Posterior polar cataract is a rare entity that has been reported to occur in up to 5 cases per 1000. It is generally congenital or familial. If congenital, it can be sporadic and is usually unilateral and associated with failure of regression of the tunica vasculosa lentis, an embryologic hyaloid structure. If familial, it is usually bilateral and can be hereditary or due to mutation in the PITX 3 gene. Morphologically, a posterior polar cataract consists of dysplastic lens fibers that migrate posteriorly from the equator, forming an opacity in the central portion of the posterior capsule. It is generally round and discoid and clearly demarcated from the rest of the lens. The increased frequency of posterior capsule rupture in cases of posterior polar cataract is due to the fragility of the posterior lens capsule, which is assumed to result from the adherence of dysplastic lens tissue to the capsule.

We present a case of bilateral posterior polar cataract in which histologic analysis of the posterior capsule showed the presence of uveal pigment tissue embedded in the substance of the posterior capsule. To our knowledge, this has not been previously reported.

CASE REPORT

A 19-year-old man presented with bilateral dense posterior polar cataracts and a corrected distance visual acuity of 0.78 logMAR in both eyes. Slitlamp examination showed an obvious central defect in the posterior capsule, with extension of a pigmented lenticular opacity into the anterior vitreous in both eyes (Figure 1, a). There were no other anterior or posterior segment pathologies.

Phacoemulsification was performed with low flow parameters using an Infiniti phacoemulsification system (Alcon Laboratories, Inc.). The bottle height was 60 cm with a linear vacuum of 200 mm Hg, fixed aspiration flow of 25 cc/min, and linear torsional power of 100%. After the cataract was removed, a focal area of pigmentation was noted in the posterior capsule. As the dense pigmented plaque was present in the visual axis, it was removed by a primary posterior capsulorhexis. A limited anterior vitrectomy was performed, and the intraocular lens was implanted in the bag (Figure 1, b). The rest of the iris appeared normal. The posterior capsule was sent for histologic analysis. A similar procedure was performed in the fellow eye at a later date with identical intraoperative findings.

Histology

Histologic study using periodic acid-Schiff (PAS) stain of the posterior capsule in both eyes showed folded and fragmented posterior lens capsules with adhered uveal pigment. The presence of uveal tissue in the posterior capsule indicates a developmental anomaly—the incorporation of tissue derived from the primitive neuroectoderm of the optic cup into the posterior polar cataract.
Figure 1. a: Preoperative photograph showing a densely pigmented posterior polar cataract. b: Pigmented plaque on the posterior capsule after the cataract has been removed. c and d: Primary posterior curvilinear capsulorhexis to remove the plaque from the visual axis. e: Dense pigmentation of the plaque against the sclera. f: Eye after implantation of intraocular lens.

Figure 2. a: Low-magnification photomicrograph showing folded posterior lens capsule with adherent uveal pig-ment (asterisk) and a small fragment of lens matter surrounded by uveal tissue (arrow) (PAS stain, original magnification×100). b: High-magnification photomicrograph showing the lens matter surrounded by uveal pigment (PAS stain, original magnification×400).
fragmented posterior lens capsules with adherent uveal pigment (Figure 2, a [asterisk]). A small fragment of lens material surrounded by uveal pigment was also observed (Figure 2, a [arrow]). The findings were consistent with the presence of uveal tissue in the posterior capsule of the lens.

**DISCUSSION**

The exact pathology of posterior polar cataract is unknown. However, as mentioned, it is now generally agreed that posterior polar cataract is a congenital condition that occurs sporadically due to failure of regression of embryonic vasculature or is familial and results from an autosomal dominant inheritance or a particular mutation in the PITX 3 gene.

To our knowledge, no report in the literature shows the presence of iris tissue in the posterior capsule. As iris is neuroectodermal in origin, its presence in posterior polar cataract indicates an early developmental defect at the stage of invagination of the surface ectoderm into the primitive optic cup (comprising neuroectoderm), with improper separation of the 2 layers and possible embedding of neuroectodermal tissue in the lens vesicle. At its point of contact with the posterior part of the lens vesicles, the anterior layer of the optic cup could have become incorporated in it.

This tissue could later have differentiated into iris tissue within the lens. The bilateral occurrence of iris tissue in the posterior capsule in our patient lends credence to our theory of a developmental rather than an acquired etiology (Figure 3).

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