Editorial: Retinal venous obstruction

Retinal vascular occlusion disease is a significant cause of visual loss in the United Kingdom (Sorsby, 1966), and yet there is uncertainty concerning several aspects of retinal venous obstruction which represents a considerable proportion of this disease group. Three papers in this issue are concerned with this subject.

The factors which precipitate venous obstruction have yet to be precisely defined. As recently as 1965 Hayreh concluded, as a result of animal experiments, that central retinal arterial obstruction was an essential prerequisite for venous obstruction to produce the familiar clinical appearance of 'central retinal vein occlusion' (Hayreh, 1965); three years later Fujino, Curtin, and Norton (1968) indicated that this was not necessarily the case. Histopathological studies demonstrated structural changes in the retinal arteries supplying the segment affected by branch retinal occlusion (Rabino-wicz, Litman, and Michaelson, 1968), but it has been shown clinically that arterial changes occur progressively after venous obstruction rather than predating the event (Kohner and Shilling, 1976). The density of visual field loss in retinal branch vein obstruction has been adduced as evidence of coexisting retinal arterial disease (Birchall, Harris, Drance, and Begg, 1976), and yet profound atrophy of the inner retina occurs in monkeys after experimental occlusion of the retinal veins only (Hamilton, Marshall, Kohner, and Bowbyes, 1975).

McLeod and Ring (page 419) report the interesting observation of infarction of retinal ganglion cells supplied by cilio-retinal arteries in ten patients with central vein occlusion. While acknowledging that there may be several explanations for this phenomenon they conclude that there was probably pre-existing disease of the cilio-retinal supply, although there is little firm evidence to support this. It is equally possible that in some patients the cilio-retinal supply is more affected by raised retinal venous pressure than the central retinal artery supply. In central vein occlusion the peripheral resistance of the whole of the central arterial system is raised, yet this affects only a small part of the ciliary system. In patients whose cilio-retinal arteries arise from the posterior ciliary arteries near the globe or even within the choroid itself this may be particularly relevant. Blood destined for the cilio-retinal arteries may be shunted through the choroid and this may be more pronounced if there is reactive dilatation of the choroidal vessels in response to retinal ischaemia after central vein occlusion.

There is similar uncertainty concerning the changes occurring at the site of obstruction. It has been suggested by many authors that thrombosis was the cause of obstruction in the retinal vascular outflow. However, histological studies have failed to show this and have indicated that the venous lumen was compromised by the swelling of the endothelial cells and of tissue in the inner venous walls in both branch (Seitz, 1964) and central retinal vein obstruction (Klien, 1953; Klien and Olwin, 1956); focal leakage of dye into the venous wall identified during fluorescein fundus angiography is likely to be the clinical correlate of this histological change in branch vein occlusion (Clemett, 1974). In discussions concerning pathogenesis of venous occlusion, little attention has been paid to the importance of changes in constituents and physical properties of blood; the paper by Ring, Pearson, Sanders, and Wetherley-Mein (page 397) concerns this aspect. This is particularly important since venous drainage is probably never completely obstructed in retinal venous occlusive disease, but continues, through a high resistance system of a partially obstructed lumen in the principal vein or of by-pass channels. Under such circumstances blood viscosity would critically influence the importance of such obstruction to circulatory changes. By measuring whole blood and plasma viscosity they have demonstrated higher values in patients with central retinal vein occlusion than in a comparison group. This disparity was greater at low shear than at high shear rates, which, as the authors point out, may be the more relevant when considering venous flow. The full significance of this finding has yet to be appreciated, but it certainly deserves greater attention and further investigation.

It is acknowledged that the visual prognosis in retinal venous obstruction is variable, in that some patients suffer profound visual loss while others regain their sight completely. The uncertainty concerning the visual outcome poses difficult problems for the clinician when giving a prognosis to the patient. The advent of photocoagulation as a possible method of treatment of retinal venous obstruction has highlighted this defect in our knowledge. It has made it difficult to identify those patients who need treatment because of poor visual prognosis, and impossible to make even a rough
estimate of the efficacy of treatment before completing a randomized clinical trial. Ring and others (1976) have also turned their attention to the relevance of blood and plasma viscosity to the evolution of retinal vascular changes after central retinal vein obstruction. They found significantly higher values in patients who developed large areas of retinal capillary non-perfusion and therefore poor visual prognosis when compared with those who maintained good retinal capillary perfusion. Laatikainen and Kohner (page 411) present results of a prospective study by which the value of fluorescein fundus angiography has been assessed in predicting the visual prognosis of central retinal vein occlusion. Extensive capillary closure one month after the initial symptoms indicated a poor visual prognosis progressing to blindness, extensive leakage and a broken capillary arcade at the fovea indicated a low chance of recovery of visual acuity, while absence of these changes was associated with good visual outcome. Both these papers present information by which the visual prognosis may be determined more accurately in patients with central retinal vein obstruction. The current enthusiasm for photocoagulation highlights the importance of these findings which may be paramount when assessing the need for treatment and in the design of treatment trials.

References