

# Inter and intra-procedural hemodynamic variations in the orbit of children affected by intraocular retinoblastoma and treated with intraarterial chemotherapy

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It is always assumed that in the absence of vascular disease the blood within the ophthalmic artery flows from the orbital apex towards the anterior orbital opening. As a corollary, the flow should be directed from proximal to distal also in the ramifications of the ophthalmic artery. We report a study that we carried out on 99 children affected by intraocular retinoblastoma who underwent several sessions of intra-arterial chemotherapy and that unveiled some unexpected findings [1]. As in some cases the disease was bilateral the treated orbits were 108. In all orbits the ophthalmic artery was constantly present though not always visible by selective angiography of the internal carotid artery. The blood flow within the ophthalmic artery, in fact, did not always flow anterogradely. The orbits could be entirely supplied either by the internal carotid artery or by the external carotid artery. Between these two extreme situations (internal carotid artery or external carotid artery dominance), a variety of possible hemodynamically intermediate conditions (balanced hemodynamic) could be found with part of the orbit supplied by branches of the external carotid artery and part from the internal carotid artery. These three possibilities were not always stable conditions. When a series of angiographies was carried out monthly on the same child it was not unusual to find different hemodynamic outlines. It is evident that the extension of the territories supplied by the external carotid artery and internal carotid artery could change in a matter of days at least in children. These findings unveil that in children a subtle balance exists between external carotid artery and internal carotid artery, the two vessels competing for the orbital blood supply.

## References

- [1] Bertelli et al. (2016) Hemodynamic and anatomic variations require an adaptable approach during intra-arterial chemotherapy for intraocular retinoblastoma: alternative routes, strategies and follow-up. *AJNR Am J Neuroradiol* doi:10.3174/ajnr.A4741.

## Keywords

Ophthalmic artery; orbit; hemodynamic variations; external carotid artery; internal carotid artery; retinoblastoma; intraarterial chemotherapy.