

Cognitive rehabilitation of visual field deficit due to hypoxic-ischemia following an interventricular neurocytoma removal: A case report



Vartanian, M. [1], Khorrami Banaraki, A. [2]

[1] Department of Psychology, University of Tehran
[2] The Institute for Cognitive Science Studies (ICSS)

Introduction

Patients awakening from the hypoxic-ischemic coma face cognitive and visual deficits that might have far-reaching consequences, affecting daily functioning, independence, and living standards. Here, we present the satisfying process of cognitive rehabilitation treatment of a single case (A.M), who was threatened with the sudden change of oxygen volume, causing left occipital parietal hypoxic-ischemia after an interventricular neurocytoma removal. The patient was in a coma for the first 48 hours, after which she showed significant memory and visual deficits as she had lost almost three-quarters of her visual field. See figure 1.

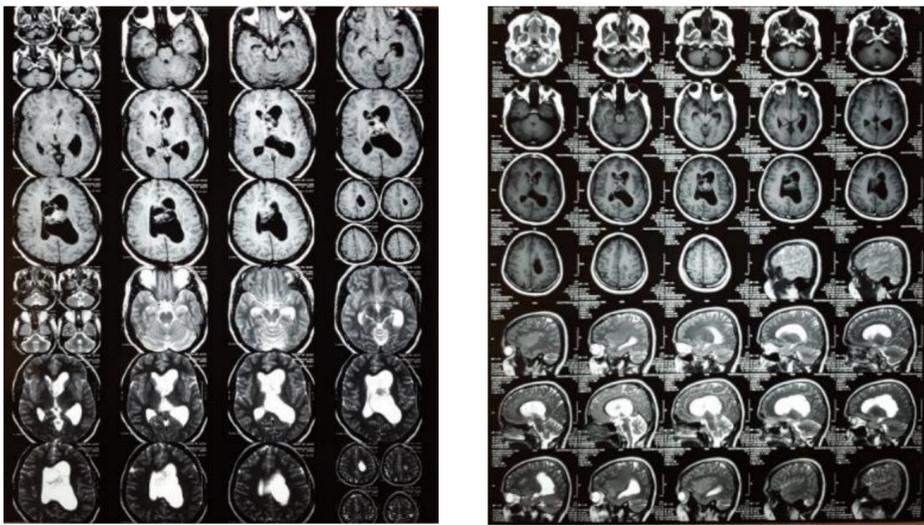


Figure 1 | Showing completely drained left lateral ventricle a few days after surgery. She used to wear nearsighted glasses before the diagnosis. Ophthalmic examinations showed that there were no ocular structural complications.

Methods

Sessions were held twice a week with an overall of 50 sessions. Each lasted about 60 minutes from August 2017 till January 2019. Visual restorative and compensatory training were implemented both on computerized (Rehacom) and non-computerized eye-movement-based exercises. The intervention was interrupted several times due to hospitalization for chronic pancreatitis and pregnancy. After several months she was followed up and the rehabilitation sessions were restarted. See figure 2 & 3.

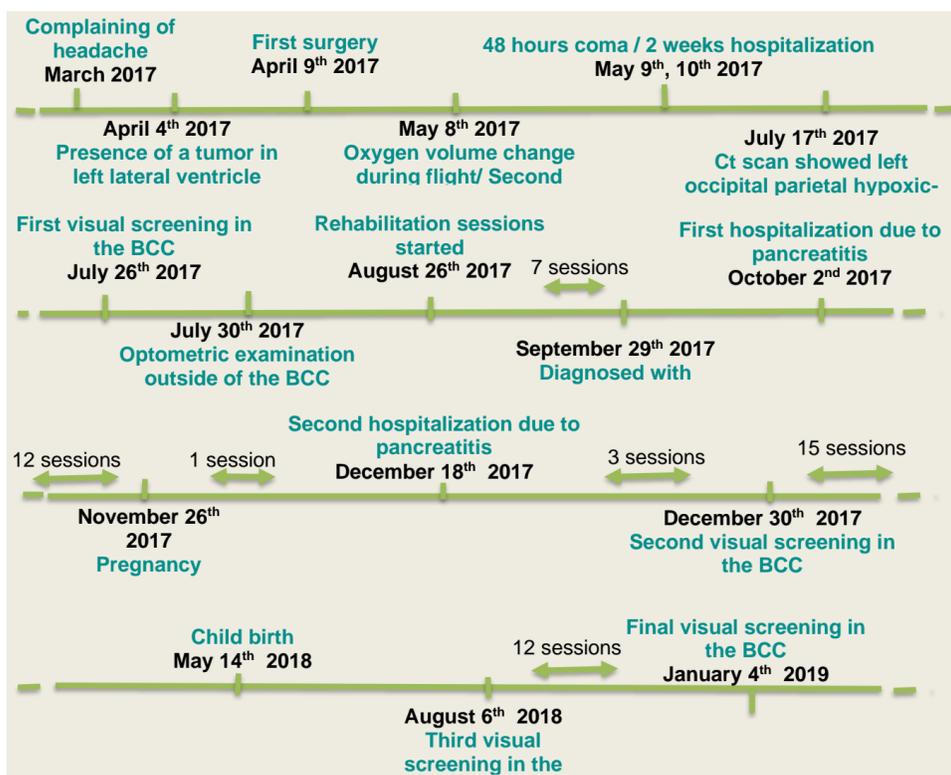


Figure 2 | Timeline showing the whole process from being diagnosed till last visual screening.

