

Suprasellar Meningioma Causing Papilledema and Hallucinations

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THE CASE

A 61-year-old woman had noted the sudden onset of visual hallucinations one year before examination. She described the hallucinations as complex visual scenes, extremely realistic and consisting of unfamiliar persons having conversations, occupying any part of the visual field, recurring quite regularly in the evening, especially when she was lying on her back resting. The patient denied hallucinations when she was in a prone and/or lateral position and has an insight that the phenomena are not real.

The patient's examination showed normal higher mental functions, bilateral papilledema and diminished vision in both eyes. Motor, sensory and cerebellar examinations were normal. Daytime EEG and neuropsychological examination (Beck Depression Inventory, MMSE, Frontal Assessment Battery) were normal.

QUESTIONS

1. Describe the abnormality shown in Figure 1. What should you do next?
2. What is the cause of the abnormality in this case and what are the other causes in general?
3. How would you treat her?

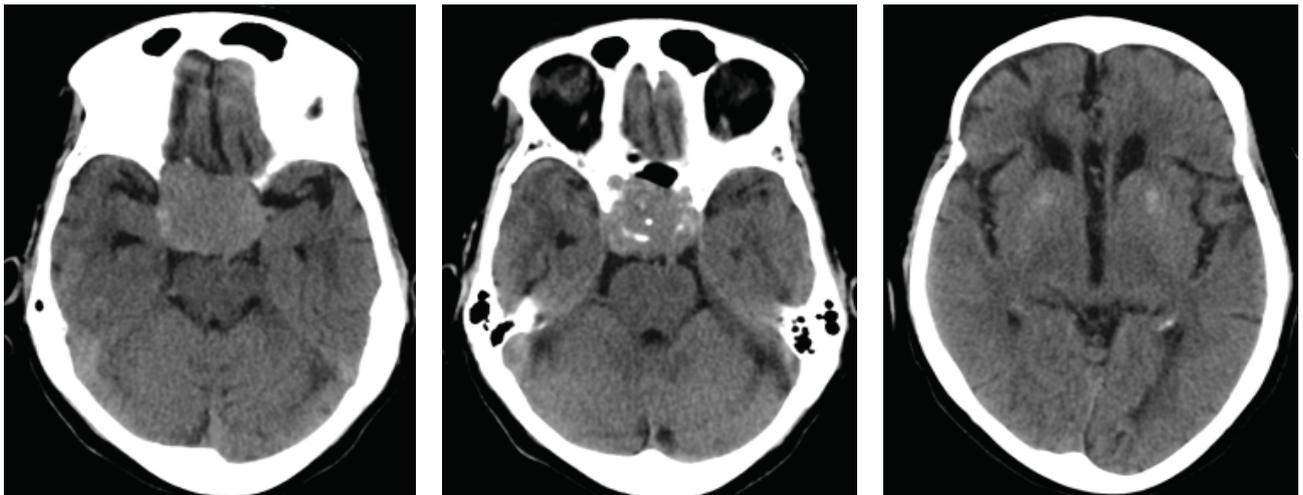


FIGURE 1.

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ANSWERS

1. Non-enhanced CT scan of brain shows heterogeneously slightly hyperdense suprasellar large mass measuring 3.6 x 3.1 cm in cross-sectional image and 2.2 cm craniocaudally with tiny calcification at the center and superior aspect.

The sella turcica is slightly enlarged. There was evidence of right frontal lobe encephalomalacia with craniotomy. No obstructive hydrocephalus was noticed, and posterior fossa and basal cistern are intact. No acute intra or extra-axial hematoma observed.

The differential diagnosis would include meningioma, pituitary macroadenoma, saccular aneurysm and less likely, craniopharyngioma and lymphoma. Further evaluation by MRI of the brain pre and post-gadolinium administration was highly recommended (Fig. 2).

Axial T1 and T2, FLAIR diffusion with sagittal T1, T2 and post-contrast images were noted in the MRI. Redemonstration of the previously suprasellar mass, which is characterized by homogeneous isosignal intensity to the cerebral cortex on T1 and T2 with strong uniform enhancement post-contrast images was observed. The mass measures 3.7 x 2.9 x 2.5

cm in transverse AP and craniocaudal dimensions, respectively and shows well demarcated outlines. A line of separation between the mass and the pituitary gland can be identified on sagittal plane. A dural tail along the posterior surface of the clivus was noted and the associated cerebral vasogenic edema involving the bilateral basal frontal and temporal lobes. The mass exerts a mass effect on the left side of the mid-brain, medial aspect of the right temporal lobe and at the inferior aspect of the right frontal lobe. The optic chiasm was displaced superiorly, both optic nerves are displaced laterally and the right optic nerve was inseparable from the mass. Findings are consistent with suprasellar meningioma.

2. Hallucinations are defined as perceptual experiences that occur in the absence of external sensory input stimulus and are spontaneous, unwilled and cannot be readily controlled. Visual hallucinations can be classified in different ways including simple *vs.* complex, formed *vs.* unformed, positive *vs.* negative or stereotypic *vs.* random. Visual hallucinations are not specific to dysfunction in a particular brain region but have been observed in many neurologic conditions as well as functional or psychiatric disorders. Visual hallucinations, in the absence of hallucinations in

