Background

Homonymous hemianopsias are a common type of visual field defect seen in patients with traumatic brain injuries. In a homonymous hemianopsia, the patient experiences visual field loss in each eye on the same side. Prisms are often used to compensate for the reduced field. By placing the base towards the absent field, the image is shifted into the patient’s view. However, some patients can have difficulty adapting to prisms and find them cosmetically displeasing. Vision therapy is another option to help patients adjust to their acquired defects. This case report details a patient who found improved quality of life after a traumatic brain injury through a vision therapy program.

Case Summary

A 69-year-old Hispanic female presented for a comprehensive eye exam following a right cerebral hemorrhage. The patient reported difficulty with normal daily activities and had since moved in with her daughter for assistance. While reading, she would miss the beginning of each new line. Her daughter reported that the patient had a tendency unknowingly to turn her body towards her left. Her visual field defect led to frequent accidental injuries by reducing her awareness of certain obstacles.

The patient’s entering distance visual acuity with her habitual lenses of 2 years was 20/20 OD, 20/25 OS, and 20/20 OU. Her cover test revealed no manifest strabismus, and she was able to converge to the nose. Pupils and EOMS were normal. Confrontation visual fields showed constriction of the left field in each eye. The dilated eye exam revealed 2+ NS OU. All other ocular health was unremarkable. A 120 point screening field was performed on each eye alone. Her daughter reported that the patient had a tendency to lean her head to her left. Her visual field defect led to frequent accidental injuries by reducing her awareness of certain obstacles.

Vision Therapy Program

The patient began weekly vision therapy sessions for 30 minutes at a time. Therapy focused on ocular motor activities, peripheral awareness, spatial organization, and bilateral integration. The patient was committed to attending therapy each week and was motivated to work hard during each session. Examples of the activities include:

- **Vision Builder Saccades**
  
  The computer program was projected onto the wall of the office. As arrows appeared in various locations, the patient was required to press the correct direction arrow on a keyboard. The size of the arrow stimulus decreased as the patient improved with the activity. The patient reported that the arrows were hardest to identify when they appeared on the left side. Over time she learned that if she was having trouble locating the arrow that it was most likely located on the left side and that she should focus her attention to that area. The patient had a similar computerized program at home that she worked on for 15 minutes per day.

- **Peripheral Awareness with Black and White Tiles**
  
  The patient stood approximately 4 feet away from a chart on the wall. The chart consisted of various numbers contained in black or white circles. There were 5 numbers per row and 5 rows on the page. One black tile and one white tile were placed on either side and slightly in front of the patient. The patient held a wooden dowel in each hand. The patient was instructed to read off the numbers in order and to tap the correct colored tile corresponding to the number, all while keeping her gaze on the chart. When advancing to the next line of numbers, the patient would often miss the first number. By looking behind the margin of the chart and remembering that each line had 5 numbers, she learned better to identify the beginning of each line. To increase difficulty as therapy progressed, the tiles were moved further apart from each other.

- **Sherman Card Sorting with R/G glasses**
  
  The patient was required to sort cards by color, by suit, and by number. The piles were purposefully spread far apart horizontally so that the patient would visually have to attend to stimuli to her left. Initially, the patient tended to ignore the piles to her left but improved as therapy progressed. The patient was consistently able to complete the activity without any suppression.

- **Walking Rail**
  
  The patient was instructed to walk forwards and backwards on the walking rail while observing her own movements. Initially, the patient had a tendency to lean towards the right with her left foot consistently touching the center rail. As the patient became more aware of her behavior, she was able to adjust to walk in a straight path.

- **CPT Pegboard**
  
  Two images of pegboards were projected onto the wall. The pegboard on the left contained a series of various colored marbles arranged in a shape. The pegboard on the right was empty. The patient was instructed to copy the pattern from the left onto the right pegboard one marble at a time. Eventually, the shapes became more complex. Another variation involved the patient reproducing the patterns as if it had been turned another direction (right, left, upside down, or side-to-side).

Results

As therapy progressed, the patient became more aware of her remaining peripheral vision. She used visual cues such as looking for the margin to avoid skipping the beginning of new lines. Initially, she felt she had to turn her whole body to see objects to her left. She next learned to turn just her head and eventually became comfortable with scanning with her eyes alone. Her daughter reported improved gait when navigating new surroundings which led to a decrease in accidental injuries. After twenty sessions, she began to resume normal activities, such as cooking and gardening, with which she had experienced difficulty prior to beginning therapy. Due to the improvements seen in the initial 20 sessions, the patient decided to continue weekly therapy to make further progress.

Discussion

This case shows the benefits of therapy following homonymous hemianopsia. While the therapy did not eliminate the visual field loss, the patient was better equipped to cope with it. Therapy allowed her to adjust to her new usable field and to feel more comfortable with everyday activities. Therapy should be considered as a viable alternative to prisms for patients with homonymous hemianopsias.