

Hemifield Slide Phenomenon- the Double Trouble

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Abstract

Hemifield slide is a sensory phenomenon seen as a sequela of heteronymous visual field defects. Although a rare and under-recognised entity, hemifield slide phenomenon can adversely affect the quality of life. Unfortunately, no specific guidelines have been proposed for the management. Fusional exercises, prisms or surgical correction may be tried, but the diplopia is likely to worsen over time. stereo-typo scope stereo-typoscope is a novel device which can overcome a hemifield slide for near and can help patients to read comfortably.

Keywords: Binocular diplopia; Hemifield slide phenomenon; Stereo-typoscope

Introduction

Binocular diplopia results from a breakdown in the fusional capacity of the binocular system. Among the several potential mechanisms of binocular diplopia, hemifield slide phenomenon remains a rare and under-recognized entity. It is a sensory phenomenon, causing diplopia without paresis of the cranial nerves. The earliest description of this phenomenon was as “non-paretic diplopia” in patients with underlying pituitary adenomas [1,2]. Although typically described with bitemporal hemianopia, it can occur with any heteronymous hemianopic defects like binasal hemianopia or altitudinal field defect [3,4].

Discussion

Physiologically, nasal and temporal visual fields overlap between the right and left eyes. The area of overlap between the visual fields of both eyes allows the corresponding retinal points to be established. The corresponding points have a common visual direction and thus permits fusion and single vision. Ocular manifestations depend on the type of visual field defect as well as the accompanying tropias [5]. In bitemporal hemianopia, each eye has a loss of its temporal field of vision, which results in the absence of overlap of the visual fields between the two eyes. As a result, the corresponding retinal points can't be established which disrupts the normal fusion. This lack of fusion decompensates any pre-existing phoria into a tropia. In orthotropia, with binocular vision, the impaired temporal visual field of each eye is partially compensated for by the contralateral eye's intact nasal visual field (Figure 1A). Hence the image of an object at the point of fixation is seen as single.

In horizontal deviations, the eyes deviate outwards or inwards, causing the two nasal hemi-fields to slide horizontally relative to each other. In exotropia, the eyes deviate outwards horizontally and their corresponding intact nasal fields overlap on one another. A central vertical strip of vision falls on the intact nasal field of both the eyes (Figure 1B). However, due to lack of retinal correspondence between the eyes, this central strip is perceived to be at different points. This results in duplication of the vertical strip, manifesting as horizontal diplopia without binocular confusion. In esotropia, the eyes deviate inwards horizontally and their corresponding intact nasal fields move away from one another. The central strip of vision falls on the impaired temporal hemifield of each eye, manifesting as a central vertical scotoma (Figure 1C). This is less troublesome when compared with diplopia.

