THE RETINOPATHY IN POLYARTERITIS NODOSA*†

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OCULAR manifestations of polyarteritis nodosa are well recognized. Changes in the choroidal, ciliary, orbital, and retinal vessels have all been described (Duke-Elder and Dobree, 1967). Hitherto, the retinopathy of this condition has been described on the basis of ophthalmoscopic and pathological appearances. The technique of fluorescein fundus photography is particularly well suited to the investigation of vascular retinopathies; its application in this case shows the changes in retinal vascular structure and function which characterize the condition.

Case Report

A male Indian aged 25 years had had the diagnosis of polyarteritis confirmed by muscle biopsy. Ocular symptoms had been present for 2 weeks before the eye was photographed; at this time the corrected visual acuity in the normal eye was 6/6, and in the affected eye 6/18.

Ophthalmoscopically the left eye showed a central area of oedema above and widespread retinal and subhyaloid haemorrhages below. The upper half of the retina was much less affected than the lower half. Stereoscopic colour transparencies recorded the depth of the oedema at the posterior pole, clearly indicated the varying depths of the haemorrhages, and showed in detail the irregular arterial calibres. The fluorescein photographs show that the arteries within two disc diameters of the optic disc are of regular calibre and have a normal filling pattern. Towards the posterior pole and lateral to it with arterial dilatations and thickening, calibre irregularities are evident (Fig. 1). At all sites of structural arterial abnormality, functional abnormality is obvious. Rapid and profuse leakage of fluorescein from these arteries is demonstrated by the perivascular diffuse fluorescence (Fig. 2), which increases in intensity and area of diffusion up to a peak at 6 minutes after injection. Normally retinal vessels are impermeable to fluorescein and therefore the widespread incontinence of the retinal arteries in this case indicates their inflamed state. The main inferior retinal vein was thrombosed; there were two small inferior retinal veins and similar superior retinal veins but there was also a massive retinal vein superiorly, the filling pattern of which is clearly seen. It was fully 8 seconds after the appearance of fluorescein in the retina before complete filling of this vessel with fluorescein occurred. In contrast to the arteries no fluorescein leakage from veins was noted.

Retinal capillaries around the optic disc up to a distance of one and a half disc diameters were abnormally dilated. These changes were most evident inferiorly between the nasal and temporal branches of the inferior retinal artery. Tortuosity and aneurysmal dilations of these capillaries were striking (Fig. 4). Immediately below this zone capillary closure was associated with multiple retinal haemorrhages.

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FIG. 1.—Fluorescein angiogram of left eye—25 sec. after injection, showing arteriopathy at the posterior pole with early fluorescein leakage.

FIG. 2.—Fluorescein angiogram of left eye—1 min. after injection, showing gross arteriopathy lateral to the posterior pole.

At the posterior pole of the eye an area of oedema four disc diameters across was surrounded by haemorrhages, particularly below, where a subhyaloid haemorrhage had settled to show a horizontal upper border. The haemorrhages appear as black on the photographs in contrast to the fluorescent areas. The oedematous area showed a faint fluorescence at 6 minutes, compare Figs 1 and 3.

Comment

Photographic methods can aid our understanding of vascular retinopathies and other retinal conditions. The study of magnified stereoscopic colour transparencies of the ocular fundus especially in conjunction with fluorescein photographs can yield more information than any other clinical method of examination. Additionally the fluorescein angiograms provide dynamic evidence of retinal function.

Thus, whatever fundus condition is being investigated, the above material is obtained

FIG. 3.—Fluorescein angiogram of left eye—6 min. after injection, showing maximal leakage of fluorescein with haemorrhages contrasting black.

FIG. 4.—Fluorescein angiogram of left eye—17 sec. after injection. Note laminar flow in superior retinal vein, irregular dilatation, and tortuosity of capillaries and posterior pole oedema.

by spending a few minutes photographing the eye. This is easily achieved as a single-handed and rapid procedure as follows:

A Zeiss fundus camera is used to record colour, stereo colour, and fluorescein photographs. For colour work Kodachrome 11 is used with a flash output of 420 Joules. Stereoscopic photographs are obtained by a lateral shift of the camera between successive exposures. Care is needed in mounting the stereo pairs to ensure accurate vertical and torsional alignment. For fluorescein photography the camera has been modified by the insertion of an excitation filter Ilford Bright Spectrum Blue 622 over the 14 mm. aperture disc. With a flash output of 420 Joules, Ilford Film FP3 is used with a barrier filter Kodak KW15 placed in front of the film. This is a cheap and rapid method of converting the camera for use with a medium speed fine grain film. After aligning and focusing the camera through the blue filter, a control exposure is taken before a rapid injection of 3 ml. of 25 per cent. solution fluorescein intravenously into the antecubital vein. This allows the operator about 10 seconds to return to the camera view-finder, make any fine adjustments necessary, and take photographs at will on the appearance of fluorescein and thereafter.

FP3 can be rapidly processed in Ilford-Phentrace and rapid fixer. Printing of the FP3 negatives can be a time-consuming process, but fortunately the advent of activator stabilization techniques has solved this problem. Using an Ilfoprinter 951 and Ilfoprint R4-IP, photographic prints of optimum contrast and quality can be produced very quickly (Rosen, 1967).

Summary

The retinopathy in a case of polyarteritis nodosa is described in detail with the aid of stereoscopic colour and fluorescein fundus photographs. The value of a photographic investigation of a retinopathy is demonstrated and details are given of the techniques with their emphasis on convenience, speed of use, and the ease of single-handed operation.

REFERENCES

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