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Combined presence of ophthalmic artery origin from anterior cerebral artery and meningolacrimal artery

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In this study we describe a case of an ophthalmic artery (OphA) originating from the pre-communicating segment of the anterior cerebral artery (A1), associated with the presence of a meningolacrimal artery (MLA). The OphA has an anomalous origin in 1-3% of cases and rarely arises from A1, however, the combination of these anatomical variations is unique. Anomalous origins of the OphA are also correlated with a higher incidence of ICA aneurysm (1). Macroscopic and endonasal endoscopic dissections of a cadaver head, which formerly underwent a cone-beam CT scan, were performed. Bilateral samples of the ICA walls were collected and processed for standard hematoxylin-eosin staining and immunofluorescence analysis. The MLA was found on the right side by CT scan and its entrance in the superior orbital fissure was confirmed during head dissection. Hence, performing the endoscopic approach on the same side, the anomalous OphA, originating from the inferior surface of A1 segment and entering the optic canal above the optic nerve, was discovered. This arterial pattern could be explained by the embryological development of the orbital vascular system and it is referred to persistent ventral OphA (2). The histomorphological examination of ICA walls showed a significantly decreased thickness of the tunica media and adventitia on the right side compared to the left one. In addition, fluorescence microscopy showed that type I and type III collagen were significantly lower in the tunicae media and adventitia of the right side. Since aneurysms of the ICA are related with a low content of collagen in the arterial wall, our results are consistent with current literature.

References

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Keywords

Ophthalmic artery; meningolacrimal artery; cadaver dissection; endoscopy; anatomical variations.