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Abstract

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The Use of Visual Training to Supplement
Lens Therapy in a Binocularity Problem

by
Vern J. Sondgeroth

1952

Submitted to the faculty of the College of
Optometry Pacific University April 25, 1952
in partial fulfillment of the requirements
for a Doctor of Optometry degree.

54631

CASE HISTORY

Male patient, 16 years old, is a very quiet individual and it was necessary to do a great deal of questioning before complete case history was obtained. The chief complaint in patients own language was as follows:

"I see double when looking at distant objects." Asking if he had any further complaint, the reply was "No."

On further questioning it was disclosed that patient experienced diplopia when wearing his glasses, but more frequently when he was participating in sports and not wearing the Rx. The doubling would occur perhaps two or three times during the course of a basketball game. Doubling would be experienced when trying to fixate upon a relatively small object, such as a basketball in motion. This difficulty has troubled the patient for a period of approximately six months, becoming more frequent the past few months. Upon further questioning it was determined that patient experienced diplopia during periods of fatigue.

Harvey is in his second year of high school, doing farm work after school and during summer vacation. It does not bother his eyes to do school work, but he dislikes studying and prefers farm work.

HEALTH HISTORY

Ocular examination - Visual examination was received in Portland three years ago, and full time lenses were prescribed at that time. Patient has been wearing these lenses comfortably.

Medical examination - Last medical examination was given in September 1951 with no physical defects reported. Examination in order to participate in sports.

Dental examination - Teeth are reported in good condition. Annual dental examination and necessary treatment.

Additional History - Physical appearance is good. No systemic disturbances evident or reported. Usual childhood diseases. No serious consequences.

PRELIMINARY FINDINGS

External Examination - All external structures were free of apparent pathology. The sclera, lid margins, conjunctiva were clear and uninjected. No opacities, ulceration or dystrophy of cornea were evident. Lacrimal drainage adequate. Equal finger tension of OD and OS.

Pupillary Reactions - The pupil size was equal, measuring 5mm under medium illumination. The consensual and near point reflex was instantaneous, and remained as long as light stimulus or near point object was present.

Ophthalmoscopic Examination - All structures under observation with the ophthalmoscope appeared to be free of pathology. The expected physiological cupping was present, with a vessel ratio of 3:2. The lens, cornea, vitreous and iris were free of opacities. Fundus color was of reddish-orange. Disk margin was well defined, partial choroidal ring.

ANALYSIS AND DISGNOSIS

The analytical of H.V. shows a picture of a B₂, with a low tolerance for base-in prism as measured in the blur findings and ductions at far and near. It is immediately noted that a major distortion is present in the base-in ductions of #11 and #17B, and the base-in to blur finding of 17A.

The base-out to blur (#9, #16A) are extremely high, whereas the response to base-out in the #10, #16B fall close to the OEP norm. Also of significance is the measurable esophoria throughout the entire analytical. Additional plus over the #7A and habitual, shows only a small transference into lesser esophoria. Phoria's through plus of the fused and dissociated cross cylinder measured low exophoria.

Amplitude of accommodation is very low for an individual 16 years of age, and the minus to blur-out of #20 is also far below the OEP expected. Entrance acuity was a good 20/20 for the near and far point through patients present prescription. Acuity was not improved through the analytical finding of 7A. Since patient does a minimum of near point work, and visual acuity being adequate, it is suggested that habitual prescription, plus 1.75 OD, plus 2.00 -50x180° OS, be retained for therapy which is to follow.

Patient's performance throughout the basic manipulatory skills was poor. Monocular and binocular skills (clockwise and counter clockwise) were erratic, especially in the temporal quadrants. After clinician gave less than a dozen rotations, eye movements became progressively worse, indicating an inability to sustain performance. There was a definite break down in his performance. Undershooting target and correcting, pendulum movement in horizontal meridian and head movements were present while doing the saccadic fixations and the near to far fixations.

Analyzing the visual skill performance we immediately note the poor binocularity pattern and esophoria as indicated by the three ball test, and the inability of the patient to fuse the stereopsis card at far. These tests were conducted by use of the Betts Battery of visual skill cards. Cover test also exhibited esophoria. The Near Point of Binocularity test given in the entrance examination was recorded at eight inches. These responses further substantiate the idea that a binocular difficulty is present. Other skills which were failed were the Near and Far Point Visual Discrimination, and the inhibitory and stimulatory phase of the accommodative rock. All the other tests included in the Betts Battery of skills were considered as passing. The skills which were failed did not show improvement through additional plus sphere.

