Anomalous Origin of the Posterior Inferior Cerebellar Artery from the Posterior Meningeal Artery

The posterior inferior cerebellar artery (PICA) usually originates from the distal vertebral artery. Many variations in its origin and course have been observed in association with anomalies of the anterior inferior cerebellar artery (AICA) [1]. However, as far as we know, angiographic evidence of anomalous origin of the PICA from the posterior meningeal artery (PMA) has not been reported previously. This last anomaly is interesting with regard to the embryologic development of the PICA and the PMA.

Case Report

The patient was a 42-year-old man who had a subarachnoid hemorrhage. Bilateral internal carotid angiograms showed a saccular aneurysm at the anterior communicating artery. A right vertebral angiogram showed an anomalous branch of the PMA arising from the third segment of the vertebral artery (Fig. 1). The course of the anomalous branch corresponded to the tonsillohemispheric branch of the PICA. At the distal portion of the vertebral artery beyond the origin of the PMA, another branch of the PICA supplied the medulla.

Discussion

According to Padget [2], when the embryo is about 18 mm long, the stems of the AICA and the PICA become recognizable among the numerous basilar and vertebral branches supplying the posterior part of the hindbrain. However, before the embryo becomes 40 mm long, those basilar and vertebral branches often are connected by longitudinal remnants of a prominent lateral channel (the primitive lateral basivertebral anastomosis). The chief explanation for the variable origins of the AICA and the PICA is late retention of the different remnants of the primitive lateral basivertebral anastomosis.

Tanohata et al. [3] reported two cases of anomalous origin of the PMA from the lateral medullary segment of the PICA. Their explanation for this anomalous origin was persistence of one of the preexisting anastomotic channels between the primitive vessels of the future PICA and the future PMA, as can be understood easily from the results of Padget’s observations. Our case showed a reversal of the branching pattern seen by Tanohata et al. However, the anomalous origin of the PICA from the PMA also might be caused by the persistence of one of the preexisting anastomotic channels between the primitive vessels of the future PICA and the future PMA, with regression of the proximal portion of the PICA.

The PMA usually arises from the third segment of the vertebral artery and supplies a portion of the dura of the posterior fossa. It also supplies branches to lesions of the posterior fossa, such as meningioma, hemangioblastoma, and arteriovenous malformation. Knowledge of whether the PMA supplies branches to the medulla or the cerebellum is important in surgical management and interventional angiography of these lesions. Planning appropriate treatment requires detailed angiographic evaluation of the PMA.

REFERENCES

2. Padget DH. The development of the cranial arteries in the human embryo. Contrib Embryol 1948;32:207–262

Fig. 1.—A and B, Frontal (A) and lateral (B) views of right vertebral angiogram show two right posterior inferior cerebellar arteries. One (single arrows) arises from distal right vertebral artery and supplies branches to the medulla. The other arises from the posterior meningeal artery (double arrows) and supplies mainly branches to the territory of the tonsillohemispheric branch (arrowheads), which supplies the inferior portion of fourth ventricle, the inferior surface of cerebellar hemisphere, and the tonsils.