Editorial

Natural history of epiretinal membranes

The first thing one needs to know about in considering the article by Morino and colleagues in this month's issue is the classification of collagen. The paper mentions four types, and the authors considerably give us some clues about them (see 'Material and methods'). Type I is in scars; type II is in the vitreous; type III is also found in scars, and the distinction from I is not entirely clear to me except that, paradoxically, it occurs late in scars, whereas III occurs early; and finally type IV is a component of basement membranes. As well as the collagens there are other proteins in the membranes. They give clues to glial (glial fibrillary acidic protein, GFAP), epithelial (cytokeratin), and basement membrane (laminin) elements; there is also fibronectin, which is important during healing processes. The object of the study was to analyse membranes for their proportionate content of these various elements and then see if this could be related to the 'age' of the membrane and/or the clinical type.

It will be appreciated that there are at least two distinct classes of epiretinal membranes, those associated with ordinary hole-bearing retinal detachments and those rather mysterious ones causing macular pucker. Rather as one would expect, the latter type do not contain pigment epithelial cells whereas the others do. The present article is about the membranes associated with detachment, in other words the membrane of proliferative vitreoretinopathy (PVR).

Membranes were classified as early or late according to the known duration of the PVR (less or more than three months). The cellular content did not differ greatly between early and late membranes, but there was a tendency for retinal pigment epithelial (RPE) cells to disappear from some of the late membranes, whereas glial cells tended to persist.

So far as extracellular material was concerned, all contained collagen types I, III, and IV, and type II was present in only 70% of membranes and was a minor component where it did appear. Collagen types I and III were the most abundant. This indeed is not altogether surprising if, as stated at the outset, these collagens are associated with scarring. Fibronectin was present in all membranes but most prominent in the early ones; again this is a protein associated with healing mechanisms. A peculiar thing about the association of

collagen types I, III, and IV with glial cells was that only some glial cells seemed to be associated. In other words the distribution of the collagen was patchy, and indeed the distribution of the other proteins – fibronectin and laminin – was erratic as well. The paper gives full details, but the association of the various proteins with the various other types of cells found in the membranes (fibroblasts, cytokeratin negative or positive, or plump RPE cells), was again erratic and difficult to summarise, with the exception that the fibroblasts in all the epiretinal membranes were associated with fibronectin.

The main conclusion is that glial cells seem to figure prominently in the natural history of these membranes. They persist and even relatively increase with time and are unlikely to be artefactual. RPE elements, however, seem to decline with the passage of time, even those RPE cells which had lost their original plump form and had undergone metaplasia to a fibroblast-like appearance.

This is a rather difficult article for clinicians to read and to fully understand, but nevertheless the conclusions in the last few paragraphs are particularly interesting, as the authors try to pull together the complex findings to arrive at a reasonable understanding of the laminar nature of these peculiar membranes and their 'peelability'. In the final paragraphs the authors give a closely argued and convincing account of their conclusion that, in contrast to what has from time to time been suggested, glial cells probably play an important part in the production of PVR membranes but are not the sole elements. Furthermore the ingenious suggestion is made that other cellular elements participating in the process tend to generate a tendency to lamination in these membranes which may favour 'peelability' layer by layer.

As an ophthalmologist who has never tried peeling a membrane, the whole exercise has always struck me as likely to be so difficult as to be well-nigh impossible. The fact that it is sometimes so successful is certainly a tribute to the persistence of the originators of this form of surgery, just as the present article demonstrates the ingenuity and persistence of the basic scientists working in the same field.

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