Isolated bilateral oculomotor nerve palsies due to a midbrain cavernous malformation

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DESCRIPTION

A 41-year-old woman in good health developed diplopia during work on the day of admission. She denied any weakness, headache or change in mental status. Her blood pressure was normal on admission. Physical examination found bilateral ptosis with a limitation in elevation in both eyes. The adduction and depression were impaired on the left eye. The left pupil was dilated and non-reactive (figure 1). The remaining neurological examination was unremarkable. The blood tests showed a normal full blood count and clotting profile. CT of the brain revealed a midbrain haematoma. MRI showed a 0.6 cm T2-weighted heterogeneous lesion at left midbrain with previous haemorrhage which was suggestive of a cavernous malformation (figure 2). A standard catheter cerebral angiogram was normal. The patient was referred to neurosurgeon for further management.

In this patient, the bilateral oculomotor nerve palsies which were more marked on the left side can be explained by nuclear as well as fascicular

involvement. The third nerve nucleus is located in the periaqueductal grey matter and consists of a complex of subnuclei. There is a singular subnucleus innervating both levator palpebrae superioris muscles, therefore a single lesion affecting this nucleus will produce bilateral ptosis. Similarly, although there are two separate paramedian superior rectus nuclei, there is crossing of fibres between the two subnuclei. Therefore, similarly a unilateral nuclear lesion can produce bilateral superior rectus palsy. Conversely, the unilateral pupillary involvement suggests some fascicular involvement. If the pupillary inactivity was due to nuclear involvement, again bilateral mydriasis would be much more likely than unilateral. The absence of an associated impairment of limbs suggests a posterior midbrain lesion.

Midbrain cavernous malformations result in isolated third nerve palsies without other significant non-ocular signs are rare. Brainstem cavernous malformation accounts for 9–35% of all cavernous malformation,^{1 2} it is associated with increased frequency of re-bleeding and surgical treatment is needed to prevent re-bleeding.

Figure 1 Isolated bilateral oculomotor nerve palsies. Physical examination found bilateral ptosis with a limitation in elevation in both eyes. The adduction and depression were impaired on the left eye. The left pupil was dilated and non-reactive.

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Figure 2 Left midbrain cavernous malformation. MRI showed a 0.6 cm T2-weighted heterogeneous lesion with blooming artefact in gradient echo sequencing at left midbrain (arrows) which was suggestive of a cavernous malformation.

Learning points

- ▶ Isolated bilateral oculomotor nerve palsies can be secondary to midbrain cavernous malformations.
- ▶ This rare condition should be considered because of the high risks of rebleeding and therapeutic implications of the underlying disease.

Competing interests None.

Patient consent Obtained.

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