Radial retroiridal linear pigmentation

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SUMMARY Radial retroiridal pigmented lines found on the peripheral anterior capsule of the lens have been interpreted since their description by Vogt as remnants of the tunica vasculosa retroiridalis (membrana capsulopupillaris). They were found in nearly 5% of adults. A control examination of 1108 children and juveniles failed to reveal a single example. They are therefore thought to be caused by pigment released from the posterior layers of the iris, particularly near the pupillary border in old age, as a result of constant abrasive movements of the iris on the anterior surface of the lens.

Pigment is deposited on the lens capsule after iritis and as part of the syndrome of pigmentary glaucoma. It also is found as a vestige of the embryonic vascular system when it is arranged as tiny points or dots or as a fine network. Within this pupillary membrane small blood vessels may be revealed histologically, and fluorescein angiography may show their presence clearly even in adult life.¹⁻⁵

Brückner⁶ first described fine radial pigmented lines on the rim of the lens and presumed they were a vestige of the membrana capsulopupillaris. Additional cases have been reported in healthy eyes.⁷⁻¹⁴

Streiff⁹ and Bischler¹¹ suggested that the pigmented lines described by Vogt may not be a remnant of the membrana capsulopupillaris or tunica retroiridalis, because they tend to alter with time and in some cases completely disappear. They thought the pigment granules might originate from the pigmentary layer of the posterior surface of the iris.

Results

Patients admitted to Bad Hall have to undergo a compulsory and detailed eye examination with wide mydriasis in the ophthalmological department of the Paracelsus Institute of the Land of Upper Austria. Fine radial pigmented lines were frequently found on the anterior surface of the lens. They were extremely thin and thread-like, often made up of a succession of points, on one or both halves of the lens periphery and sometimes even on the whole circumference of

Fig. 1 Pigment scratch marks of the iris on the anterior surface of the lens (arrows)

the equator of the lens; they occurred in groups or singly, commonly in the lower nasal quadrant (Fig. 1).

The average age of the patients was 67.9 years; the youngest patient was 50 years old. 27.3% of 176 patients showed such radial pigment in one eye only and 72.7% on both eyes. 33% were men and 67% women. 21.6% were diabetics. Orth stressed a possible connection between diabetes and the appearance of pigmentation on the front surface of the lens.¹⁵

The majority of the patients suffered from vascular hypertension (Table 1). Six patients had pseudo-exfoliation of the lens capsule as well as pigment lines.

In younger patients radial retroiridal pigmentation

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Table 1 Patients with radial retroiridal pigmentation lines

Total	F	M	Mean age (years)	Mean tension (mmHg)	Diabetics	Mean blood pressure (mmHg)	Pigment scratch marks	
							One side	Both sides
176 100%	118 67%	58 33%	67.9	16.1	38 21.6%	201	48 27.3%	128 72.7%

lines on the anterior surface of the lens were never found. A total of 1108 children and youths were examined after mydriasis. Characteristic rests of the embryonic pupillary membrane were recorded in 61.4%. These findings agree with those of Waardenburg.¹⁶ Not a single case of radial retroiridal pigmented lines was discovered in the children examined. Thus our observations conflict with the opinion of Brückner,⁶ Vogt,⁷ and Bücklers¹⁰ that radial retroiridal pigmentation is a residue of the tunica vasculosa retroiridalis.

Discussion

The formation of linear retroiridal pigmentation is unlikely to be determined by a process of regression of the embryonic pupillary membrane^{17,18} but depends on factors possibly connected with aging (arteriosclerosis, hypertension, diabetes, etc). It is known that advanced age brings about changes in the pigment epithelium of the iris—a loss of melanin, vacuolisation, and necrosis of the pupillary border.^{19,20} After 55 years of age a slow destruction of the pigment epithelium of the iris usually begins at the edge of the pupil. Fine pigment granules of the degenerating iris are deposited on the stroma of the iris and the trabecular meshwork of the chamber angle.²¹ The radial deposits on the lens are probably part of the same process. They can be seen only after wide mydriasis and are therefore easily overlooked. The central pupillary area is always free of pigment.

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