EXAMINATION OF THE CENTRAL PORTION OF THE VISUAL FIELDS AT THE BEDSIDE*

A METHOD OF INCREASED ACCURACY OF ASSESSMENT OF THE CENTRAL 30° OF VISION ON CONFRONTATION

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IN the everyday examination of the visual fields, on the ward or in the clinic, we utilize methods which are simple and relatively effective. The extent of each peripheral field is tested by finger movement, or by a coloured or white-headed pin, and the blind spot and any scotomata are similarly noted by the use of a pin. A more accurate assessment of the central fields, with respect to small scotomata, relative scotomata, depressions of mild intensity, or early quadrantic or hemianopic defect of mild intensity, is made by examination with the Bjerrum screen. It became apparent that, by the use of a specially constructed, yet simple, test object in the form of a pin, examination by confrontation could be made more sensitive and accurate, and that, leaving the requirements of documentation aside, the need of Bjerrum screen examination in diagnosis could often be obviated. A variety of defects was examined: retrobulbar neuritis, tobacco amblyopia, passive oedema of the optic disc (papilloedema), optic nerve compression, chiasmal interference, and mild intensity homonymous quadrantanopia and hemianopia; all results were checked by full, formal examination with the 2-metre screen and the perimeter, and it became apparent that with increasing experience the essential character of the defect could almost always be determined by confrontation. And in addition to scotomatous depression, any quadrantic or hemianopic depression of such mildness as to effect the 1 or 2 mm. isopter only, could be detected by confrontation.

Test Objects (Fig. 1, overleaf).—A set of targets is mounted or painted on to a pin-head of globular shape, 9 mm. in diameter, and dull black in finish, mounted on a shaft, 7–8 cm. in length, which is also of a dull surface. The targets are 1.5 and 2.5 mm. white and 3.5 mm. green and red, mounted on separate and on single pins†.

Method

(1) The peripheral fields are assessed to the moving fingers or to *movement* of the head of the pin.

(2) The blind spot is assessed by the disappearance and reappearance of the *head* of the pin in at least the vertical and horizontal axes.

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† Available from C. Davis Keeler Ltd., London.

FIG. 1.—Test Objects: Three separate pins comprise the set. The targets mounted on the far side of the pin-head are projected above. The first mounts a small and a larger white target and the second a red and green target. During the examination, any target may thus be turned out of sight in order to verify cooperation. A further test pin mounts all four targets. They can be conveniently carried behind the coat lapel.

(3) The patient, covering one eye with a card or hand, is instructed to fix upon the examiner's eye (either the right or the left, or each alternately depending upon which the examiner can keep closed with ease). The patient is shown the 1.5 or 2.5 mm. white target by bringing it in line with the fixation point. The target is then removed to about 30° from fixation, and brought in slowly, and the patient is instructed to indicate when he can see the white target. The position of this central isopter can be roughly assessed by bringing the target in, centripetally, along a radius roughly bisecting each of the quadrants. The exact position of the isopter will be determined by the lighting conditions under which the examination is done. If the 1.5 mm. is seen with difficulty, the 2.5 mm. target can be used. The isopter, under the usual conditions of ward lighting, will lie medial to the line of a concentric circle passing through the blind spot, and thus at about 10 to 15° from fixation. A suggestion of quadrantic or hemianopic depression can be verified by a fuller assessment of that sector, and by comparison with the intact sectors. This can be further verified by examination with red and/or green.

(4) The central area about fixation, and including fixation, is assessed by moving the target slowly about, radially or meridionally, and is checked by noting any wandering of the patient's eye, and having the patient report "yes", "dim", "no", as perceived. This is done with white and coloured targets as required. Cooperation can be verified at any time by turning the shaft so that the target is out of sight.

The presence of central depression (scotoma), can be difficult to verify by

screen testing in the poorly-cooperative patient, although its presence may be suspected on the basis of a diminished visual acuity. Such a defect may be best verified by this confrontation method. With the patient's eye fixed upon the examiner's, the white target is brought to the fixation point, then taken away 5° or so from fixation, and the patient is asked in which position the spot is brightest. This is checked by comparison along another radius, and then verified with the red and/or green targets. Any depression is noted by a greying, imperception, or loss of brightness or colour perception, and any failure to maintain fixation cannot escape notice. And the scotoma may be mapped with respect to its extent, density and colour involvement.

