

## HANDBOOK of Ocular Disease Management

### Pseudoexfoliation Syndrome and Pseudoexfoliative Glaucoma

**Signs and Symptoms:** A patient with pseudoexfoliation syndrome remains asymptomatic until an advanced glaucoma develops. The condition is most common in those in their 50s to 70s; glaucoma develops later in this age range. Pseudoexfoliation syndrome begins unilaterally but becomes bilateral within about seven years.

The patient will present with a fine, flaky material on the anterior lens capsule at the pupillary margin. Over time, this will coalesce into a characteristic "bull's-eye" pattern. There is often increased transillumination of the iris at the pupillary margin, and there may be pigment granules on the endothelium and iris surface. Within the angle there will be heavy pigment reminiscent of pigment dispersion syndrome, and you may see a clear, flaky material. Initially, IOP is unaffected, but later rises in up to 40% of patients.<sup>1</sup> In these cases, characteristic glaucomatous cupping and visual field loss may ensue.



Pseudoexfoliative material on anterior lens capsule in pseudo-exfoliation syndrome and pseudo-exfoliative glaucoma.

**Pathophysiology:** We don't know conclusively the nature of the material deposited in the anterior chamber. Most researchers agree that it represents abnormal basement membrane that structures within the anterior chamber secreted and deposited on the anterior lens capsule, iris surface and trabecular meshwork. Because material accumulates at the pupillary margin, there is increased apposition with the iris and subsequent erosion of iris pigment as the pupil dilates and constricts. This leads to increased iris transillumination and deposition of pigment granules on the endothelium, iris surface and trabecular meshwork. Because this involves deposition of material on the anterior lens capsule, and not flaking-off of the lens capsule, lensectomy is not a cure.

Glaucoma typically develops due to a build-up within the trabecular meshwork of pigment granules and pseudoexfoliative material. Patients develop a secondary open-angle glaucoma. However, studies have identified patients with increased IOP but no decrease in facility of aqueous outflow.

**Management:** Pseudoexfoliation syndrome without an IOP rise requires only periodic monitoring of IOP, discs and visual fields. When first diagnosing pseudoexfoliation syndrome, do automated visual fields to look for preexisting field loss; pseudoexfoliative glaucoma waxes and wanes.

Treat pseudoexfoliative glaucoma the same way you would POAG--with topical beta-blockers, carbonic anhydrase inhibitors, prostaglandin analogs and alpha-adrenergic agonists. The IOP level in pseudoexfoliative glaucoma is typically higher than it is in POAG and is more difficult to lower. Laser trabeculoplasty and filtration surgery are often indicated earlier with pseudoexfoliative glaucoma than in POAG.

Miotics can effectively manage pseudoexfoliative glaucoma. Pupil constriction reduces the rubbing of the posterior iris against the pseudoexfoliative material, thus reducing the amount of pigment and material released into the aqueous convection current.

#### Clinical Pearls:

- An initially normal IOP measurement does not preclude the possibility that the patient previously had elevated IOP with subsequent field loss and disc damage.
- Serial photographs and automated visual fields are more appropriate than IOP measurements for managing this condition. The patient may have progression yet manifest normal IOP in the office during a trough.
- ALT and filtration surgery are more effective in controlling IOP in cases of pseudoexfoliative syndrome than in POAG.
- Patients with pseudoexfoliative glaucoma have wider fluctuations in IOP throughout the day than do patients with POAG. The highest IOPs in patients with pseudoexfoliative glaucoma occur outside of normal office hours.

1. Henry JC, Krupin T, Schmitt M, et al. Long term follow-up of pseudoexfoliation and the development of elevated intraocular pressure. *Ophthalmol* 1987; 94: 545-9

### Information About Pseudoexfoliation

Pseudoexfoliation is a hereditary condition that can affect the support system (zonule) of the human lens. During cataract surgery (surgery to remove a cloudy human lens), this support system weakness can cause removal to be more difficult.

During cataract surgery, I may use devices to stabilize the cataract during its removal. In addition, a tiny and near-circular plastic ring may be inserted in order to support the sac that surrounds the cataract (the lens capsule). The purpose of this FDA-approved device (called an endocapsular tension ring) is to permit the lens capsule to retain its circular shape after cataract removal. During the now-completed FDA studies, these devices were definitely beneficial. By causing the lens capsule to retain its circular shape, the chances of the lens implant remaining in the correct position are greatly improved.

These devices have been in use for more than 10 years throughout the world, and there have been no adverse effects reported. I believe that implanted devices have fewer ill effects, and then if they had not had the ring implanted.

Rarely, the structures supporting the lens capsule can be so weak that the FDA approved version of the capsular tension ring is insufficient to provide adequate support to the lens capsule and implant. In these cases, specially designed capsular tension rings can be sutured to the eye in order to increase their ability to maintain the correct position of the ring, surrounding lens capsule and lens implant after surgery. Please note that these sutured versions are commonly used throughout the world, but have not been approved by the FDA for use in the United States. It is also uncertain as to whether or not they will ever be approved, because the companies manufacturing these implants may be unwilling to incur the great expense of an FDA study that would likely result in their approval. These devices have been used for approximately ten years, and I am convinced that they are extremely valuable for those occasional situations in which a standard capsular tension ring is inadequate.

Please be advised that, if I am to be your surgeon, I must have your approval to do whatever I feel is in your best interests during the surgical procedure. This would include the implantation of a sutured capsular tension ring in the unlikely event that I find this to be necessary in order to give you the best possible result.

Harry H. Huang, M.D.

I have read and understand the above, and hereby give my permission to Dr. Huang to use either an FDA approved capsular tension ring or a non FDA-approved sutured capsular tension ring should be, in his sole judgment, find this to be necessary in my case.

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Patient's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness