

ORTHOPTIC TREATMENT IN TWELVE CASES OF ECCENTRIC FIXATION

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Abstract

The results of treatment by occlusion and the Cam Stimulator in 12 cases of eccentric fixation were studied. Inverse occlusion disrupted fixation in all convergent deviations within 3 months and its effect on visual acuity was varied. Mixed and direct occlusion improved both visual acuity and fixation pattern in most patients.

Key words

Eccentric fixation, occlusion, Cam Stimulator.

Aim

The aim of this paper is to:

- 1) study the methods and the results of orthoptic treatment in twelve cases of eccentric fixation.
- 2) examine the individual forms of treatment, especially inverse occlusion and direct occlusion. Also to briefly examine mixed occlusion, including red filter treatment, gradual fixing eye occlusion and the Cam stimulator.
- 3) see the effects of each major form of treatment on visual acuity and the fixation pattern
- 4) observe the effects of age and co-operation on treatment
- 5) evaluate the degree of improvement in visual acuity and fixation in each patient.

Eccentric fixation: a unioocular condition in which there is fixation of an object by an area other than the fovea. The area adopts principal visual direction, except in eccentric viewing, where the fovea maintains straight ahead projection.

Selection of patients

- 1) Patients treated by both inverse and direct occlusion were chosen
- 2) Patients of varying ages were selected
- 3) Completed cases were preferred, but this was not always possible and several patients used here are still continuing treatment

- 4) Personal participation was limited since most treatment was extended over months and sometimes years. Information gained was therefore predominantly from orthoptic records.

Methods

Each orthoptic record was examined for:

1. Age at first visit
2. Sex
3. Type of deviation and size
4. Initial and final fixation
5. Initial and final V.A.

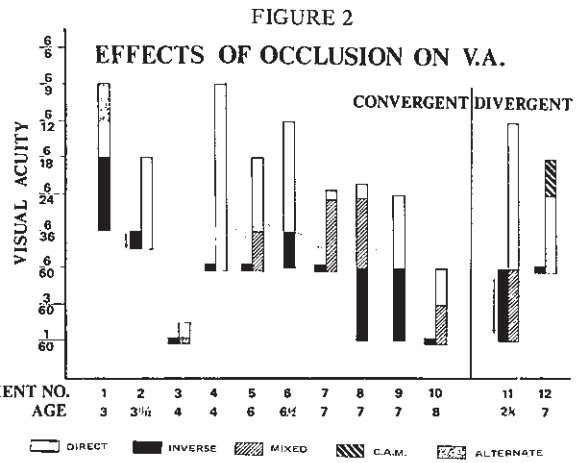
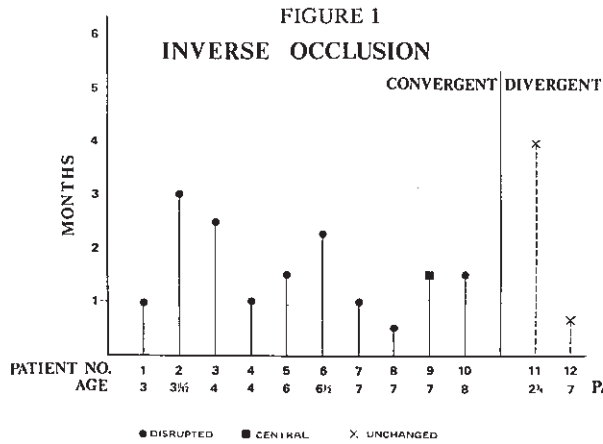
The full treatment was recorded, including the type of occlusion and the duration of treatment.

The results of treatment were recorded in terms of fixation and visual acuity. The onset of the condition could not be recorded due to inadequate information. The area of fixation was recorded in the usual terms of central, parafoveal, paramacular and peripheral fixation. Fixation was recorded as steady, unsteady, or wavering.

The area of fixation could be:

- 1) congruous and correspond to the direction of the deviation, i.e. nasal in a convergent deviation and temporal in a divergent deviation
- 2) paradoxical, i.e. nasal point used in a divergent deviation.

In Figure 1 the twelve responses to inverse occlusion are plotted in relation to time.



This fig. shows that:

1. One patient assumed central fixation, nine patients showed disrupted fixation patterns, and in two the area used for fixation remained unchanged.

Inverse occlusion was effective in breaking down the fixation pattern in 10 out of 12 cases. All convergent deviations responded well to inverse occlusion, whereas the two divergent deviations failed to respond.

2. The results were evident in 3 months or less, supporting the views of Duke Elder¹ and Lyle and Wybar² that three months is long enough to ascertain the effects of inverse occlusion.
3. Age did not seem to influence the response to inverse occlusion. The only patient to achieve central fixation being 7 years old. However it is difficult to draw conclusions without additional data concerning onset of the condition.

Mixed Occlusion

Mixed or gradual fixing eye occlusion was used in this study in several instances. It is an intermediate step between inverse and direct occlusion.

