

An Abnormal Origin of the Ophtalmic Artery

A Case Report

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An abnormal artery arising from the middle meningeal artery is of sufficiently rare occurrence to warrant a short note.

Harvey, Howard and Hayreh(4,5,7) illustrated an anatomic dissection in which the ophthalmic artery originated from the anterior branch of the middle meningeal artery, passed through the superior orbital fissure, and then

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assumed a normal course. These authors stressed that in these instances the central retinal usually originates from the interal carotid artery, even though the rest of the ophthalmic system arises from the middle meningeal artery.

Case Report

In a male body, aged 52, the ophthalmic artery on the left side arose from the anterior division of the middle meningeal. It gave off a lacrimal branch before entering the orbit through the extreme outer end of the sphenoidal fissure. Within the orbit it passed deep to the ophthalmic vein and superior rectus muscle, to which it gave a branch, and then crossed, superior to the optic nerve, to the inner wall of the orbit. It then proceeded forwards between the internal rectus and superior oblique muscles giving off the anterior and posterior ethmoidal arteries. It finally terminated by dividing into the frontal and nasal arteries.

The nasal, branch, after emerging from the internal tarsal ligament, took the place of the supra-orbital and anastomosed with the frontal and a branch from the superficial temporal. The supra-orbital artery itself was wanting.

The central artery of the retina and the ciliary arteries were given off from the internal carotid.

In addition to the abnormal ophthalmic the middle meningeal gave off its normal petrosal branch directly opposite to the abnormal vessel. This took the normal course backwards into the aqueduct of Fallopius wherein it was found to anastomose with a vessel which proved

on dissection to be the stylo-mastoid branch of the posterior auricular artery from the external carotid. No artery passed through the hollow of the stapes.

DISCUSSION

An abnormal ophthalmic artery from the middle meningeal is best explained as a persistence of the embryonic condition. In other words, failure of fetal development or atrophy of the initial portion of the ophthalmic artery is the logical explanation of this anomaly. Embryologically the hyoid artery (a branch of the internal carotid artery) gives rise to the stapedial artery which in turn gives origin to the middle meningeal artery and then continues into the orbit as a supraorbital branch. Normally, the attachment of the stapedial artery to the internal carotid system undergoes atrophy, and the stapedial artery system then becomes connected to the external carotid system. The middle meningeal artery then becomes a major branch of the external carotid system with the supraorbital artery a minor branch of the anterior division of the middle meningeal artery. If the proximal connection of the ophthalmic artery to the internal carotid atrophies or fails to develop, however, then the supraorbital branch of the middle meningeal artery may become the primary blood supply for the orbit (2,4,6).

With occlusive disease of the internal carotid artery proximal to the ophthalmic artery, the ophthalmic often provides considerable collateral circulation to the brain from the external carotid artery via the orbit (8). As

much as 20 per cent of the intracranial flow may occur via collateral branches through the orbit when both internal carotid arteries are occluded in the neck (1,3).

SUMMARY

1. An instance of an abnormal artery arising from the middle meningeal is described.
2. The embryologic and possible clinical significances of this anomaly are discussed.

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