

ANOMALIES OF FIXATION

Abnormal Retinal Correspondence (A.R.C.)

This is a binocular condition in which the fovea of the fixing eye is used in conjunction with a point other than the fovea of the deviating eye in such a way that they both have the same visual direction. A.R.C. develops in certain cases of long-standing constant squint as a sensory adaptation to the abnormal alignment of the visual axes. After suppression occurs, A.R.C. is developed to obtain a subnormal form of binocular vision. When A.R.C. is fully developed, suppression no longer exists. In A.R.C. the subjective and objective measurements of the deviation are not the same and the difference between the two is the *angle of anomaly*.

There are two types of A.R.C. (Fig. 1):

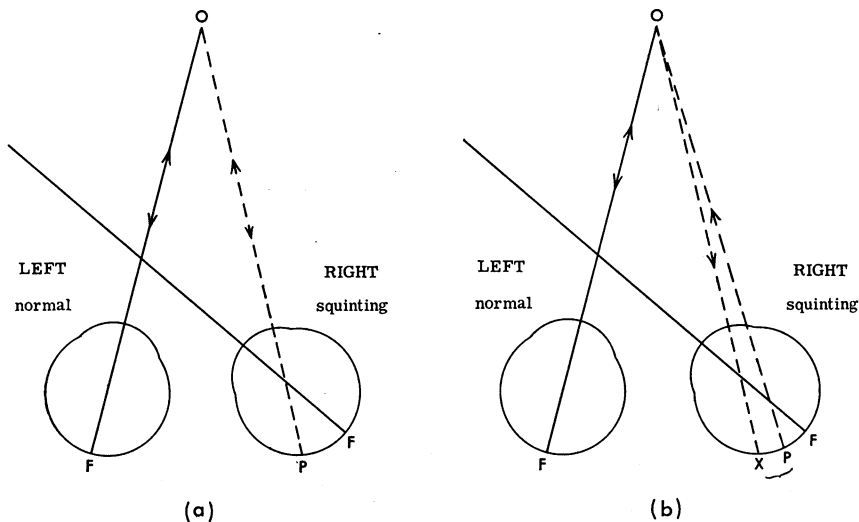


FIG. 1.—Abnormal retinal correspondence. (a) Harmonious. The angle of anomaly is equal to the angle of squint and the subjective angle is zero. (b) Unharmonious. The angle of anomaly is less than the angle of squint, the subjective angle being between zero and the objective measurement. O, fixation object; F, fovea; P, point having same visual direction as fovea of fixing eye; X, point receiving image of fixation object.

(1) Harmonious A.R.C. is a useful adaptation to the presence of a squint, gaining for the patient a modified form of binocularity.

(2) Unharmonious A.R.C. is a less valuable condition that may be a stage in the development of harmonious A.R.C., or may be an artefact created by the abnormal conditions of testing.

A.R.C. is diagnosed either by comparing the subjective and objective measurements of the deviation, or by comparing the simultaneous projection of each fovea.

In a squint of small deviation, firmly established A.R.C. should not be treated, as restoration of normal retinal correspondence rarely results in binocular single vision. Indeed, harmonious A.R.C., if associated with fusion and low-grade stereopsis, has a definite functional value.

Fixation Disparity

This is a condition in which there is a lack of bifoveal fixation in binocular single vision (B.S.V.), occurring normally in heterophoria when an eye deviates fractionally from the parallel position (Fig. 2). B.S.V. is maintained because the disparate retinal image still lies within Panum's fusional area. The deviation is less than 1° and is too small to be detected by the cover test. Ogle, Mussey, and Prangen (1949) demonstrated it in all cases of heterophoria by using special slides.

The term "fixation disparity" is also used by some orthoptists for a small manifest convergent squint associated with an esophoria. The visual acuity of the deviating eye is slightly defective and a small suppression scotoma prevents bifoveal fixation. A good range of fusion and stereopsis is maintained, and as a small angle of anomaly is usually found, these patients really have A.R.C.

Fixation disparity requires no treatment, but if the associated heterophoria becomes decompensated this should be treated in the usual way.

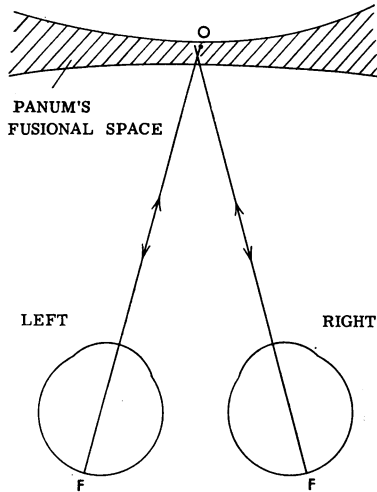


FIG. 2.—Fixation disparity.

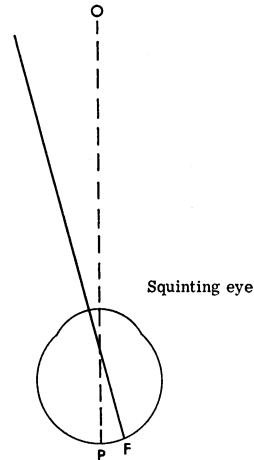


FIG. 3.—Eccentric fixation. O, fixation object; F, fovea; P, point of eccentric fixation.

Eccentric Fixation

This is a unocular condition in which a point other than the fovea is used for fixation (Fig. 3). It develops when the foveal visual acuity deteriorates to or below that of a peripheral retinal point. When the normally fixing eye is occluded the squinting eye either remains in the deviated position or moves to take up fixation with the (non-foveal) point of best visual acuity. The condition may be well developed with one point of fixation, or it may be developing with a variable point of fixation. In well developed eccentric fixation the visual direction of the retinal elements is changed, so that the eccentrically fixing point projects straight ahead. The change in projection occurs a considerable time after the change in fixation. If fixation is eccentric but the fovea still retains the straight-ahead projection, the patient feels that he is not looking directly at the fixing point (eccentric retinal viewing). The visuscope is the only reliable method of diagnosing eccentric fixation. The position of the star on the patient's fundus indicates the point used for fixation.

In children under the age of 7 years occlusion of the normally fixing eye frequently results in re-establishment of foveal fixation in the deviating eye, especially if fixation is unstable. This direct occlusion should be carried out first. If, after a few days, eccentric fixation still persists, the affected eye should be occluded for up to 6 months to break down the eccentric fixation. Directly fixation becomes less stable occlusion should be transferred back to the normally fixing eye. Pleoptic treatment may also be used to re-establish foveal fixation.

REFERENCE

OGLE, K., MUSSEY, F., and PRANGEN, A. DE H. (1949). *Amer. J. Ophthalm.*, **32**, 1069.

Illustrations:

INSTITUTE OF OPHTHALMOLOGY,
LONDON, W.C.1.

KATHLEEN BULLOCK,
ORTHOPTIC DEPARTMENT,
MOORFIELDS EYE HOSPITAL,
LONDON, W.C.1.