This case appears to be of a disorganized nature according to the OEP syndrome. Disorganized because of the low recoveries throughout the duction findings along with the low #19, #20. Although this patient would probably accept a lens of greater or lesser dioptric power, it would not be the solution to the existing problem. It was also evident that lenses would not aid the patient in his visual skill performance.

PROGRESS REPORT #1

The first progress report was conducted after a period of thirty days from the commencing of visual training therapy.

Patient still professed to be experiencing the doubling affect at far, although he thought that it was less frequent than previously.

Analytical findings were not encouraging, for the movement in the desired direction was only slight. There was, however, a favorable decrease in the #9 of four prism diopters, and a slight increase of the 17B.

In view of the fact that findings have not been altered an appreciable amount, training of preliminary nature was continued rather than advancement to more difficult areas of peripheral and central stereopsis material.

PROGRESS REPORT #2

Progress report number two was taken after an additional four week training period following progress report number one. Diplopia was still bothering the patient, but at this time he was confident that it was less frequent, and felt that he was improving.

The phoria picture shows a splendid movement into lesser esophoria, and a marked exophoria in the 13B, 15A, 15B for the first time. Base-in ductions and base-in to blurs have also made a slight movement in the desired direction. The #20 and #21 have been driven into much better equilibrium, and the #19 has increased by -1.25 diopters.

Approximately two weeks after the second progress report was the last time patient complained of diplopia.

COMMENT

Although the patient still possesses a distortion in his visual pattern the case may be considered successful from the stand point of the complaint. The diplopia has completely vanished through the administering of visual training, and it is believed that this comfort will ensue throughout the future. It is advised, however, that H. V. have a periodical visual examination, to guard against a regression to his old habit pattern of seeing. If deterioration is again occurring, visual training should be instigated immediately.

The clinician feels that he has received valuable experience by handling this case, and now takes the liberty to formulate several conclusions that may be helpful to other beginners in the field of visual training.

When confronted with a problem as is presented in this writing, there are several pitfalls which must be avoided, and certain procedures which must be adhered to.

First: Ample time, repetition and patience must be illicited throughout the entire procedure.

Second: The forcing of the deviating function in an attempt to gain a speedy recovery, must be avoided.

Third: Encourage the patient to learn what is meant by far point projection while working from near field to far field.

Fourth: This esophoric hyperope responded favorably through a training sequence which employed the use of minus and base-in. Begin training through minus after a high degree of binocularity has been maintained.

SUMMARY

H. V., male, age 16, was admitted to the optometric clinic COPU in November 1951, complaining of doubling at far. The case was diagnosed as one of binocular difficulty at far resulting in esophoria, and an inability to maintain a sustained visual performance.

Acuity, phorias and ductions were not affected through a variation of lens power. It was, therefore, necessary to resort to visual training therapy.

The clinician utilized a program of Manipulatory Skills, Preliminary Binocularity Performance, and Central Binocularity training, which brought about a reconditioning in the distortion founded in the analytical and visual skills.

OPTOMETRIC FINDINGS*	Nov. '51	Feb '52	March '52
2 Ophthalmometer: O.D.	-50x180°	-50x180°	-50x180°
O.S.	-75x180°	-50x180°	-50x180°
**3 Lat ph thru hab Rx	10Eso	10 Eso	5 Eso
13A Lat ph at 16" thru hab Rx	8Eso	6 Eso	Ortho
4 "Static" retinoscopy O.D.	2.25-25x180	2.25-25x180	2.00
O.S.	2.75-75x180	2.50-75x180	2.25-50x180
5 "Dynamic" retinoscopy O.D.	3.50-25x180	3.50-25x180	3.50
at 20" O.S.	4.00-75x180	4.25-75x180	3.75-50x180
6 "Dynamic" retinoscopy O.D.	2.75-25x180	2.50-25x180	2.75
at 40" O.S.	3.25-75x180	2.75-75x180	3.25-50x180
7 Subjective to 20/20 O.D.	2.50	2.75-50x180	2.50-25x180
O.S.	2.75-50x180	3.00-50x180	2.75-75x180
7A Subjective to best O.D.	2.25	2.00-50x180	1.75-25x180
visual acuity O.S.	2.50-50x180	2.25-50x180	2.00-75x180
8 Lat ph thru #7	10 Eso	10 Eso	2 Eso
9 B O to blur thru #7	18	14	7
10 B O break & recover thru #7	24/8	24/10	22/12
11 B I break & recover thru #7	5/-1	6/0	7/5
12 Vert ph thru #7	Ortho	Ortho	Ortho
12 Vert ductions thru #7	3/1 3/1	3/1 3/1	3/1 3/1
13B Lat ph at 16" thru	6 Eso	6 Eso	4 Xo
14A Diss cross O.D.	3.75	4.00-50x180	4.25 -25x180
cylinder at 16" O.S.	4.00-50x180	4.00-50x180	4.25-50x180
15A Lat ph thru 14A	2X0	3X0	6X0
14B Binoc cross O.D.	3.75	4.00-25x180	4.25-50x180
cylinder at 16" O.S.	4.00-50x180	4.00-50x180	4.25-50x180
15B Lat ph thru #14B	4X0	3X0	8X0
16A B O blur out 16" thru #7	X	X	X
16B B O break and recover thru #7	24/19	17/12	22/10
17A B I blur out thru #7	0	2	9
17B B I break & recover 16" thru	8/1	8/0	14/5
18 Vert ph 16" thru #7	Ortho	Ortho	Ortho
18 Vert ductions 16" thru #7	4/0 4/0	4/0 4/0	4/0 4/0
19 Minus to blur 13" O.D.	-4.25	-4.50	-5.50
O.S.	-4.50	-4.50	-5.75
O.U.	-4.50	-4.50	-5.50
20 Minus to blur out 16"	-1.00	-.75	-2.00
20 Lat ph 16" thru #7	3.50	3.50	3.00
21 Plus to blur out 16"			
21 Lat ph 16" thru			

