

# ECCENTRIC FIXATION CASES CURED BY PLEOPTICS

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Treatment of eccentric fixation which is present in 5% in squint cases is still an ophthalmological problem. Folk<sup>1</sup> experience was that pleoptic treatment did not prove success in U.S.A.

Holt<sup>2</sup> comments that pleoptic treatment is generally unsatisfactory in patients:

- (1) Under 8 years old.
- (2) Who have over 4 degrees or less than one half degree of eccentric fixation.
- (3) Who have vertical eccentric fixation.
- (4) Who are very high myopes even with contact lenses.
- (5) Who have organic amblyopia.

Hamilton<sup>3</sup> discussing the advisability of pleoptic therapy expressed the idea that as to maintain the gains of pleoptic therapy, it is necessary to attain fusion or alternation. The chances of attaining fusion are only 10%. Von Noorden and Lipsius<sup>4</sup> showed their experiences with pleoptics in 58 patients with strabismus amblyopia showing that peripheral eccentric fixation has an extremely unfavourable prognosis.

Von Noorden<sup>5</sup> studied occlusion therapy in amblyopia with eccentric fixation and concluded that:

- (1) Conventional occlusion of the sound eye proved the most effective therapy particularly in younger children.
- (2) Inverse occlusion was less effective in improving visual acuity or fixation but may be useful in older children who fail to respond to occlusion of the sound eye.
- (3) Red-filter occlusion was successfully used in children who had failed to improve after occlusion of the sound eye and inverse occlusion.

The aim of the present study is to know in cases of concomitant squint amblyopia with eccentric fixation what is the type of cases that respond to pleoptics?

#### Case reports.

The following 27 cases of concomitant squint with eccentric fixation were free of organic causes of amblyopia as corneal opacity, unilateral high myopia, congenital cataract, albinism, macular degeneration or central choroiditis. There was no history of trauma, as birth trauma or old history of corneal nebula or macular haemorrhage that disappeared by time.

The method adopted to treat eccentric fixation was as follows:

(1) Determination of type of eccentric fixation by Visuskop.

(2) Occlusion of eccentric fixing eye (inverse occlusion of Bangerter) for about 4 to 6 months until fixation became central helped by pleoptic treatment to assist foveal fixation using Cupper's <sup>6</sup> negative after-image method utilising the euthyscope. Treatment was applied morning and afternoon 6 days a week each session for 30 minutes.

(3) When fixation became central the Koordinator with Haidinger brushes was used to enhance, localize and stabilize foveal fixation.

(4) When fixation was central and vision 6/12 and angle of squint less than 15° orthoptic training was used to develop fusion. This occurred in one case.

(5) Any ocular deviation larger than 15° after attaining central fixation was treated surgically (Schlossman) <sup>7</sup> at the end of study the effect of pleoptics on eccentric fixation was classified as follows:

1. Concomitant convergent squint since childhood.

(a) Cases where fixation became central (table I)

## PLEOPTICS

I Cases with eccentric fixation on horizontal meridian about one disc diameter nasal to optic disc.

II Cases with eccentric fixation on horizontal meridian in between optic disc and macula.

(b) Cases where eccentric fixation did not change its position after pleoptics.

I Vertical eccentric fixation and temporal eccentric fixation (table II)

II Ocular nystagmus (table III).

2. Concomitant divergent squint since childhood.

(a) Cases where fixation became central.

2 cases of eccentric fixation on horizontal meridian about, one disc diameter temporal to the fovea (table IV).

(b) Cases where eccentric fixation did not change its position after pleoptics (table V).

I Vertical eccentric fixation and nasal eccentric fixation.

II Ocular nystagmus.

## COMMENT

The effect of pleoptics in treating eccentric fixation in cases of concomitant squint can be classified to 2 groups:

(1) Cases that change position of eccentric fixation towards the macula. This occurs in cases of eccentric fixation on horizontal meridian as macula in cases of:

a) Convergent squint with eccentric fixation in.

b) Divergent squint with eccentric fixation out.

(2) Cases that do not change position of eccentric fixation as:

a) Cases of convergent squint with eccentric fixation out.

b) Cases of divergent squint with eccentric fixation in.

c) Vertical eccentric fixation as above or below macula or optic disc.

d) Cases of ocular nystagmus.

TABLE I

Cases where fixation became central after pleoptics.

I — Cases with eccentric fixation on horizontal meridian about one disc diameter nasal to optic disc.

Case No	Age in yrs & sex	Squint side & degree	Refraction		Corrected visual acuity		Time occlusion of amblyopic eye and pleoptics to attain central fixation.	Corrected visual acuity in amblyopic eye after central fixation	Results of orthoptics (one case)
			R	L	R	L			
1	8 M.	R. 25°	+2	+2	1/60	6/6	4 months	6/60	binocular vision.
2	8 F.	R. 20°	+2	+1	2/60	6/6	6 months	6/9	
3	9 M.	R. 30°	-2	-2	1/60	6/12	7 months	6/60	
4	9 M.	L. 35°	plane	+2cyl ax 180	6/9	1/60	4 months	6/36	
5	10 F.	R. 15°	+6	+2	2/60	6/6	6 months	6/60	
6	10 F.	L. 20°	plane	+1	6/6	2/60	8 months	6/24	

II — Cases with eccentric fixation on horizontal meridian in between optic disc and macula.

