

PURE TOPOGRAPHICAL DISORIENTATION – THE ANATOMICAL BASIS OF LANDMARK AGNOSIA

Nobuyoshi Takahashi¹ and Mitsuru Kawamura²

(¹Department of Neurology, Kimitsu Chuo Hospital, Kisarazu, Chiba, Japan; ²Department of Neurology, Showa University School of Medicine, Shinagawa-ku, Tokyo, Japan)

ABSTRACT

We used MRI studies of four patients to investigate the lesions responsible for landmark agnosia. A detailed investigation of the relationship between the symptoms and the lesions suggests that the right posterior part of the parahippocampal gyrus is critical for the acquisition of novel information about buildings and landscapes, and that the same region plus the anterior half of the lingual gyrus and the adjacent fusiform gyrus play an important role in the identification of familiar buildings and landscapes. Furthermore, the lesion responsible for prosopagnosia, which frequently occurs with landmark agnosia, seems to involve the posterior half of the lingual and fusiform gyri. This suggests that the lesions responsible for landmark agnosia and prosopagnosia are close to each other, but distinct.

Key words: topographical disorientation, landmark agnosia, parahippocampal gyrus

INTRODUCTION

Topographical disorientation is generally identified as a condition in which patients lose their way in very familiar areas, such as their home neighborhood or the area frequented in the admitting hospital after the onset of illness. We previously proposed classifying topographical disorientation into two categories by symptoms and lesion site (Takahashi et al., 1997). One category is directional (Takahashi et al., 1997) or heading disorientation (Aguirre et al., 1998; Aguirre and D'Esposito, 1999), in which patients are unable to recall the route (or direction) from one location to another. The other category is topographical (De Renzi, 1985), environmental (Landis et al., 1986), or landmark agnosia (Aguirre et al., 1998; Aguirre and D'Esposito, 1999), in which patients are unable to perceive and identify familiar buildings and landscapes. Patients who exhibit directional disorientation can perceive and identify buildings and landscapes, but cannot find the route from one location to another. A lesion in the right retrosplenial region and the medial parietal lobe is responsible (Takahashi et al., 1997). On the other hand, patients who exhibit landmark agnosia can locate a route, but are unable to perceive and identify familiar buildings and landscapes.

Landmark agnosia may occur conjointly with prosopagnosia, and both are associated with a right or bilateral medial occipito-temporal lesions (Landis et al., 1986). Lesions in the lingual and fusiform gyri seem to be particularly associated with prosopagnosia (Takahashi et al., 1995). However, which part of the medial occipito-temporal lobe plays the most crucial role in landmark agnosia is still unclear.

Using MRI, we identified the lesions responsible for landmark agnosia in four patients and investigated the difference between the lesions causing landmark agnosia and those causing prosopagnosia.

MATERIALS AND METHODS

Patients

The demographic and clinical features of the patients entering the study are summarised in Table I.

TABLE I
Summary of the demographic and clinical features of the six patients

Patient	Age/sex	Neurological findings	Neuropsychological findings	Lesion
1	69/M	Left upper quadrantanopsia	Landmark agnosia	Right medial temporal lobe
2	72/M	Left upper quadrantanopsia	Landmark agnosia	Right medial temporo-occipital lobes
3	70/M	Left hemianopsia	Landmark agnosia Prosopagnosia Left hemispatial neglect Constructional disturbances	Right medial temporo-occipital lobes
4	73/M	Left hemianopsia Left hemiplegia Left hemisensors disturbance	Landmark Prosopagnosia Left hemispatial neglect Constructional disturbances	Right medial temporo-occipital lobes Right anterior limb of the internal capsule Right thalamus
5	61/M	Superior altitudinal visual field defect	Prosopagnosia Achromatopsia	Bilateral medial temporo-occipital lobes
6	82/F	Visual field defect (concentric contraction)	Prosopagnosia Left hemispatial neglect Constructional disturbances	Bilateral medial temporo-occipital lobes

We studied four patients (Patients 1-4) who exhibited landmark agnosia, based on the clinical characteristics described below. 1) Patient 1 lost his way only in novel places (for example in the admitting hospital, etc.), but the other three patients (Patients 2-4) lost their way in both novel and familiar places. 2) Patients 2, 3, and 4 had great difficulty identifying photographs of both familiar and novel buildings and landscapes. On the other hand, Patient 1 was able to identify photographs of familiar buildings and landscapes, but had great difficulty identifying novel ones. 3) Within a familiar area, all four patients could recall the positional relationship between two locations and could accurately draw a map of their home neighborhood.

The results of the specific tests used to identify topographical disorientation are summarized in Table II.

Of these four patients, two (Patients 3 and 4) also had prosopagnosia. To investigate whether the same lesion was responsible for both landmark agnosia and prosopagnosia, two more patients (Patients 5 and 6), who exhibited prosopagnosia but no landmark agnosia, were included in the study (see Table I). Patients 3 through 6 have been described previously in a report on prosopagnosia (Takahashi et al., 1995; Patients 3, 4, 5, and 6 correspond to Cases 3, 4, 1, and 2, respectively), and the symptoms of topographical agnosia in Patient 3 have also been reported previously (Takahashi et al., 1989). The etiology of the deficits of all six patients was cerebral infarction in the territory of the posterior cerebral artery.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات