Australian Orthoptic Journal 1986; 23: 17-19

VISUAL RESPONSES OF PATIENTS WITH ECCENTRIC VIEWING

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Abstract

Three case studies are presented as examples of unusual visual response during eccentric viewing training. Two cases present problems with localisation, the third with ocular dominance. None of these problems proved to be a barrier to eccentric viewing.

Key words: *Eccentric viewing, retinal projection, visual localisation, ocular dominance.*

The relative localisation of the observer in relation to the environment is a function of normal binocular single vision. The fovea has straight ahead visual direction and is the primary point of reference. The remaining retina consists of a series of points which have functional correspondence with points of the contralateral retina. When pathology prevents the use of the fovea for fixation forcing the use of a peripheral retinal point, changes in retinal projection and or localisation may reasonably be expected.[1]

Ocular dominance is a visual phenomena which has been studied in relation to dyslexia,[2] occlusion therapy[3] and as an aetiological factor in some orthoptic problems. Fowler and Stein[4] discuss the barrier created by ocular dominance when a child is forced to use the non-dominant eye or where ocular dominance is not established. Amphlett's research indicates occlusion of the dominant eye does not prevent improvement in the visual acuity of the non-dominant eye when treating amblyopia. Does ocular dominance effect eccentric viewing when visual acuity is not equal?

The effect of eccentric viewing training on retinal projection or visual localisation has not been widely studied. The effect of ocular dominance on eccentric viewing is equally sparse in report.

Two cases of localisation in relation to eccentric viewing and one case of a problem of ocular dominance and eccentric viewing will be discussed.

CASES

Case I

35 year old male
Diagnosis: probably a form of Bull's eye dystrophy.
V.A R 1/12 L 2/24
BEO N32
FIELD: Bilateral central scotoma

Bilateral viewing position, dextro depression.

To gain maximum benefit from his residual vision Case 1 needs to establish an eccentric viewing point on his lower temporal retina of the right eye and a lower nasal point with the left eye. This is achieved by placing the eyes in a position of dextrodepression. If normal projection is present, the stimulation of these two

Reprints from: School of Orthoptics, Lincoln Inst. of Health Sciences, 625 Swanston Street, Carlton, Victoria 3053.

retinal points will result in a localisation of the object in the upper field. The print used as a stimulus in the eccentric viewing training will therefore appear above and to the left of their actual position in space. This sensation of indirect localisation was observed by the patient and found to be most distracting. The problem was not overcome but once the patient understood the reason for his confusion in localisation, he was able to concentrate on eccentric viewing and ignore the indirect localisation.

This case illustrates the importance of understanding the underlying condition and developing communication in the successful management of these patients.

Case II
21 year old female
V.A R 3/18 L 3/18
BEO N36
FIELD: Bilateral central scotoma
SYNOPT.: Obj. FR & L — 10° (Obj. & Subj.)

After image: 

Eccentric viewing position dextroversion.

This young patient had already established an eccentric viewing point prior to training. However, she was unable to determine when her eyes were in the primary position. The aim of training was to modify the currently used eccentric viewing point to improve visual acuity and to assist the patient to reach primary position at will. Whilst viewing eccentrically in dextroversion, the patient thought her eyes to be in primary position. The eccentric viewing training required her to place her eyes in primary position then look into the selected position of gaze. However, this patient was unable to place her eyes into primary position without specific directional instructions. The question arose, was this due to a change in retinal projection?

To determine the state of retinal correspondence, the patient underwent a Bagolini lens test. There was no response as the light did not provide sufficient stimulus. The synoptophore was tried, the results indicated normal retinal correspondence. The after image test was performed as the cross provided a stimulus which could be localised despite the central field loss. This test also indicated normal retinal correspondence. (However, the unreliability of this test is noted.) The patient was able to correctly localise objects in the visual field. It would appear that retinal correspondence and localisation had not been altered. The patient was therefore instructed to move her eyes into laevoversion and hence attain primary position.

Case III
66 year old male
Diagnosis: Angioid streaks with associated macular and peripheral scarring. Glaucoma, which is controlled.
No evidence of glaucomatous field defect.
V.A R 1/6 L 1/6
BEO 6/36 pt.
BEO N 80.
FIELD: Bilateral central scotoma
Eccentric viewing dextroversion RE.
Laevoversion LE
Laevoversion provided the better prognosis for V.A
Ocular dominance of RE

This patient faced a dilemma of eccentric viewing. The patient demonstrated right dominance in right handedness and preferred the right eye for uniocular viewing. Macular lesions were more extensive in the right eye leaving the left eye with the better visual prognosis.

The most viable area of retina for eccentric viewing in the right eye is dextroversion, whereas laevoversion is preferable for the left eye. Therefore, to obtain maximum vision, the patient should use the left eye in laevoversion. Initially the patient was unable to do this and persisted in using the right eye in dextroversion. Occlusion of the right eye was instituted during training. Over a period of four to five weeks this technique proved to be successful and the patient was able to use his left eye in laevoversion. Reading accuracy improved with the change in eccentric viewing position.

CONCLUSION

Three cases are presented.

Case I, where eccentric viewing with the retention of normal retinal projection resulted in the sensation of indirect localisation when viewing a printed stimulus. This was a distraction to eccentric viewing but was not an insurmountable problem.

Case II, where an eccentric viewing point appeared to have taken on the straight ahead visual projection. Further testing indicated normal retinal correspondence and the patient was able to accurately localise objects in space. This appears to be an acceptance of ocular position without change to retinal function.

Case III. Ocular dominance initially prevented the use of the better eye for eccentric viewing. Total occlusion of the dominant eye in the early stages of training allowed the use of the better eye. Once eccentric viewing was established with this eye there was no further problem.

The most effective use of residual vision can be influenced by many factors. The above examples indicate the need for further study in the area of retinal physiology to gain more complete understanding of visual retraining.

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