7	6 M.	R. 25°	+2	+1	1/60	6/6	3 months	6/18
8	7 M.	R. 20°	+4	+2	1/60	6/6	5 months	6/60
9	8 F.	L. 30°	plane	+2	6/6	2/60	6 months	6/24
10	9 F.	L. 15°	+1	+2	6/6	1/60	4 months	6/36

TABLE II

*Cases where eccentric fixation did not change its position after pleoptics*

*I — Vertical eccentric fixation and temporal eccentric fixation.*

Case No	Age in yrs & sex	Squint side & degree	Refraction		Corrected visual acuity		Site of eccentric fixation before and after pleoptics
			R	L	R	L	
11	10 M.	L. 40°	plane	plane	6/6	1/60	¼ disc diameter above macula
12	11 M.	R. 35°	+2	+1	2/60	6/9	¼ disc diameter above optic disc.
13	11 F.	L. 45°	plane	+1	6/9	1/60	one disc diameter temporal to macula.

TABLE III

*II — Ocular nystagmus (unilateral horizontal nystagmus).*

14	8 M.	R. 30°	-2	-1	6/60	6/6	5° around macula
15	8 M.	R. 15°	+1+1 cyl 90	+1+1 cyl 90	1/60	6/9	" "
16	9 M.	L. 25°	plane	plane	6/6	2/60	" "
17	9 F.	L. 20°	+1	+1	6/6	2/60	" "
18	10 F.	L. 35°	plane	-3 cyl 10	6/9	1/60	" "
19	11 M.	R. 30°	+1	plane	4/60	6/12	between macula and optic disc
20	12 F.	R. 20°	+1	+1+1 cyl 20	3/60	6/9	Just nasal to optic disc.

TABLE IV

*Cases where fixation became central after pleoptics.*

*I — Cases of eccentric fixation on horizontal meridian about one disc diameter.*

*Temporal to forea*

Case No	Age in yrs & sex	Squint s'de & degree	Refraction		Corrected visual acuity		Time occlusion of amblyopic eye and pleoptics to attain central fixation	Corrected visual acuity in amblyopic eye after central fixation
			R	L	R	L		
21	7 M.	R. 30°	-1	plane	5/60	6/6	5 months	6/36
22	9 M.	L. 25°	+1	-2	6/6	3/60	6 months	6/24

TABLE V

*II — Cases where eccentric fixation did not change its position after pleoptics.*

Case No	Age in yrs & sex	Squint s'de & degree	Refraction		Corrected visual acuity		Site of eccentric fixation before and after pleoptics
			R	L	R	L	
23	8 M.	L. 20°	plane	+3	6/6	1/60	between optic disc and macula.
24	9 F.	R. 30°	-3	+1	1/60	6/12	One disc diameter nasal to optic disc.
25	10 F.	R. 25°	-5	plane	3/60	6/12	¼ disc diameter above optic disc.
26	12 F.	R. 15°	+1	-3-1 cyl 90	1/60	6/9	¼ disc diameter above macula.
27	14 M.	R. 40°	-4	-1	1/60	6/12	Unilateral horizontal nystagmus around macula.

In the first group the cause of eccentric fixation is most probably an extra-ocular muscles motor factor as suggested by Von Noorden and Mackenson<sup>8</sup>. This is favoured by:

a) In children under the age of 4, regular occlusion of the good eye may bring about central fixation of the untrically fixing eye and improvement in vision without other treatment. The ophthalmologist must keep close check on the fixation lest by such methods he only reinforces pseudo-foveal fixation (Costenbader Albert and Hiatt)<sup>9</sup>.

b) Toselli and Bertoncini<sup>10</sup> found that after unsuccessful pleoptic therapy, surgical realignment favorably influence a return to centric fixation and improved visual acuity.

c) Mortada<sup>11</sup> found that in concomitant squint amblyopia with eccentric fixation on the horizontal meridian nasal to the macula in cases of convergent squint or temporal in divergent squint, fixation could be treated by surgical correction of the squint followed by declusion of the fixing eye. In these cases fixation in amblyopic eye became central with improvement in visual acuity.

In the second group the cause of eccentric fixation is most probably a central scotoma as suggested by Bangerter<sup>12</sup> Oppel<sup>13</sup> and others.

## SUMMARY

(1) Pleoptics cures cases of concomitant squint amblyopia with eccentric fixation on the horizontal meridian.

- a) nasal to the macula in cases of convergent squint and
- b) temporal to the macula in cases of divergent squint.

(2) Pleoptics does not change position of eccentric fixation in cases of:

- a) Vertical eccentric fixation.
- b) Convergent squint with eccentric fixation out.
- c) Divergent squint with eccentric fixation in.
- d) Ocular nystagmus.

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