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A Case In Point

The Management of Visual Field Defects Through Low Vision Aids

Case #1

History

Mr. A. J., age 72, suffered from a vascular accident which resulted in restricted visual fields to a 10° with macular sparing in the left eye and light perception in the right. The patient also suffered limited speech and poor localization. Mr. A. J.'s mobility was severely limited due to his 10° fields and it was quite uncomfortable and confusing while eating, as he was unable to find the food on his plate.[a]

Management

Fresnel prisms were demonstrated for mobility and eating and were accepted quite well by the patient. Two 15-diopter prisms were mounted on the concave side of the left lens mounted in a rimless frame. The prisms were placed so the temporal prism was base out and the nasal prism was base in with a separation of 15 millimeters between the prisms. This allowed Mr. A. J., by moving his eyes from side to side, to bring the peripheral vision into view. This made walking more comfortable as his field of view became wider. Even though his speech and actions had been slowed down due to the vascular accident, his mobility increased and he now had a twinkle in his eye.

For eating, an Ultex shaped 15-diopter Fresnel prism base down was mounted on his present near correction like a bifocal segment. This allowed Mr. A. J. to see what was directly in front of him at the dinner table and with practice he was able to locate food items with ease. Without the prism for eating, he had to grope with his hand to find food items prior to using his fork.

Case #2

History

Mr. T. T., age 29, presented with a right, homonymous hemianopia with macular sparing, from a hunting accident (gunshot wound). Mr. T. T.'s complaint was that he did not see anything to his right side and constantly would bump into objects.

Management

Mr. T. T. did not require a correction lens so a plano rimless spectacle was ordered and a 15-diopter Fresnel prism was applied on the temporal side of the right lens with the base of the prism directed toward the right. The prism was placed 15 mm. to the right of the center of the pupil. By moving his eye into the prism the right side came into view. T. T. had to overcome the prismatic distortion caused by the prism, and with practice his mobility improved considerably.

One interesting note about Mr. T. T. is that he tried driving with this lens and hit a car coming from his right side. It was previously explained that this device was for mobility while walking and was not an aid for driving.

Discussion

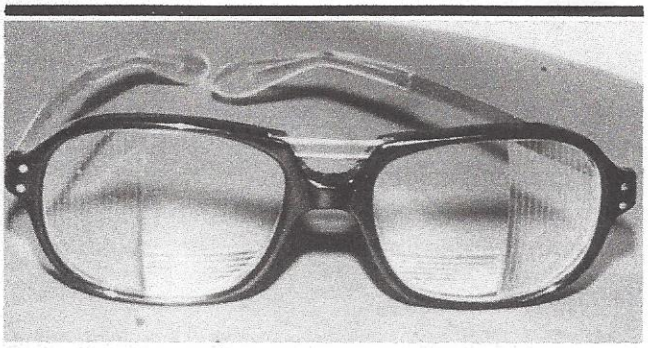
Field defect patients most benefited with prisms and reverse telescopes are those with restricted peripheral field due to stroke, tumors, or trauma resulting in hemianoptic contractions; and patients with retinitis pigmentosa or glaucoma resulting in peripheral constriction of the visual field to less than 20°.

The most widely used method to increase the peripheral field is the application of prisms. When a prism is placed in the blind hemianoptic field with the base (of the prism) in the direction of the field loss, optically the image moves closer to the midline (the sighted portion of the visual field) as the eye is moved in the direction of the field loss. Optometrists have used 10 to 30 prism diopters mounted on a spectacle correction to get the proper results. Most find that between 15-20 prism diopters produces the best patient response.

The patient generally learns to move his/her eyes in the direction of the visual field loss, creating a better mobility as the blind field area becomes visible. With little practice, mobility may be noticeably improved at the first visit. However, motivation is the prime factor in patient success!

Application of prisms

The prism may consist of glass, cemented to a spectacle lens leaving a thick prismatic edge and



Fresnel prisms adhering to lenses to expand the visual field

resultant weight addition, or a thin plastic membrane, a Fresnel prism, that can be attached by means of a simple procedure to the concave side of the spectacle lens. This is done by immersing both the Fresnel prism and lens under water, placing the properly shaped prism (shaped to the lens pattern) into place on the lens and pressing out all of the air bubbles. Until the Fresnel lens dries, it is moveable on the prescription lens and can be moved to the most effective position. Rubbing alcohol can also be used as a bonding agent and it is not necessary to immerse both lenses into the solution to apply. When the lens dries, the Fresnel prism is bonded tightly to the glass or plastic prescription lens but can be removed if need be by inserting a fingernail underneath the prism and prying it loose. It can be reapplied at any time following the same procedure.

Other aids that work for some patients

A minus lens

Between 50 and 10 diopters, hand-held before the eye, produces a minified, virtual, upright image and the lens is easy to carry. It functions like a reverse telescope in that the patient must stop walking to view through it or become spatially disorganized.

Reverse telescopes

Shrink the visual world, thereby crowding more of what is viewed into a smaller space. It appears logical, therefore, that this would be a solution for a restricted visual field of less than 20°. Some drawbacks of this method have been image distortion, loss of acuity, and loss of spatial localization. These devices should be tried to elicit patient responses, good or bad. Walters, Ocutech, and Designs for Vision make telescopes that can be reversed for image minification, which can be mounted in spectacles for this purpose.

Mirror systems have been used successfully also, primarily with hemianopsias. The mirror is attached to a spectacle frame in the seeing portion of the visual field, sometimes confusing the patient visually. He must now look away from his nonseeing area to see what is on his blind side (the opposite direction to the field loss). This device takes much training to use.

The closed circuit television (CCTV) is used quite successfully with all types of visual field defects including quadrant sector defects and extremely reduced central fields to 5 degrees. The CCTV may enable the patient to read, study, and even write and thus more efficiently overcoming visual field restrictions.

Summary

Devices that make the field restricted patient have better mobility, whether it is the device itself or the learning of eye movements by training and scanning, are very beneficial to the motivated patient. They also help the patient regain personal self-confidence in his ability to cope with the world around him. Prisms, mirror systems, reverse telescopes, and CCTV can all accomplish this for certain patients. **AOA**

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FOOTNOTE

a. A 10° field of vision provides only a two-inch width of field at twelve inches, thus the difficulty in seeing food on one's plate.

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