 2014 Jun;120(6):1326-39
- [3] Liu JK, Christiano LD, Patel SK, Tubbs RS, Eloy JA. Surgical nuances for removal of tuberculum sellae meningiomas with optic canal involvement using the endoscopic endonasal extended transphenoidal transplanum transtuberculum approach. *Neurosurg Focus.* 2011 May;30(5):E2.

Keywords

Optic nerve; Ophthalmic artery; Optic Canal; Tuberculum sellae meningiomas.