

SHORT COMMUNICATION

Complex hallucinations following occipital lobe damage

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Visual hallucinations may accompany many neurological and psychiatric disorders. A common localization principle is that lesions to the early sensory cortices lead to elementary hallucinations, whereas complex perceptual experiences are related to the pathology of higher-level cortical regions. We report the case of a patient who experienced complex, non-stereotyped, multimodal (visual and somatosensory) hallucinations following an acute ischaemic vascular lesion in the right medial occipital lobe. This illustrates that the phenomenology of hallucinations not necessarily reflects the exact localization of cerebral pathology. Instead, the damaged area may serve as a focus of an abnormally activated neuronal network.

Introduction

Visual hallucinations often appear as clinical manifestations of cortical lesions with different aetiologies. Clinical observations and neurocognitive studies suggest that simple hallucinations (e.g. photopsia) reflect occipital pathologies, whereas complex hallucinations of animate items, objects, and scenes are related to damage to the occipito-temporal and occipito-parietal visual association neocortex (Kolmel, 1993). In many cases, these complex hallucinatory phenomena may suggest generalized cerebral or systematic pathological processes, especially when they affect more sensory modalities. In addition, hallucinations are common in numerous psychiatric disorders, which raise important differential diagnostic questions (Kaplan and Sadock, 1998). Here we describe a patient with complex, non-stereotyped multimodal hallucinations following an acute ischaemic vascular lesion in the right medial occipital lobe. This case illustrates that the quality of hallucinations not necessarily refers to the exact localization of cerebral pathologies, reflecting the abnormal functioning of a large-scale neuronal network.

Case study

RA, a 76-year-old right-handed Caucasian man, suddenly started to experience the visual appearance of urban scenes with moving children, people and cars in his left inferior visual quadrant field. He was able to give detailed descriptions of faces, gestures, dressing

and movements of animate items, as well as the type and colour of the cars. The patient also felt that the walking children often touched the bottom part of his left leg. No auditory components were present and the vast majority of images were not related to personal memories. The patient had no history of previous neurological or psychiatric disorders. Apart from the perceptual anomalies, the mental-status examination revealed no psychiatric symptoms with preserved orientation, consciousness and reality testing (Mini-Mental State Examination score: 28). The hallucinations persistently appeared in his left inferior quadrantanopic field. The only pathological feature revealed by the neurological evaluations was a left inferior quadrant anopsia. The ophthalmologic examination revealed no other pathology. The routine laboratory examination including serum electrolytes, glucose, liver and kidney functions was normal. Computed tomography examination showed an acute ischaemic vascular lesion localized to the right medial occipital lobe. This finding was confirmed by a head MRI, indicating circumscribed hyperintensity in the right medial occipital lobe on T2-weighted images and FLAIR sequence (Fig. 1). Neither neuroimaging method showed any other significant pathologic change. One week after the onset of symptoms, the hallucinations gradually subsided but the quadrantanopsia remained unchanged.

Discussion

It has been reported that hallucinations of object-fragments (e.g. lines, textures, corners) and simple objects (but not scenes) can be localized to the affected part of the visual field in patients with hemianopsia (Lance, 1976; Kolmel, 1993; Anderson and Rizzo, 1994; Vaphiades *et al.*, 1996). However, hallucinatory

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Figure 1 T2-weighted MRI image showing the right medial occipital lobe lesion.

phenomena in the quadrantoptic field are extremely rare. These hallucinations are regularly stereotyped, fragmented and do not include components from other sensory modalities. Moreover, in most reported quadrantoptic cases the pathological process is not restricted to the occipital lobe. Most strikingly, a recent report found that in patients with occipital lobe seizures, complex hallucinations never occurred (Bien *et al.*, 2000). The present case report demonstrates that isolated lesions to the occipital lobe can lead to complex visual and somatosensory hallucinations. Interestingly, these experiences were restricted to the left inferior part of space, consistent with the location of the lesion. This suggests that damage to circumscribed areas in lower-level sensory cortex can result in an autonomous assembly of large-scale neuronal networks related to complex cognitive functions (Mesulam, 1998).

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