

Managing Primary Angle Closure

Lens extraction or peripheral iridotomy?

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Primary angle closure (PAC) is a global health problem for which laser peripheral iridotomy (LPI) is currently the standard therapy. Surgical lens extraction (LE), however, has been gaining popularity as an alternate initial intervention. This article compares the two treatment options.

PATHOPHYSIOLOGY

In eyes with PAC due to pupillary block, contact between the iris and crystalline lens interrupts the conventional flow of aqueous from the posterior to the anterior chamber. The peripheral iris then bows forward and may obstruct the trabecular meshwork in the anterior chamber angle. If the pupillary block persists long enough, an acute attack develops, which requires emergency intervention to prevent irreversible glaucomatous optic neuropathy and blindness. More commonly, the mounting attack breaks spontaneously without symptoms severe enough to drive the patient to seek medical attention. If sufficient in number, these episodes will lead to trabecular dysfunction and the formation of peripheral anterior synechiae. The resultant chronic elevation of IOP may cause glaucomatous optic neuropathy.

Physicians must recognize who is at risk of PAC and then eliminate the mechanism of angle closure to prevent not only acute attacks but also chronic synechial adhesions. Any remaining increase in IOP must also be controlled to prevent glaucomatous progression.

WHO NEEDS TREATMENT?

Treatment for PAC is typically indicated if gonioscopic evidence of appositional or synechial angle closure is present. If the angle is narrow but does not demonstrate any areas of closure (primary angle-closure suspect), treatment can be deferred and the patient monitored closely.

In these cases, prophylactic therapy, usually an LPI, may be performed if the patient has a history of symptoms consistent with intermittent angle-closure attacks. If more than 270° of the angle is synechially closed and the IOP is elevated, LPI probably will not be effective, and the patient will likely require filtering surgery.

LASER PERIPHERAL IRIDOTOMY

An LPI equalizes the pressure between the anterior and posterior chambers by preventing the iris from bowing forward and obstructing the trabecular meshwork. Intervention commonly involves an Nd:YAG laser with or without pretreatment using an argon laser. Using topical anesthesia, ophthalmologists can perform this procedure in the office or at a local surgery center.

Complications of LPI include a transient postoperative increase in IOP; hyphema/hemorrhage; blurred vision; iritis; a laser burn to the cornea, lens, or retina; and corneal edema. Late complications of LPI include the patient's perception of ghost images and light reflections and the development of posterior synechiae. LPI may also accelerate natural cataractous changes to the crystalline lens. In one study, 23.3% (14 of 60 eyes) required cataract surgery within 12 months of undergoing an LPI.¹

Although most angles deepen after LPI,² some change minimally,³ which raises questions as to whether the underlying disease mechanism was adequately addressed. A recent study showed that 28% of eyes with suspected PAC (15 of 52 eyes) that underwent LPI progressed to PAC over 2 years.⁴ Moreover, in another study, up to 97% of eyes (158 of 163 eyes) required additional intervention to control their IOP.⁵

A repeat laser procedure or incisional iridectomy may become necessary if the LPI fails to create a patent opening or if the original LPI scars closed. As discussed

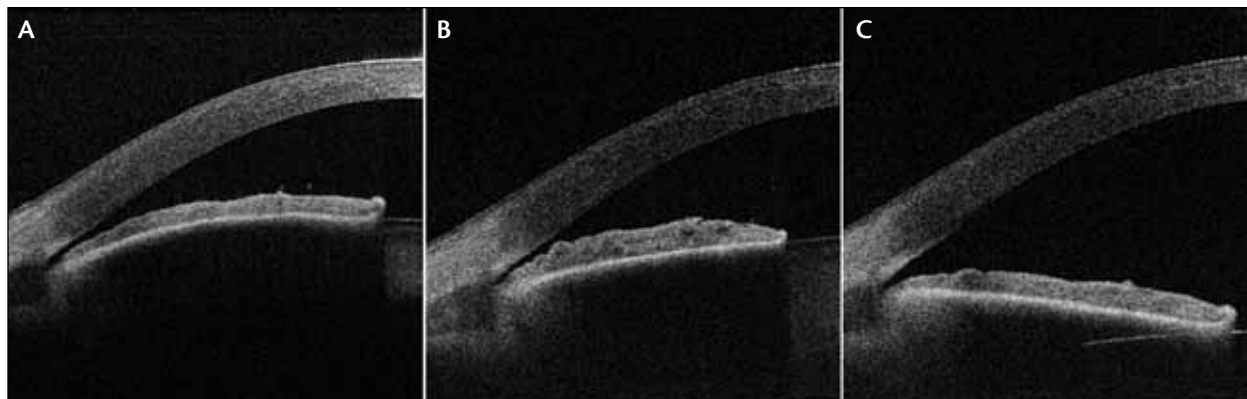


Figure. Anterior segment optical coherence tomography of an eye before treatment (A), 1 week after LPI (B), and 1 week after LE (performed 4 months after LPI; C).

elsewhere in this issue, surgeons should consider laser iridoplasty if they suspect a diagnosis of plateau iris syndrome.

LENS EXTRACTION

The crystalline lens thickens with age, which increases the risk that iridolenticular contact will cause pupillary block in eyes with PAC. Replacing the thick, convex crystalline lens with a thinner artificial IOL deepens the anterior chamber angle (Figure).⁶ Goniosynechiolysis can also be performed at the time of LE to break synechiae. One study has shown that patients with PAC or angle-closure glaucoma require fewer medications after LE compared with LPI.⁷

Removing the crystalline lens in eyes without visually significant cataracts is controversial because of the risk of serious but infrequent surgical complications such as endophthalmitis, retinal detachment, chronic cystoid macular edema, and bullous keratopathy. One could theorize that the risks would be lower than for surgical removal of a dense cataract, because clear lenses are typically easier to remove and require less phacoemulsification energy and time. A shallow anterior chamber and short axial length, however, may present challenges.

Furthermore, a loss of accommodation is an important consideration in young patients who entertain LE as a refractive surgical option. Most PAC patients are hyperopes who are already presbyopic and would generally appreciate the refractive benefits of LE.

CONCLUSION

If a PAC suspect has angles narrow enough to warrant intervention but no appositional or synechial angle closure, the authors only offer an LPI. The authors generally choose LE to treat patients with PAC who have concurrent cataracts. A discussion of the risks and benefits of both LPI and LE is necessary for patients with definite PAC who have a

clear lens or minimal cataractous changes. It appears that a paradigm shift is underway among glaucoma specialists, as they perform more LEs with positive results for the initial treatment for PAC. A prospective, multicenter, randomized, controlled trial may help guide ophthalmologists' decisions on management. ■

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