

## Canaloplasty Meets Phacoemulsification

Featured Article

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When glaucomatous progression continues despite [medicinal intervention](#), surgery often becomes the next line of defense against rising intraocular pressures (IOP) and the gradual loss of sight. If a visually significant cataract is also impeding acuity though, which procedure(s) can safely and effectively restore ocular stability and function?

Due to the frequency with which the older patient population presents with both glaucoma and cataract, and the increased incidence of cataract development following glaucoma surgery, <sup>1-3</sup> procedures have traditionally been consolidated into one treatment in an effort to minimize trauma in the comorbidity patient. Current approaches include phacotrabeculectomies, combined deep sclerectomy and cataract surgeries, and combined viscocanalostomy and cataract surgeries, all of which achieve varying degrees of IOP reduction in conjunction with cataract removal.

Patients will soon have another surgical alternative, one that holds promise for reducing both complication rates and postoperative management. Canaloplasty, a new nonpenetrating glaucoma procedure, has been paired with clear corneal phacoemulsification cataract surgery to minimize complications and allow for rapid visual recovery. Ongoing research suggests that the IOP reduction seen with the combined surgery is comparable to that reported for other dual glaucoma and cataract surgeries.<sup>4</sup>

### Two Procedures, One Day

Canaloplasty employs a nonpenetrating surgical technique to achieve decreased IOPs for its glaucoma recipients. This nonpenetrating approach has been associated with lower complication rates than trabeculectomy, with the added advantage of not requiring injurious fistulas or blebs to reroute the aqueous outflow system. Instead, canaloplasty restores the trabeculocanalicular outflow pathway by dilating the entire length of the Schlemm canal with a microcatheter and inserting a trabecular tensioning suture. Aqueous humor then flows from the anterior chamber, into and around the Schlemm canal by way of the trabecular meshwork and formed Descemet window, and out through collecting channels.

Due to their complementary low postoperative complication rates, canaloplasty and phacoemulsification cataract surgery are being merged in order to maximize outcomes for the comorbidity patient. The surgery itself entails posterior IOL implantation either prior to the glaucoma procedure or once the Schlemm canal has been accessed via a microcatheter.<sup>5</sup> Additional steps are then taken to ensure a bleb does not form.

A recent study examined the safety and efficacy of using a microcatheter (iScience Interventional) within the context of such a combined canaloplasty and clear corneal phacoemulsification surgery.<sup>4</sup> Interim analysis of this 5-year prospective study showed that at 12 months, the [mean patient IOP](#) had decreased by 44% of the mean baseline IOP. At 9.3mmHg to 18.1mmHg, this range of 1-year postoperative IOPs compares favorably with those of other combined glaucoma and cataract surgeries.

Other findings included a highly statistically significant difference between the number of IOP-lowering medications used at baseline and at the 1-, 3-, 6-, and 12-month follow ups; lower IOPs in participants with sutured eyes; and a 0.21 logMAR improvement in best corrected [visual acuity](#) at 12 months.<sup>4</sup> It is important to note that the study also showed that the two procedures were more successful at reducing IOP together than when performed independently.

### Considerations

As stated previously, open-angle glaucoma patients are the subjects of ongoing canaloplasty research. Canaloplasty is ideal for patients with uncontrollable IOP that have not undergone other procedures.

Patients will also appreciate current adverse event rates for the combined canaloplasty and cataract surgery: there has been a 0% incidence of hypotony and only a 5.5% incidence of hyphema.<sup>4</sup> In contrast to trabeculectomy, the dual surgery also affords lower complication rates and less postoperative maintenance as bleb massage and suture management are not required.

The combined canaloplasty and clear corneal phacoemulsification cataract surgery blends a nonpenetrating glaucoma procedure with modern IOL technology in an effort to bring patients more satisfactory surgical outcomes. As current data suggests, canaloplasty in fact yields lower IOPs when paired with phacoemulsification cataract surgery than alone. Patients will soon be able to select this combined surgery to treat their glaucoma and cataract, and move treatment modalities and outcomes in their favor.

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3. Feiner L, Piltz-Seymour JR. Collaborative Initial Glaucoma Treatment Study; a summary of results to date. *Curr Opin Ophthalmol* 2003; 14:106-111.
4. Shingleton B, Tetz, M, Korber N. Circumferential viscodilation and tensioning of Schlemm canal (canaloplasty) with temporal clear corneal phacoemulsification cataract surgery for open-angle glaucoma and visually significant cataract; one-year results. *J Cataract Refract Surg* 2008; 34:433-440.

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