

REACHING TO REMEMBERED SPATIAL LOCATIONS IN A PATIENT WITH NEAR VISUAL SPATIAL NEGLECT AND OPTIC ATAXIA *

A. Iavarone 1, B. Ronga 1, M. Sannino 1, E. Garofalo 1, F.I. Ambra 1, D. d'Alessio 1, S. Diaco 1, T. Marmolo 1, F. Moschiano 1, F. Romano 1, F.P. Serra 1, F. Galeone 2, M. Monda 1, S. Chieffi 1

1. UOC Neurologia, Ospedale CTO, AORN "Ospedali dei Colli", Napoli

2. UO Assistenza Anziani, Distretto 33, ASL Napoli 1 – Centro

3. Dipartimento di Medicina Sperimentale, Università della Campania "Luigi Vanvitelli"

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Introduction

Previous studies suggested that the occipitoparietal stream orients attention toward the near/lower space and is involved in immediate reaching, whereas the occipitotemporal stream orients attention toward the far/upper space and is involved in delayed reaching. Here we report the case of a patient, GP, who showed bilateral damage of occipitoparietal lobes. We examined whether, according to previous studies, the occipitoparietal damage, and the relative integrity of the occipitotemporal stream, produced an attention bias toward the far space. If this was the case, we planned to examine whether the attention bias affected delayed reaching performance, shifting toward the far space remembered target locations. As a whole, these findings would add support for the involvement of the occipitotemporal stream in delayed reaching.

Methods

The patient, GP, is a right-handed woman with 10 years of schooling. As consequence of a malignant hypertensive episode sustained by a left pheochromocytoma she underwent a bilateral damage of the occipital cortex, slightly greater on the right side, with involvement of the adjacent parietal lobes (Figure 1). Clinical and neuropsychological assessment revealed the existence of most of the core symptoms of a Balint syndrome (details online).

GP and healthy controls took part in three experiments. In the experiment 1, the participants bisected lines oriented along radial, vertical, and horizontal axes. The experiment 2 consisted of two tasks: (a) an immediate reaching task, in which GP reached target locations under visual control and (b) a delayed visual reaching task, in which GP and controls were asked to reach remembered target locations visually presented. We measured constant and variable distance and direction errors. In the experiment 3, GP and controls performed a delayed proprioceptive reaching task.

Results

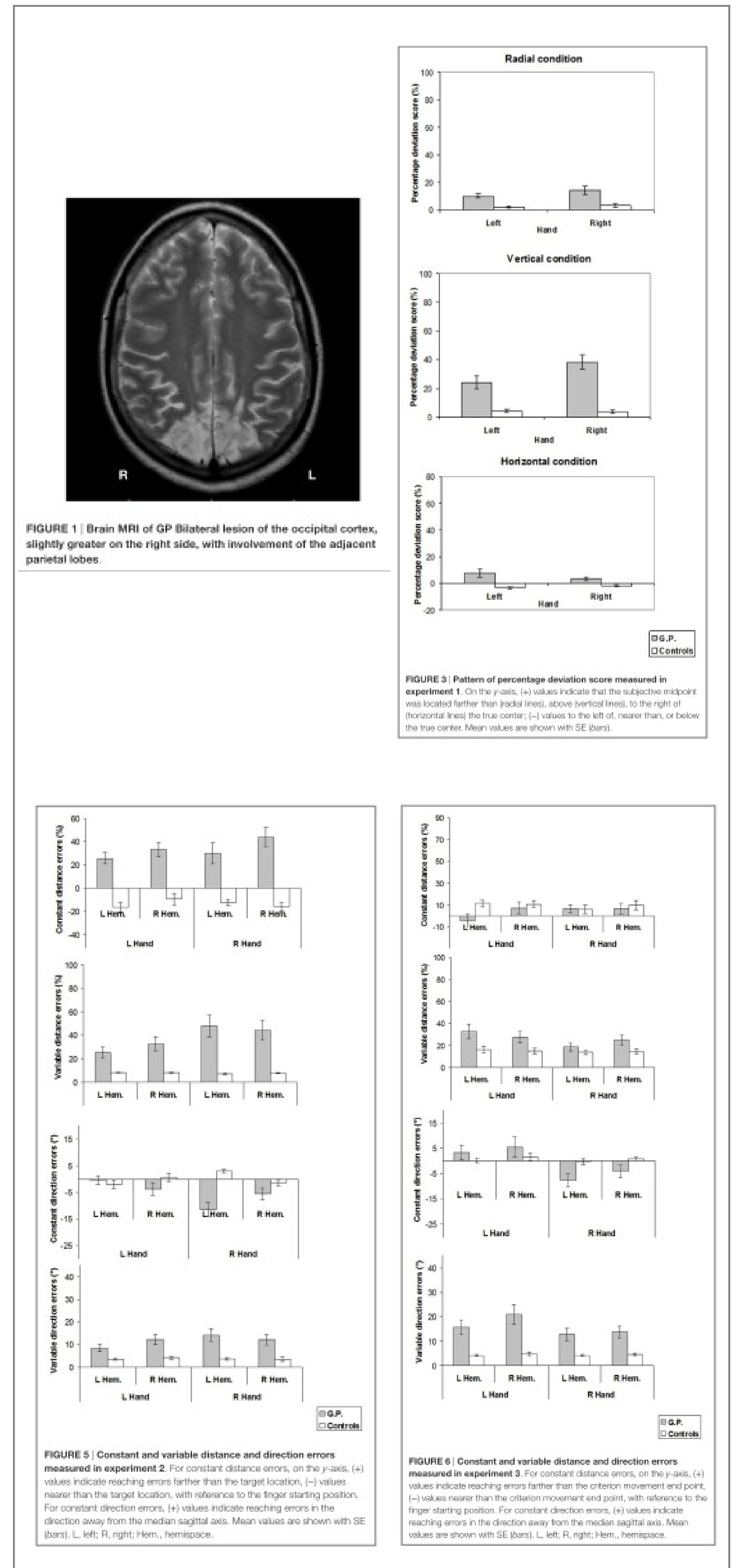
Experiment 1: GP bisected radial lines farther, and vertical lines more above, than the controls, consistent with an attentional bias toward the far/upper space and near/lower space neglect.

Experiment 2 and 3: in immediate reaching task, GP accurately reached target locations. In delayed reaching task, GP overshoot remembered target locations, whereas the controls undershot them. Furthermore, variable errors were greater in GP than in the controls.

Experiment 3: constant reaching errors did not differ between GP and the controls. However, variable direction errors were greater in GP than in the controls. (See Figure 3, 5, 6).

Conclusions

The present study suggests that the occipitoparietal damage, and the relatively intact occipitotemporal region, may produce an attentional orienting bias toward the far/upper space that shifts selectively, in the same direction, remembered visual target locations to be reached. As a whole, these findings further support the view of an involvement of the occipitotemporal stream in delayed reaching. Furthermore, the observation that in both delayed reaching tasks the variable errors were greater in GP than in the controls suggests that it is possible to detect in optic ataxia not only a visuo- but also a proprioceptive-motor integration deficit.



Main references

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