Star-shaped Fold in a Case of Retinal Detachment

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In a man of 39 one eye was removed because of pain and constant irritation, while there was also incipient bulbar atrophy. Nineteen years earlier there had been a retinal detachment in this eye after a trauma. It had been operated on once but without success.

The histological findings were: 1. a total detachment; 2. shrivelling of the vitreous; 3. a membrane of connective tissue on the substratum of the retina that, starting at the pars plana, covered it except in the central area, where it left the retina and followed the exterior surface of the vitreous; 4. several folds, including a fairly characteristic star-shaped fold, apparently formed by the preretinal connective tissue membrane.

Regarding the nature and origin of the cells that make up this membrane opinions are divided. It has been thought that they might originate in the walls of the retinal blood vessels. Further, it is supposed that under divers pathological conditions the cells of the ciliary epithelium can form connective tissue, although it seems rather unlikely that an ectodermal structure would be able to form mesodermal connective tissues. A third possibility is that the membrane is formed by the cells that are found scattered over the periphery of the vitreous. Morphologically these cells most closely resemble histiocytes. In order to obtain more conclusive evidence for this opinion an effort was made to find out whether they could absorb trypan blue. It proved that this was indeed the case as long as the puncture of the anterior chamber with the concurrent penetration of the haemato-ocular barrier enabled the dye to impregnate the vitreous in sufficient quantity.

Nowadays most authors agree that histiocytes can alter into fibro-blasts.

It is more difficult to determine the factors that lead to membrane forming and shrivelling.

Membrane forming can also take place without subsequent shrivelling, as was evident, e.g., on the slides of an eye that had been operated on repeatedly for a retinal detachment and in the posterior portion of which a distinct

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membrane had formed on the inner side of the retina. It seems plausible that with a given composition and a given Ph of the subretinal fluid, resp. the degenerated vitreous, the most favourable predisposition for membrane forming and retraction is created. This is the reason that individual differences in the composition can explain why in one case membrane and fold forming make their appearance while in another case this does not occur. The reason, however, why the folds, and particularly the star-shaped folds, are generally localized more or less far away from the lesion or site of operation and why the preferred place is the inferior temporal quadrant still remains difficult to explain.

For further study of the basic problems not only clinical and histological, but also biochemical and physicochemical investigations will be needed.

Discussion

Manschot: The conception of an absolute separation between ectodermal and mesodermal tissue now belongs to the past. It is beyond doubt that the ciliary epithelium can form connective tissue. Further, more than once connective tissue has been encountered within an intact lens capsule.

Hamburg: This question was discussed with a general pathologist. He could cite no conditions under which such a transition would occur.

Schweitzer: The forming of star folds seems to be related to the occurrence of retinal or pre-retinal haemorrhages. Could the connective tissue formations originate in the walls of the retinal vessels? If this is the case, could there be a relation between the growth of connective tissue and *Uveitis proliferans*?

Hamburg: As has already been pointed out, some writers do assume that the pre-retinal connective tissue formations originate entirely or partly in the walls of the retinal vessels. That hereby haemorrhages have an strongly provocative influence is a well-known fact. With some reserve this question can therefore be answered in the affirmative.

Crone: Sub-temporal localization is not surprising; super-retinal holes in the retina are the most frequent. After coagulation, fluid that may contain toxic elements is retained longest sub-temporally-

Hamburg: This assumption was not mentioned because it does not seem very well-founded. As the star-shaped folds usually occur several weeks after coagulation it seems more likely that in the meantime the toxic elements have spread throughout the subretinal fluid rather than that they have accumulated in the temporal lower quadrant.