CASE NOTES

CONGENITAL PIGMENTATION OF THE CORNEA*

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CONGENITAL deposits of pigment may be found in the epithelial or endothelial layer of the cornea (Duke-Elder, 1938; Berliner, 1949). In the Chinese race, the normal pigmentation of the limbus may extend a little distance beyond the limbal margin into or underneath the corneal epithelium. Melanin deposit on the endothelial layer may be associated with filaments of persistent pupillary membrane adherent to the posterior surface of the cornea. The case reported below is unique in that it does not fit into either of these two categories.

Case Report

Male, Chinese, aged 21.—He visited the out-patient department of the David Gregg Hospital in the Hackett Medical Centre on February 20, 1951, because of a tiny foreign particle on the right cornea. After removal of the foreign matter, I could see no other pathological lesion in the right eye.

Upon routine examination of the patient's left eye, I could discover no abnormality other than a triangular area of fine haze, located in the inferior third of the cornea (Fig. 1). When viewed with oblique illumination under a loupe, this nebulous area could be resolved into numerous small dots of pigment. The arrangement of the dots closely resembled that of keratic precipitates in iridocyclitis. When this area was observed by slit-lamp microscopy, the dots were seen to have approximately uniform dimensions; they assumed a golden-yellow colour and crow-foot-like appearance. Most of them lay so close together that their pseudopods touched one another. The colour, shape, and size of the dots reminded one of the congenital iris pigment occasionally perceived on the anterior lens capsule; optical section of the cornea showed them to be situated in the foremost lamellae of the corneal stroma (Fig. 2).

There was no neovascularization of the cornea. The thickness and curvature of the cornea were within normal limits. Vision in the right eye was 6/10, in the left eye 6/7.5.

Comment

The pigment dots were fortuitously observed in the left eye which had always been healthy, and had given no cause for complaint. There was no history of inflammation or trauma, nor of any drugs being instilled into the eye. No melanotic changes were found in the conjunctiva, sclera, or iris.

As far as we can judge, the pigmentary anomaly of the cornea is of congenital

* Received for publication July 11, 1951

FIG. 1.—Anterior view of cornea, showing distribution of pigment.

FIG. 2.—Optical section seen with biomicroscope, showing pigment in anterior part of cornea just behind epithelial layer.

origin, and its development should be traced back to the second month of embryonic life. According to Mann (1948), in the 8-mm. human embryo (30 days), the lens vesicle, which is connected with all the surrounding cells by fibrils of the anterior and posterior mesostromal vitreous, lies in close apposition to the surface ectoderm from which it has just separated (Fig. 3).

FIG. 3.—Section through 8-mm. human embryo.

The narrow space between the surface ectoderm and the lens is occupied by a mesostromal condensation, along the deep surface of which two waves of cells will grow from the reservoir of undifferentiated mesoderm lying between the lens and the margin of the optic cup. The first wave of cells will form Descemet's endothelium; the second, slightly posterior to it, will form the

stroma of the iris and the pupillary membrane. A third wave, between the mesostromal membrane and the surface ectoderm, will form the substantia propria of the cornea. By the 25-mm. stage (7 weeks), the two waves of cells which form the cornea are complete, and the mesodermal iris is represented by a very thin layer of cells lying in contact with the lens capsule (Fig. 4).

FIG. 4.—Section through 25-mm. human embryo.

There is as yet no ectodermal portion to the iris, as the margin of the optic cup has not begun to differentiate and barely reaches the equator of the lens. The pigment manifested in the cornea of our patient's left eye was evidently derived from the same source as that in the mesodermal iris.

Summary

Golden-yellow, stellate pigment dots were observed in the foremost lamellae of the corneal stroma of a patient's eye. They aggregated in the inferior portion of the cornea in a triangular configuration which resembled keratic precipitates in iridocyclitis. They apparently arose from the same source as the chromatophores of the mesodermal iris.

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