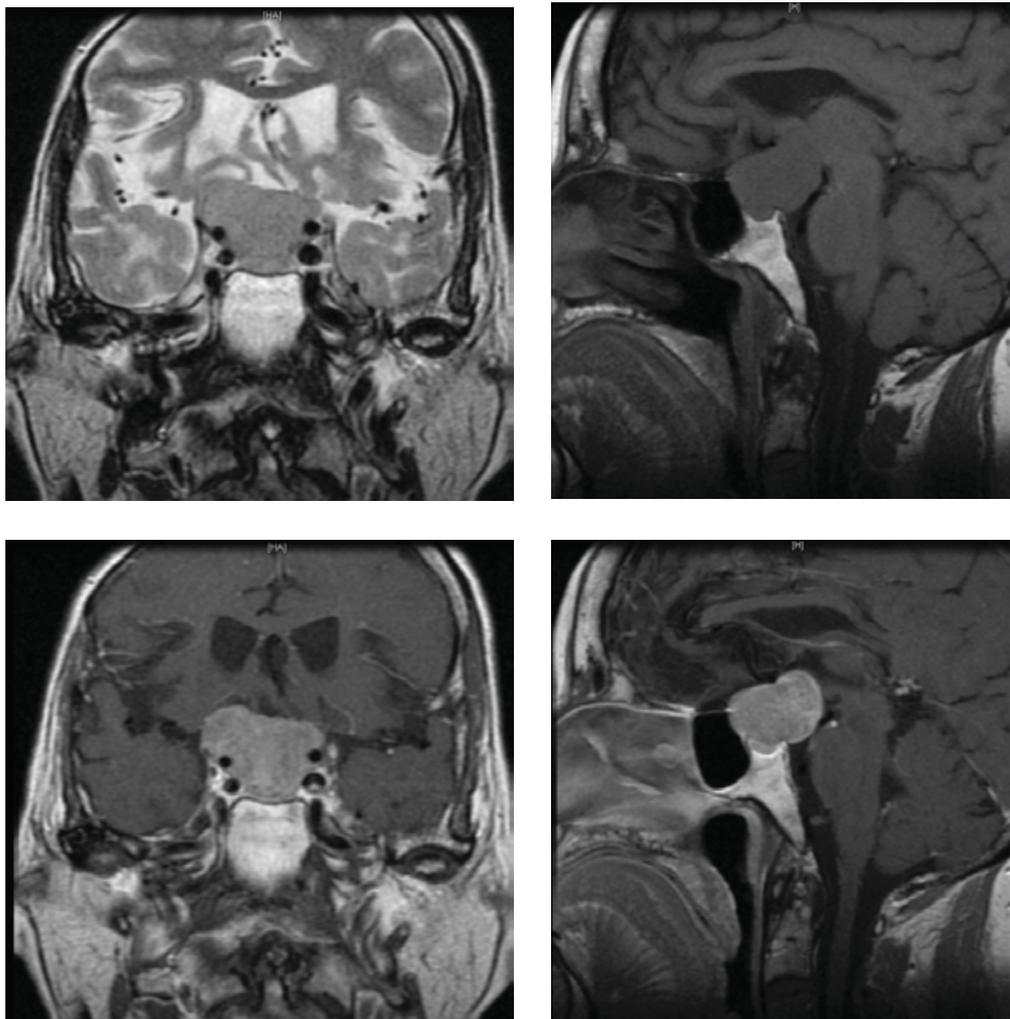


FIGURE 2.

TABLE 1.
Common causes of visual hallucinations.

- Migraine
- Epilepsy
- Strokes restricted to either the thalamus or the pars reticulata of the substantia nigra.
- Tumors: glioblastoma multiforme, metastasis, medulloblastoma, benign slow growing tumors such as pilocytic astrocytoma, craniopharyngioma, meningioma, or chordoma
- Dementia with Lewy body (DLB)
- Parkinson's disease
- Delirium tremens
- Ophthalmologic: retinal diseases, cataracts, enucleation, glaucoma, choroidal and macular diseases Bonnet syndrome and optic nerve disorders
- Peduncular hallucinations due to vascular lesions and
- Brain stem lesions
- Narcolepsy
- Toxic causes: alcohol and hallucinogens and Lysergic acid (LSD)
- Metabolic disorders (hypoglycemia, electrolyte imbalance)
- Psychiatric causes: Schizophrenia, schizoaffective disorders, intense emotional experiences and affective and conversion disorders
- Sensory and sleep deprivation

other sensory modalities, are suggestive of an organic pathology. Peduncular hallucinations were first described by Lhermitte and Levy^[1] in 1922 a 75-year-old woman with a mesencephalic infarct who saw animals and people in the room with her, especially at nightfall. The name was supplied by van Bogaert in 1924. They consist of striking vivid hallucinations, usually visual but occasionally auditory, tactile, or visual with these components. They usually consist of variable sequential scenes, often coming on in the evening with eye closure, and are associated with insight that the phenomena are not real. They differ from the hallucinations of schizophrenia in that they do not have symbolic significance and are not incorporated into delusional thinking (Table 1).

Although there are several theories speculating on the cause of PH, there is presently not one accepted etiology. One theory is that the brainstem plays an integral role in suppressing visual hallucinations, and the spontaneous activity of the visual system increases if this is disrupted, leading to hallucinations. They occur when the inhibitory control of the Pontine-geniculate-occipital system is suspended. The thalamic gating mechanism for processing incoming sensory information may be enhanced, and the activity of the cerebral cortical visual system, especially that of visual association areas, could be "disinhibited." It has been proposed that a neurotransmitter imbalance, involving a relative increase in the ratio of serotonin to acetylcholine activity, may be responsible for the syndrome.

- 3) Peduncular hallucinations are individually brief, often do not recur for many days and usually do not require therapy for symptomatic relief. Drugs that are often effective against visual hallucinations of various causes including clozapine, and olanzapine might also be considered. These medications have dual action as

a dopamine 2/serotonin 2A receptor antagonist. They improve sleep continuity, sleep quality, and increase slow wave sleep, a potentially unforeseen benefit in peduncular hallucinations due to sleep disturbances that are typically present. In our case, the use of medication and the surgical resection of the tumor resulted is dramatic important of the patients visual hallucinations.

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