The functions of mixed occlusion are:

1. To allow fixation to become central and steady
2. To gradually prepare the patient for direct occlusion
3. To avoid the danger and inconvenience of direct occlusion where V.A. is too poor.
4. To improve V.A.

Figure 2 shows the cumulative effect of each type of occlusion, i.e. INVERSE, MIXED and DIRECT on the visual acuity of each patient.

This fig. shows that:

1. The V.A. improved with inverse occlusion in

four cases, remained unchanged in six cases and worsened in two cases. The effects of inverse occlusion on V.A. are therefore varied.

2. Mixed occlusion was successful in improving V.A. where the patient was cooperative. Patient 3 was not cooperative and showed no improvement with mixed occlusion.
3. Direct occlusion improved V.A. in all cases.
4. Alternate occlusion — used in Case 1 following direct occlusion improved V.A.
5. In Case 12 the Cam stimulator improved V.A. following direct occlusion.

The effects of mixed and direct occlusion on fixation followed a pattern similar to that found in V.A. improvement.

Mixed occlusion improved fixation slightly in all cases where the patient was co-operative.

Direct occlusion improved fixation in 10 patients, four of these assuming central fixation. In one patient the fixation pattern remained unchanged and fixation in one patient became further eccentric.

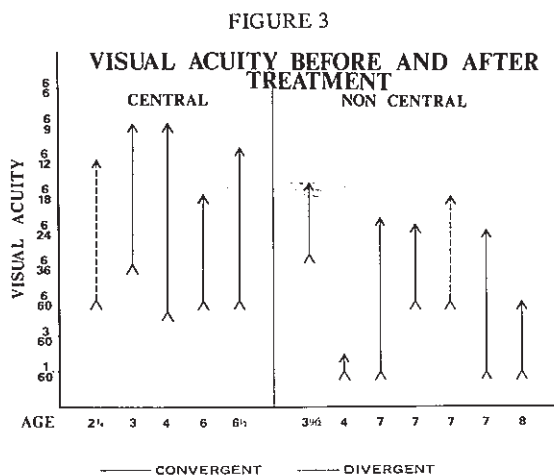
Alternating occlusion achieved central fixation in Case 1.

Case 11, a divergent deviation, assumed central fixation with direct occlusion, whereas inverse occlusion had been unsuccessful. Patient 12, divergent also, showed a very slight improvement in fixation after two sessions on the Cam Stimulator.

Figure 3 represents the improvement in V.A. in cases of central and non central fixation. The lower point represents initial VA and the higher one final VA.

The fig. shows that:

1. V.A. improved in all cases. All patients commenced with 6/36 or worse vision and improved to 6/24 or better, except two.



2. V.A. achieved by central fixation was generally better than that of non central fixation.
3. Age showed little effect on results obtained in central fixation. Age did seem to reduce the efficacy of treatment in non central fixation.
4. The two cases with divergent deviation showed differing results. Case 11 assumed central fixation and improved in V.A. by 4 lines from 6/60 to 6/12. Case 12 did not take up central fixation, but showed an improvement in V.A. of 3 lines from 6/60 to 6/18.

CONCLUSION

1. Inverse Occlusion

- 1) In this study, inverse occlusion has been shown to be useful in disrupting the eccentric fixation pattern in convergent squint only — these numbering 10 out of 12 cases studied.
- 2) The results of inverse occlusion were evident in 3 months or less and therefore longer periods of occlusion may not be necessary.
- 3) Age did not seem to affect the results of

treatment by inverse occlusion. Ages ranged from 2 1/2 to 8 years of age, with a seven year old achieving central fixation. This form of treatment should therefore, according to this study, not be withheld on the grounds of age alone.

- 4) The effect of inverse occlusion on V.A. was variable with 4 cases showing an improvement. However, the main function of inverse occlusion is not to improve V.A., but to disrupt the pattern of eccentric fixation.
2. Mixed occlusion, although not used in all cases, showed improvement in both fixation pattern, and in V.A., in co-operative patients.
3. Direct occlusion was most effective in improving V.A. in every case. Fixation also improved in 10 out of 12 patients and 4 of these assumed central fixation.
4. General
 - 1) An overall improvement was evident in all patients except one. Visual acuity initially was 6/36 or worse and improved to at least 6/24 or better in all except two patients.
 - 2) Age seemed to decrease improvement in V.A. in cases of non-disruptable eccentric fixation.

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REFERENCES

1. DUKE-ELDER, SIR STEWART. "Systems of Ophthalmology" Vol. 4 Ocular Motility and Strabismus. Henry Kimpton, London, 1973. p. 208, p. 429.
2. LYLE, T. KEITH and WYBAR, KENNETH C. "Lyle and Jackson's Practical Orthoptics in the Treatment of Squint" 5th Ed. H.K. Lewis and Co Ltd London, 1970 p. 271.