

Canaloplasty may be alternative to trabeculectomy

Non-penetrating procedure found safe, effective, with similar side effects, no hypotony

By Nancy Groves

Reviewed by Diamond Y. Tam, MD

San Francisco—Non-penetrating canaloplasty may provide patients who have open-angle glaucoma with a safe, effective alternative to standard trabeculectomy, with fewer postoperative complications. A head-to-head retrospective comparison study showed no statistically significant difference in IOP reduction or medication usage reduction at up to 1 year of follow-up, said



Dr. Tam

Diamond Y. Tam, MD, at the annual meeting of the American Society of Cataract and Refractive Surgery (ASCRS).

The findings of this study, carried out with Ike K. Ahmed, MD, at the University of Toronto, also showed that adjunctive procedures and complication rates were similar in both groups, although no long-term hypotony was seen in the canaloplasty group.

“We propose canaloplasty as a possibly equally effective and maybe safer alternative to trabeculectomy in [patients with] open-angle glaucoma,” said Dr. Tam, who is a clinical assistant professor in the Department of Ophthalmology, Stanford University School of Medicine, Stanford, CA. At the time the study was performed, Dr. Tam was a glaucoma and advanced anterior segment surgery fellow at the University of Toronto.

‘We propose canaloplasty as a possibly equally effective and maybe safer alternative to trabeculectomy.’

Diamond Y. Tam, MD

Trabeculectomy, first described in the 1960s, still is considered to be the gold standard for surgical IOP control, but it is associated with numerous short- and long-term risks. These risks include blebitis, endophthalmitis, overfiltration, hypotony, corneal endothelial cell loss, dellen, bleb overhand, bleb leaks, bleb fibrosis and encapsulation, and aqueous misdirection.

“Many of these can be lifetime risks that can be visually devastating even many, many years after the surgery,” Dr. Tam said.

Canaloplasty is a newer, minimally invasive, blebless procedure for enhancing aqueous out-

Take-Home Message

Non-penetrating Schlemm's canaloplasty may be a safe and effective alternative to standard trabeculectomy. A retrospective comparison study found no statistically significant differences in IOP reduction or medication usage at up to 1 year of follow-up. Adjunctive procedures and complications were similar in the two groups of patients, although no long-term hypotony was seen in the canaloplasty group.

flow and lowering IOP. It has the potential to eliminate many of the visually threatening, late side effects associated with trabeculectomy and bleb formation and to provide sustained IOP lowering. Whereas trabeculectomy creates a new opening for drainage of aqueous humor, the goal of canaloplasty is to enlarge and clear the channels with a microcatheter so that they drain properly.

Canaloplasty is performed with an illuminated-tip microcatheter (iTrack, iScience), which, along with an injection of viscoelastic, is used to dilate the complete 360° circumference of Schlemm's canal. After this flexible device is threaded through the entire canal, a 10-0 polypropylene (Prolene, Ethicon) suture is tied to the end of the microcatheter using two long ends and a short loop. The microcatheter is then fully retracted, delivering the stitch into the canal. Viscoelastic is injected as the microcatheter is retracted.

The sutures are then cut and tied so that the loop puts centripetal tension on the trabecular meshwork, which helps maintain the opening of the canal and reduce resistance to aqueous outflow.

Dr. Tam and colleagues conducted a retrospective chart review of patients who consecutively underwent either nonpenetrating Schlemm's canaloplasty or trabeculectomy with adjunctive mitomycin-C; 25 patients were in each group. Outcome measures were IOP control and the number of glaucoma medications used.

No significant difference

“Both the canaloplasty and the trabeculectomy groups showed very statistically significant lowering of the pressure from preoperative levels to 6 months and 1 year, both being very effective. That's not really a surprise,” Dr. Tam said. “What we didn't really know was whether the comparison between the two groups would result in any differences.

“This study shows that when you compare these two groups of patients side by side in a statistical manner, there is no statistically significant difference in either the IOP lowering or the number of medications they use after surgery at both 6 months and 1 year,” Dr. Tam added. “In the medications, at 6 months it's close but did not reach statistical significance.”

In the trabeculectomy group, the mean preoperative IOP was 29.44 mm Hg, the mean at 6 months was 13.06 mm Hg ($p < 0.0001$), and the mean at 1 year was 11.63 mm Hg ($p < 0.0001$). In the canaloplasty group, the respective figures were 26.20, 13.68, and 13.46 mm Hg.

The comparison between the groups showed that the p values were 0.210 for preoperative IOP levels, 0.598 at 6 months, and 0.183 at 1 year.

Preoperatively, the mean number of medications used was 4.0 in the canaloplasty group and 3.68 in the trabeculectomy group ($p = 0.532$); at 6 and 12 months, the respective figures were 1.12 and 0.35 ($p = 0.059$) and 0.54 and 0.90 ($p = 0.785$).

No cases of hypotony

Although the complications and postoperative management issues were similar between the groups, an important finding was that no cases of hypotony occurred in the canaloplasty group, Dr. Tam said.

Findings showed that in the trabeculectomy group, laser suturlysis was performed in 4% ($n = 1$), bleb needling in 12% ($n = 3$), and tube shunt in 8% ($n = 2$).

In addition, 8% ($n = 2$) of patients had IOP < 6 mm Hg at 1 year. Complications and adjunctive procedures in the canaloplasty group included laser goniopuncture in 36% ($n = 9$) of the patients and tube shunt in 8% ($n = 2$). No patients had IOP < 6 mm Hg at the 1-year follow-up visit.

The Kaplan Meier survival curves over the 1-year study period were similar for the two groups for both complete success and qualified success. **OT**

FYI

Diamond Y. Tam, MD

E-mail: diamonddtam@gmail.com

Dr. Tam has no financial interests to report. The study was named best paper of the ASCRS session in which it was presented.