Idiopathic herniation of gyrus rectus – a rare cause of sudden monocular vision loss

A 24-year-old male patient with a history of sudden, painless loss of vision in his right eye with no history of trauma or any history suggestive of raised intracranial tension. On ophthalmological examination, the patient could only count fingers up to a distance of 2 metres with his right eye while the left eye had a 6/6 vision. The rest of the examination was unremarkable.

Imaging Findings:

High resolution brain and orbit MRI revealed T2 and STIR hyperintensity in the intracanalicular and intracranial part of the right optic nerve. The intra-orbital and retro-chiasmatic portions of the nerve were normal. A low-lying right inferior gyrus rectus was noted, compressing the right optic nerve as seen in figure 1 and 2. The optic nerve was hyperintense due to compression by the herniating right gyrus rectus (Fig. 3). The contralateral optic nerve was normal in signal intensity and calibre with a clear CSF space between the nerve and the left gyrus rectus (Fig. 4). The rest of the brain parenchyma was unremarkable. A working diagnosis of optic neuropathy due to idiopathic herniation of gyrus rectus was made and the patient was started on pulse dose of methylprednisolone which was gradually tapered. The patient showed considerable improvement in vision on follow up.

Discussion:

BACKGROUND

The inferior gyrus rectus is located at the anterior cranial fossa floor superior to the intracranial optic nerves and chiasm. Any mass or dysplastic growth in this region can compress the optic nerve resulting in visual disturbances. Walsh et al [1] first described herniation of gyrus rectus as a possible cause of optic neuropathy but did not confirm the clinical features with radiological studies. Klingele et al [2] and Sharma et al [3] reported cases of mass lesions in the frontal lobe causing herniation of the gyrus rectus into the suprasellar cistern with resultant compression of the optic chiasma. Nishioka et al. [4] defined “compression” by the gyrus rectus as identifiable by MRI features showing that the optic nerve is in contact with the gyrus rectus and the contour is distorted along the gyrus in cases with no identifiable cause of optic neuropathy. They studied 69 such cases and found gyral herniation in 38 patients but similar findings were also present in one third of the control group cases which might be due to non-specific diagnostic criteria. Smith et al [5] reported a case of idiopathic gyrus rectus herniation resulting in unilateral vision loss which was managed surgically.
CLINICAL PERSPECTIVE

With the limited literature available, the common presentation seems to be acute unilateral vision loss with incomplete superior altitudinal hemianopsia on visual field testing. Imaging is advised to assess the possible aetiology and rule out a systemic condition like neuromyelitis optica or multiple sclerosis.

IMAGING DIAGNOSIS

High resolution MRI of the brain and orbit is ideal for making a diagnosis of this condition. Abnormal increased signal intensity of the optic nerve with impingement by the gyrus rectus can be visualised on coronal and sagittal scans. Comparison with contralateral nerve for symmetry is also useful.

OUTCOME

In case of presence of a focal space-occupying lesion, surgical biopsy with or without complete excision will narrow the diagnosis, while in idiopathic cases, conservative management and patient follow up is required.

TEACHING POINTS

1. Compression of optic nerve by gyrus rectus can lead to optic neuropathy
2. Altered signal intensity is noted in the compressed nerve
3. There is loss of clear CSF space between the nerve and gyrus

Written informed patient consent for publication has been obtained.

Differential Diagnosis List:  Idiopathic herniation of gyrus rectus causing optic neuropathy, Mononeuritis optica, Optic neuritis

Final Diagnosis:  Idiopathic herniation of gyrus rectus causing optic neuropathy

References:

**Description:** Coronal T2 STIR image shows hyperintense right optic nerve (red arrowhead) getting compressed by the herniating gyrus rectus (yellow arrowhead). The internal carotid artery flow void is seen adjacent to the nerve, which is forming the medial boundary of the cavernous sinus. The contralateral optic nerve is normal in signal intensity. **Origin:** Department of Radiodiagnosis, SMS Medical College, Jaipur, Rajasthan
Description: Sagittal T2-weighted image shows the hyperintense right optic nerve being directly compressed by the low-lying gyrus rectus of the frontal lobe with loss of clear CSF space (arrowhead) between the two. Origin: Department of Radiodiagnosis, SMS Medical College, Jaipur, Rajasthan
Description: Axial T2 STIR image shows hyperintense right optic nerve with hyperintensity in the intracranial and chiasmatic part of the nerve (arrowhead). The opposite left optic nerve is of normal signal intensity. Origin: Department of Radiodiagnosis, SMS Medical College, Jaipur, Rajasthan
Figure 4

Description: Sagittal T2-weighted image showing the contralateral optic nerve with normal signal intensity with a clear CSF space between the gyrus rectus and the nerve (arrowhead). Origin: Department of Radiodiagnosis, SMS Medical College, Jaipur, Rajasthan