What’s the story morning glory? A review of morning glory disc anomaly and associated findings.

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Disclosures

No Disclosures.

Purpose

To familiarize the participant with morning glory disc anomaly (MGDA), the imaging appearance, and associated imaging findings to look for.

Approach/Methods

Review of MGDA including fundusoscopic findings, imaging appearance, and associated malformations.

Findings/Discussion

MGDA is a congenital malformation with characteristic findings on fundoscopic exam including a funnel-shaped excavation into the optic disc/optic nerve with surrounding peripapillary chorioretinal pigmentary changes, abnormal peripherally emanating vessels, and a central glial tuft. This unusual fundoscopic appearance was likened to that of the morning glory flower, and so named.

While the diagnosis of MGDA is often made clinically, imaging features can be helpful in unusual clinical presentations as well as in patients with limited direct fundoscopic visualization, such as those with persistent hyperplastic primary vitreous.

Typical MR image findings include excavation of the optic nerve head with elevation of the adjacent retina resulting in a so called “funnel-shape” morphology, abnormal tissue and signal of the intraorbital segment of the optic nerve, and a discontinuous uveoscleral coat.

MGDA has been associated with a number of intracranial abnormalities, many of which are readily identifiable by cross sectional imaging.

Associated vascular abnormalities include absence or hypoplasia of intracranial arteries and in some cases progressive Moyamoya vasculopathy.

A range of associated midline facial and cranial malformations can be seen including cephaloceles, ocular abnormalities such as persistent hyperplastic primary vitreous, congenital cataracts, nanophthalmos, retinal detachment, atrophy of the optic nerve and chiasm, and optic nerve glioma.

There is some suggestion that MGDA may be found within PHACE Syndrome; however, MGDA is less commonly familial or syndrome related than coloboma.

Case One

Axial post contrast T1 with fat saturation and axial T2 with fat saturation MR images from patient with right morning glory disc anomaly. Images demonstrate the typical MRI appearance of optic disc excavation as well as abnormal tissue resulting in effacement of the regional subarachnoid space.

Note the relative absence of the right internal carotid artery flow voids. Time of Flight MRA (bottom), readily demonstrates the hypoplastic right internal carotid artery with distal reconstitution of flow through the circle of Willis.

Case Two

Axial T1 and T2 with fat saturation MR images taken from another patient with morning glory disc anomaly demonstrate a large excavation of the right optic disc/nerve. In comparison to case one, 3D MRA reveals that intracranial vasculature is preserved.

Case Three

Axial post contrast T1 with fat saturation and axial T2 MR images demonstrate a more subtle case of morning glory disc anomaly. There is mild excavation at the right optic disc.

Summary/Conclusion

Morning glory disc anomaly is a congenital malformation centered at the optic disc/nerve with a specific appearance on fundoscopic exam and corresponding imaging findings. Once diagnosed a search should be made for a number of associated midline facial and intracranial vascular malformations.

Neuroradiologists and trainees should be familiar with this entity and associated malformations to look for on MRI/MRA.

References