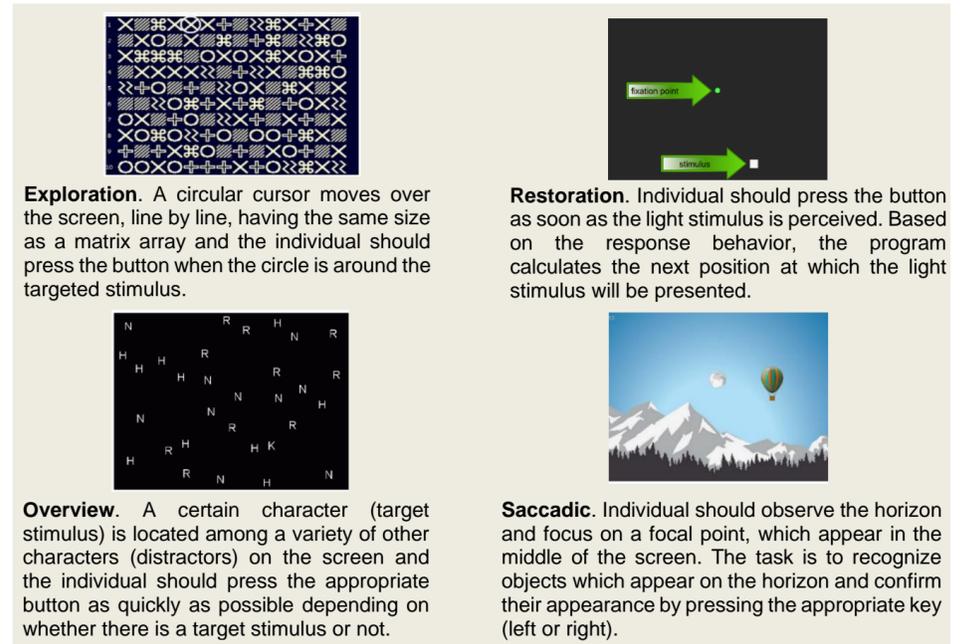


Figure 3 | Exercises from Rehacom visual field module. ©Dajcenter, Tehran, Iran.

Results

In the assessment module, the detected target rate in the top-left quadrant was increased from 13% to 79%, the bottom-right quadrant from 25% to 38%, and the top-right quadrant from blindness (0%) to 4% (see figure 4). During the training module, there was a statistically significant difference in the scores of the reaction time of saccadic and overview training in the right visual field ($p = .040$, $p = .00$), meanwhile, the left visual field showed no significant difference ($p = .063$, $p = .141$) respectively.

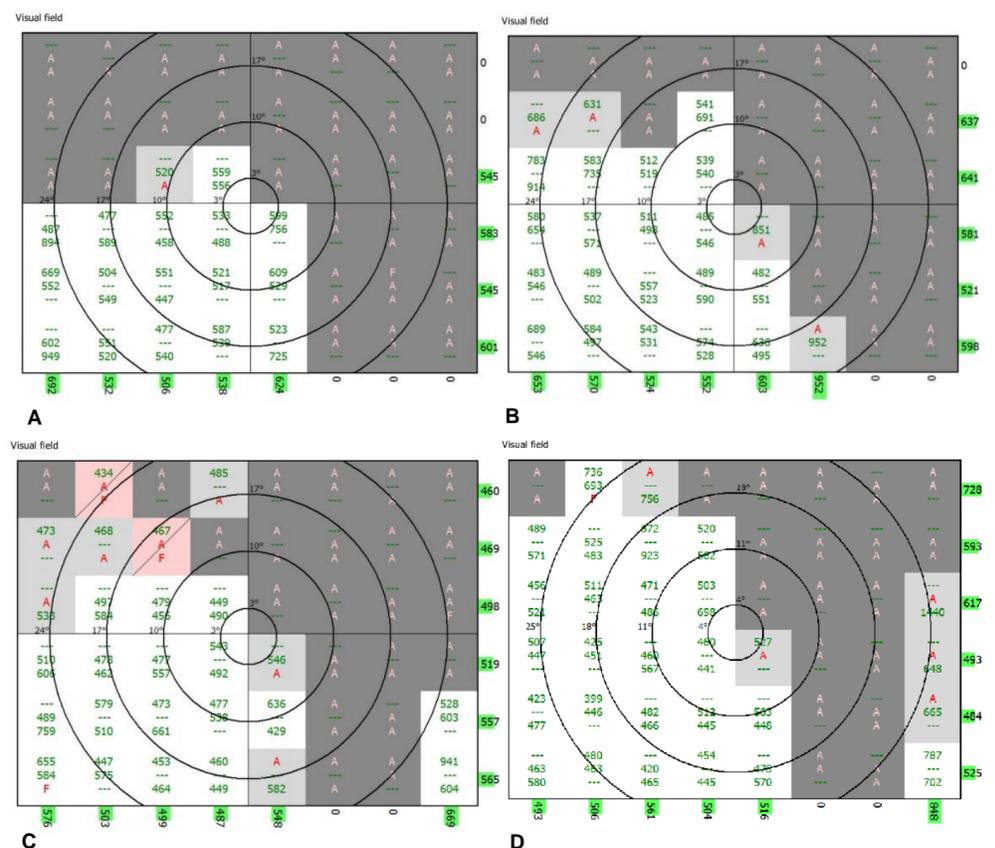


Figure 4 | The visual field assessment within different intervals. (A) July 2017 (B) December 2017 (C) August 2018 and (D) January 2019.

Discussion

The present study tried to enrich the currently available, inexpensive, patient-friendly exercises that can be less time-consuming. However, caution must be taken in drawing firm conclusions from the results of this study as each individual has a different, specific background which may result in different reactions.