Neuroimaging to avoid pitfalls in the diagnosis of primary headaches

A 55-year-old woman complained of the recent onset of headache attacks fulfilling the international diagnostic criteria (ICHD-2) [1] for migraine with aura (MA). Because of the high frequency of the episodes since the beginning and the atypical age of onset, a cerebral CT scan was suggested.

Imaging Findings:

The CT scan (Fig. 1) documented the presence of a homogeneous expansive hyperdense round-shaped mass with a clear outline (maximum diameter 20 mm), located in the antero-superior portion of the third ventricle. It occluded the foramen of Monro, determining hypertensive hydrocephalus with dilated left lateral ventricle.

A subsequent cerebral MR showed a homogeneous mass hyperintense (Fig. 2) and iso-hypointense (Fig. 3) on T1WI and T2WI sequences respectively, determining hypertensive hydrocephalus. Fig. 4 shows the typical “black hole” effect, indicating the different proteinaceous contenents. Transependymal CSF flow was present (Fig. 5). The lesion did not show enhancement post-gadolinium (Fig. 6).

MR confirmed the previous CT findings about the nature of the lesion, indicating a colloid cyst of the third ventricle. CT density and MR signal of the lesion generally reflect the hydration state and preoteinceous contents.

Discussion:

Background: The diagnosis of primary headaches depends on the features of the attacks, which must fulfil the ICHD-2 criteria [1], and on the normality of general and neurological examinations. Both of them must apply: if not the case, neuroimaging must rule out the presence of an underlying causal condition, as cases with clinical features mimicking primary headaches but of secondary origin have been described [2, 3].

Clinical Perspective: Clinical pictures, which at the beginning are virtually indistinguishable from a primary headache, may later turn out to be related to a secondary cause. MA is characterised by the presence of transient focal neurological symptoms that usually precede the pain phase: the most common of them consists in transient visual disturbance which gradually develop, usually involving the visual hemifield with an emianoptic distribution. Because of these particular features, in most of the cases the diagnosis of MA is simply reached. Organic pathologies, such as intracranial arteriovenous malformations and brain tumours, have been reported as the possible cause of MA-like attacks. The patients reported underwent neuroradiological investigations mostly for: i. the late onset of MA, a primary headache which reaches the maximum prevalence in the third decade; ii. the high...
frequency of the attacks (2 per day).

Outcome: The lesion was removed with a frontal transcortical approach. In the following postoperative period the neurological examination did not reveal sensitive or motor deficits. After the removal of the lesion, the migraine with aura and the typical aura without headache episodes did not recur (follow-up: 15 months). The histology of the lesion confirmed the radiological diagnosis.

Take Home message: Beyond the peculiarity of this case (location of the lesion, migraine with aura attacks probably related to the transitory increase of intracranial pressure, disappearance of the symptoms after surgical removal), neuroimaging is pivotal in patients complaining of a recent onset of a new headache, even if formally indistinguishable from a primary form.

**Differential Diagnosis List:** MA secondary to colloid cyst of the third ventricle, Subependymoma, Craniopharyngioma, Neurocysticercosis, Choroid plexus papilloma, CSF flow artifact

**Final Diagnosis:** MA secondary to colloid cyst of the third ventricle

**References:**


Description: Axial T1WI MR shows a hyperintense mass in the foramen of Monro, determining severe obstructive hydrocephalus with dilated lateral ventricle. Origin: Department of Radiodiagnostic, SS Giovanni e Paolo Hospital, Venice, Italy
Figure 2

Description: Axial CT

Image shows a classic colloid cyst, seen here as a hyperdense mass wedged into the foramen of Monro and upper 3rd ventricle. **Origin:** Department of Radiodiagnostic, SS Giovanni e Paolo Hospital, Venice, Italy
**Description:** Axial T2WI MR shows a mass isointense to brain in the foramen of Monro. **Origin:** Department of Radiodiagnostic, SS Giovanni e Paolo Hospital, Venice, Italy
Description: Coronal fluid attenuated inversion recovery (FLAIR) in patient with a colloid cyst shows the "black hole" effect, a focus of profound hypointensity within the hyperintense lesion caused by ispissated dessicaded proteinaceous contents. Origin: Department of Radiodiagnostic, SS Giovanni e Paolo Hospital, Venice, Italy
Figure 5

Description: Axial T2WI MR shows transependymal CSF flow. Origin: Department of Radiodiagnostic, SS Giovanni e Paolo Hospital, Venice, Italy
Description: Axial T1WI MR shows no enhancement post-contrast. Origin: Department of Radiodiagnostic, SS Giovanni e Paolo Hospital, Venice, Italy