* The numbers shown are the numerical designations for the indicated tests as adopted by the Optometric Extension Program.

TABLE II
SUMMARY OF Perceptual Skills

Nov. 1951 Feb 1952 March 1952

Techniques or Skills	Dates Given					
	P	F	P	F	P	F
Accomm Rock		✓		✓	✓	
Simultaneous Perception	✓		✓		✓	
Far Point Binocularity		✓		✓	✓	
Far-Point Stereopsis		✓		✓	✓	
Far Point Pericentral	✓		✓		✓	
Far Point Central	✓		✓		✓	
Far Point Vis. Discrim.	✓		✓		✓	
Hand & Eye Coordination	✓		✓		✓	
Color Vision	✓		✓		✓	
Far-Point Lat. Phoria	✓		✓		✓	
Far-Point Vert Phoria	✓		✓		✓	
Near-Point Vert. Phoria	✓		✓		✓	
Near-Point Binoc.	✓		✓		✓	
Near-Point Stereopsis	✓		✓		✓	
Near-Point Lat. Phoria	✓		✓		✓	
Near Point Pericentral	✓		✓		✓	
Near Point Central	✓		✓		✓	
Near Point Vis. Discrim.		✓		✓		✓

A double ruling indicates a progress report was taken at this point. See Table I.

TABLE III
SUMMARY OF Visual Training Administered

Techniques or Skills	WEEK ENDING--	Dates Given															
		Jan 22	Feb 2	Feb 16	Feb 23	Mar 1	Mar 8	Mar 15	Mar 22	Apr 8	Apr 15	Apr 22					
A. Manipulatory Skills																	
<u>Mono. Rotations</u>		X	X	X	X												
Scaddics Fixations		X	X	X	X												
Mono. & Pursuit		X	X	X	X												
Accomm. Rock:																	
<u>Stim. Inhib.</u>				X	X	X	X	X	X								
ASN rock				X	X	X	X	X	X								
Modified Upde.				X	X	X	X	X	X								
B. Preliminary Binoc.																	
<u>Movie Series</u>				X	X	X	X	X	X								
Dissociated Rota Binoc. Rota				X	X	X	X	X	X	X	X	X	X				
Binoc Lustre				X	X	X	X	X	X								
Color & Retinal Rivalry				X	X	X	X	X	X								
C. Peripheral Stereo																	
Brock Rings								X	X	X	X	X	X				
Poloroid Rings								X	X	X	X	X	X				
Pine fusion Material								X	X	X	X	X	X				
BU 9-15 Peripheral Stereopsis								X	X	X	X	X	X				
D. Central Binoc Training												X	X	X	X		
Central Rings												X	X	X	X		
Stereograms and Trans.																	
ANW 16-35								X	X	X	X	X	X	X			
AN 1-15 An 47-76												X	X	X	X		
BU 16-38 Central Stereo												X	X	X	X		
Vecto-illuminator									X	X	X	X	X	X			
BSM Material												X	X	X	X		
Hand & Eye									X	X	X	X	X	X			
Cheiroscope Jump Ductions.												X	X	X	X		

A double ruling indicates a progress report was taken at this point. See Table I.