Morphometric Analysis of the Inferior Ophthalmic Vein and its Clinical Aspects

Author: Amil Duddha, Shelby Kuhnert, Kathrine Spear
Faculty Mentor: Dr. Farida Mehrhoff, Dr. Alla Barry
Department: Biology and Environmental Health
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Introduction

The inferior ophthalmic vein (IOV) is one of the veins draining the orbit, including the eye (1, 2, 3). In addition to the well-known superior ophthalmic vein (SOV), it is used to approach the cavernous sinus during neurosurgery (4).

Materials and Methods

1. Twelve formalin-preserved human cadavers (mean age 78.8 ± 14 years) without risk factors for IOV dilation were selected. Face and brain vessels were examined on subject of absence of vascular malformation:

- Anterior Cerebral artery
- Middle aspect
- Posterior Cerebral artery

2. Twenty-one orbits were dissected. Orbital roof was removed to expose and measure IOVs. The veins were photographed:

- Superior view of orbit

3. IOVs were removed, the length, diameter, and branching pattern were documented.

Results/Discussions

Four main patterns of the IOV were observed:

- Small veins join into 2 branches which, in turn, form 1 main branch exiting via superior orbital fissure (a)
- Branches join at one point (fan-like structure) and empty into the SOV or exit through the superior orbital fissure (b)
- Very thin branches form one main branch at the exit point entering the inferior orbital fissure (c)
- Branches form elaborate interconnections exiting through the inferior orbital fissure (d)

• The findings of our study suggest that the thickness of the IOV walls remains relatively constant in veins with diameters from 0.4 mm to 2.6 mm. Starting from 2.7 mm diameter, veins’ walls tend to get thinner.

Conclusions

• The obtained cadaver images on the course and branching pattern of the IOV could help access the vein during neurosurgery that uses it as an approach into the deep brain structures.
• Data on the diameter of the IOV contributes to better understanding the pathogenesis of the orbital veins’ dilation. Reduction in the wall thickness in veins wider than 2.7 mm increases the risk of rupture; and avoiding the use of this vein as a surgical approach could be considered.

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References


