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PIGMENT DISPERSION SYNDROME

SIGNS AND SYMPTOMS
Pigment dispersion syndrome (PDS) is generally an asymptomatic disorder discovered upon routine evaluation. Pigmentary glaucoma, a sequela of PDS, may likewise be asymptomatic, or it may present with complaints related to episodic rises in intraocular pressure, such as colored haloes around lights, blurred vision or subtle ocular pain. Both conditions are typically encountered in young, white males between the ages of 20 and 40 years. Myopia is also a commonly associated finding.

With the slit lamp, patients with PDS and pigmentary glaucoma demonstrate bilateral liberation of iris pigment in the anterior chamber. Often, this is seen as a granular brown vertical band along the corneal endothelium, known as Krukenberg's spindle.

You may also see pigment dusting on the lens, the surface of the iris and at Schwalbe's line. With the gonio lens, you may see dense pigmentation, which looks similar to melted chocolate, covering the trabecular meshwork in 360 degrees, though it will be most prominent in the inferior quadrant. The angle itself remains patent, and in some cases appears atypically wide open. Radial, spoke-like transillumination defects of the mid-peripheral iris are another common finding. While the intraocular pressure is normal in PDS, it may rise sharply in cases of pigmentary glaucoma, particularly after vigorous exercise or pharmacologic dilation. Likewise, PDS presents with a normal optic nerve appearance, while patients with pigmentary glaucoma manifest evidence of glaucomatous optic atrophy and associated field loss.

PATHOPHYSIOLOGY
Pigment dispersion occurs as a result of the proximity between the posterior iris pigment epithelium and the zonular fibers in some patients. The abrasive nature of this physical contact leads to mechanical disruption of the iris surface and release of pigment granules into the posterior chamber, which follow the flow of aqueous into the anterior chamber angle. Once lodged in the trabecular meshwork in sufficient quantity, the pigment can effectively block aqueous outflow, elevating IOP. When this occurs, we refer to the condition as pigmentary glaucoma.

Studies using ultrasound biomicroscopy show anatomic differences in the angles of some patients with PDS and pigmentary glaucoma, whereby there is a posterior bowing of the peripheral iris which precipitates the zonular touch. In addition, it's possible that so-called "reverse pupillary block" can contribute to PDS; the pressure in the anterior chamber may intermittently exceed that in the posterior chamber, causing this backward displacement of the iris that increases pigment liberation and leads to IOP spikes.

MANAGEMENT
As PDS has no direct ramifications on ocular health or vision, other than potential future development of pigmentary glaucoma, consider these patients to be glaucoma suspects and monitor for IOP spikes and optic nerve changes three to four times per year; perform threshold visual fields and gonioscopy annually. Patients with confirmed pigmentary glaucoma are best managed using topical miotics as a first-line of defense.

Miotics are preferable to beta-blockers or adrenergic agents because they have a dual effect: (1) lowering the IOP and (2) contracting the pupil, thereby pulling the peripheral iris away from the zonular fibers. Begin with 1 or 2% pilocarpine solution QID; in younger patients consider 4% pilocarpine ointment administered once daily at bedtime as an alternative. If this is unsuccessful in controlling the IOP, or if a pre-presbyopic patient is affected by miotic side effects, consider adding an additional medication such as timolol, dipivefrin, dorzolamide or latanoprost.

Progressive, poorly responsive cases may require surgical intervention, either argon laser trabeculoplasty or filtering surgery. More recently, some doctors have recommended laser peripheral iridotomy in patients with evidence of posterior iris bowing to flatten the iris profile. While this procedure has demonstrated success in select cases, it is still somewhat controversial.