

Interoptic triangle

The interoptic triangle (IOT) offers a key access to the contralateral [carotid ophthalmic segment](#) (oICA) and its perforating branches (PB), the [ophthalmic artery](#) (OA), and the [superior hypophyseal artery](#) (SHA). It has been previously reported that the assessment of IOT's size is relevant when attempting approaches to the contralateral oICA. However, previous studies have overseen that, since the oICA is a paramedian structure and a lateralized contralateral approach trajectory is then required, the real access to the oICA is further limited by the approach angle adopted by the surgeon with respect to the IOT's plane. For this reason, Serrano et al., determined the surgical accessibility to the contralateral oICA and its branches through the IOT by characterizing the morphometry of this triangle relative to the optimal contralateral approach angle.

They defined the “relative interoptic triangle” (rIOT) as the two-dimensional projection of the IOT to the surgeon's view, when the [microscope](#) has been positioned with a certain angle with respect to the midline to allow the maximal contralateral oICA visualization. They correlated the surface of the rIOT to the visualization of oICA, OA, SHA, and PBs on 8 [cadavers](#) and 10 clinical datasets, using for the last a 3D-virtual reality system.

A larger rIOT correlated positively with the exposure of the contralateral oICA ($R = 0.967$, $p < 0.001$), OA ($R = 0.92$, $p < 0.001$), SHA ($R = 0.917$, $p < 0.001$), and the number of perforant vessels of the oICA visible ($R = 0.862$, $p < 0.001$). The exposed length of oICA, OA, SHA, and number PB observed increased as rIOT's surface enlarged. The correlation patterns observed by virtual 3D-planning matched the anatomical findings closely.

The exposure of contralateral oICA, OA, SHA, and PB directly correlates to rIOT's surface. Therefore, preoperative assessment of rIOT's surface is helpful when considering contralateral approaches to the oICA. A virtual 3D planning tool greatly facilitates this assessment ¹⁾.

¹⁾

Serrano LE, Archavlis E, Ayyad A, Nimer A, Schwandt E, Ringel F, Kantelhardt SR. The approach angle to the interoptic triangle limits surgical workspace when targeting the contralateral internal carotid artery. *Acta Neurochir (Wien)*. 2019 Aug;161(8):1535-1543. doi: 10.1007/s00701-019-03911-7. Epub 2019 May 18. PubMed PMID: 31104123.

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