Clinical Examples

Case 1 (Fig. 2A and B).—Chiasmal interference, due either to craniopharyngioma or to meningioma. The visual acuity was less than 6/60 in the right eye, and 6/12 in the left with glasses.

FIG. 2A.—The defect is essentially bitemporal in character, absolute on the right, involving central vision, with a thin rim of preservation nasally. On the left, the temporal loss is of the mildest degree with loss of red perception and an hemianopic depression of the 1/2000 W isopter.

FIG. 2B.—Perimetric examination. There is an absolute loss of the temporal, central, and a portion of the nasal field on the right. There is a possible mild temporal depression to the 1/330 W isoper on the left.

The mild intensity hemianopic depression, involving central small isopters only, could be discerned at the bedside, using the 1.5 mm. white target, and verified with the red and green targets. The extensive predominantly temporal loss on the right, could readily be outlined with finger movement or by assessing perception to the entire head of the pin.

Case 2 (Fig. 3A and B).—Right anterior chiasmal angle syndrome due to a large paraclinoid aneurysm of the right internal carotid artery. The visual acuity was less than 6/60 in the right eye, and 6/9 in the left with glasses.

FIG. 3A.—Bjerrum screen. A central-paracentral scotoma of absolute intensity breaks through, upwards, to the periphery. A hemianopic depression is present on the left, temporally, and is more dense in the upper quadrant.

FIG. 3B.—Perimetric examination. Absolute loss of peripheral portion of temporal field on the right; the 1/300 W isopter outlines the area of depression extending into the central scotoma. On the left, the peripheral temporal loss is greatest in the upper quadrant, as is characteristic of compression of the contralateral anterior angle of the chiasma.

In the right eye, with the 2.5 mm. white target or the entire head of the pin, depending on the light circumstances, the extent of the centro-caecal scotoma could be noted, and the sharp demarcation along the vertical meridian could be distinguished. In the left

eye, the hemianopic quality was apparent with the 1.5 mm. white and to the red and green targets, and the greater depression in the upper quadrant was apparent by virtue of an imperception of the 2.5 mm. white in that quadrant.

Case 3 (Fig. 4).—Bilateral centro-caecal scotomata due to toxic amblyopia (tobacco). The visual acuity was less than 6/60 in the right eye, and 6/60 in the left, corrected.

Depending upon the lighting at the time of examination, the 2.5 mm. white or the entire head of the pin was not perceived in the scotomatous area. The horizontal alignment of the defect was apparent. A corresponding defect for red and green was noted. Fixation could be assessed throughout the examination.

The peripheral fields (not shown) were normal.

FIG 4.—Bjerrum screen. The bilateral centro-caecal scotomata are aligned along a horizontal axis, with sloping margins, an absolute core, without disproportionate loss of red.

Case 4 (Figs 5A and B, overleaf).—Left homonymous inferior quadrantanopia of mild intensity, involving the central isopters only.* The visual acuity was 6/9 in each eye, uncorrected.

This example illustrates the sensitivity of this method at the bedside. The inferior homonymous quadrantanopia was apparent with the 1.5 mm. white, and the red and green targets, and was confirmed by formal examination with the Bjerrum screen.

Summary

A method of confrontation examination of the central portion of the visual fields is described. It can be done quickly, and with experience allows of a considerable degree of accuracy. The author has found it of particular value in the demonstration of central scotomata in the poorly-cooperative patient, and in the detection of mild intensity quadrantic and hemianopic defects, where the peripheral fields are normal or near-normal.

* Possibly related to ventriculography (posterior parietal burrhole). The incidence of this possible complication of ventriculography is under investigation.

FIG. 5A.—A left homonymous quadrantanopia involves the central isopters only, with a sharp demarcation to 2/2000 W and to red perception, with a mild deflection of the 5/2000 W isopter in that quadrant.

FIG. 5B.—Perimetric examination. The peripheral and intermediate fields are normal.

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