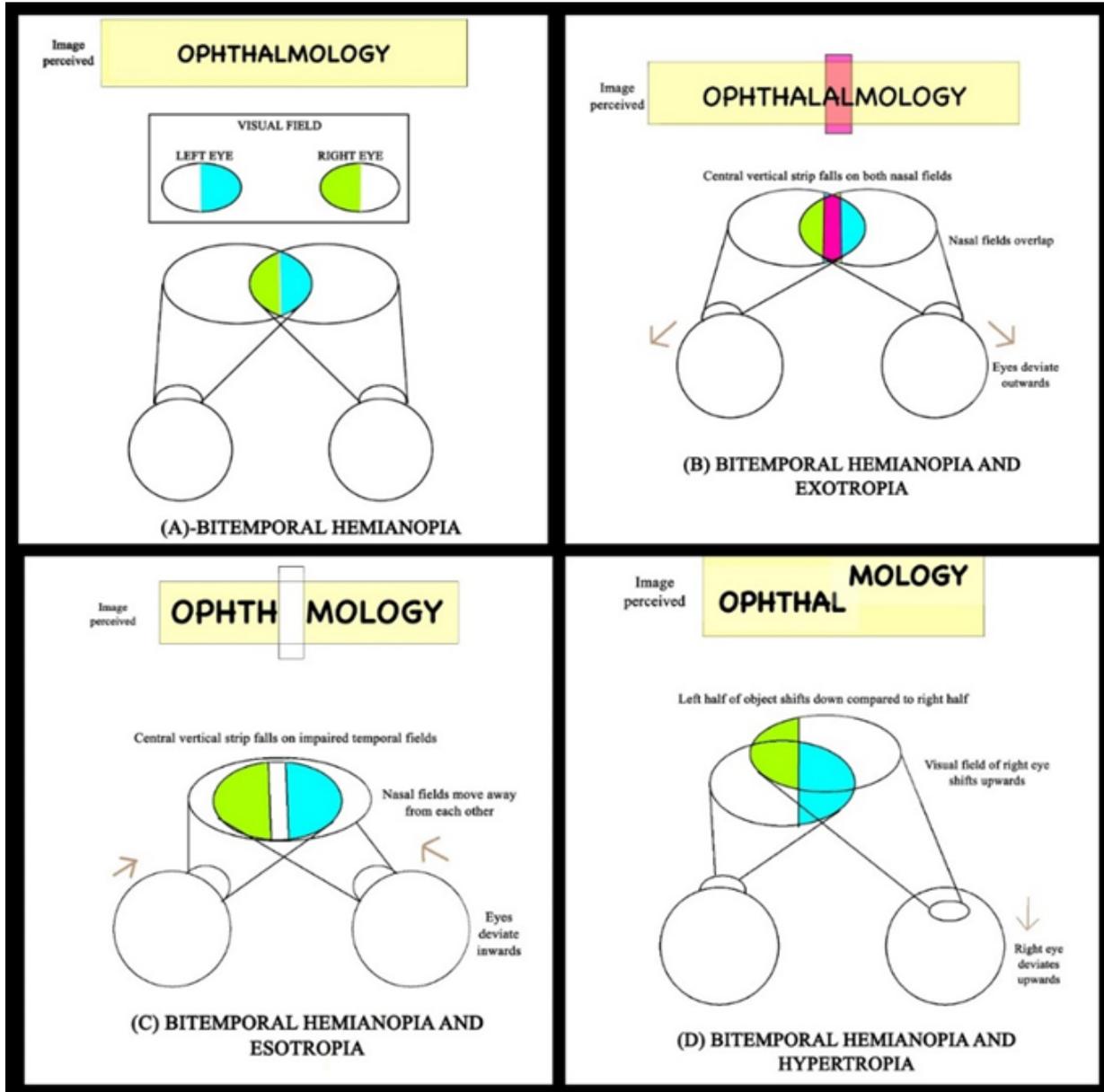


Figure 1: Mechanism of hemifield slide phenomenon.

- a) Bitemporal Hemianopia.
- b) Bitemporal Hemianopia and Exotropia.
- c) Bitemporal Hemianopia and Esotropia.
- d) Bitemporal Hemianopia and Hypertropia.

In vertical deviations, the eyes deviate upwards or downwards, causing the visual hemifields to slide vertically respective to one other (Figure 1D). For example, in hypertropia, the eyes deviate upwards. Left half of the object is displaced downwards compared to the right half of the object resulting in split diplopia.

Currently no specific treatment guidelines exist for management of hemifield slide phenomenon. In cases of respectable intracranial tumor like a pituitary macroadenoma, surgical resection is the choice when medical management has failed or is not applicable [6]. Prisms may decrease symptoms in partial bitemporal hemianopia where there is sufficient area of retinal correspondence. Fusional

convergence exercises can aid in fusion of visual fields in cases of horizontal deviations [7]. Stereo-typoscope (Figure 2) is a simple reading aid developed recently to alleviate the disturbing diplopia for near [8]. It works on the principle that midline stereopsis operates without corresponding retinal points. In bitemporal hemianopia, posterior midline falls in post fixational scotoma. Stereo-typoscope provides an anterior midline stereoscopic stimulus which trigger fusional eye movements. It is made of cardboard of some thickness to provide depth/disparity. Surface has high contrast vertical stripes that provide strong stimuli for disparity and stereopsis in near periphery.

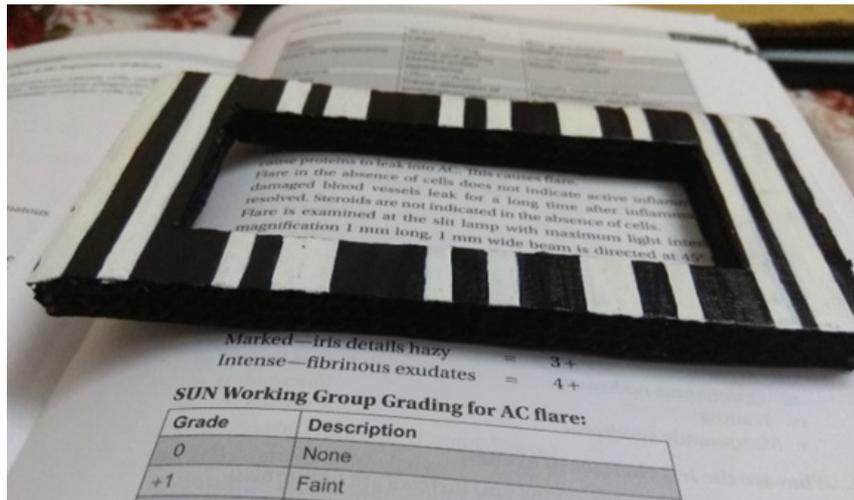


Figure 2: Stereo-typoscope.

Conclusion

It is recommended that all patients with hemifield slide phenomenon gets a detailed visual field testing and orthoptic evaluation to identify areas of binocular fusion. In addition, Simple modalities like fusional vergence exercises and stereo-typoscope can bring relief to the distressing symptoms produced by hemifield slide phenomenon.

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