

Canaloplasty: the less traumatic alternative

Eighteen-month results confirm safety & efficacy

Norbert Körber, MD
Augenzentrum Porz, Cologne,
Germany

Canaloplasty is a recent development in non-penetrating glaucoma surgery intending to restore trabeculo-canalicular aqueous outflow without the formation of a subconjunctival bleb. The technique is being assessed as a viable alternative to trabeculectomy.

Although still considered the "gold standard" of glaucoma surgery, there exists a multitude of problems with trabeculectomy, and the traditional form of the surgery is gradually becoming obsolete. Complications from this type of surgery (typically surgical trauma and conjunctival bleb, including suprachoroidal haemorrhage, choroidal effusion, cataract formation, bleb leaks and bleb infections/endophthalmitis), whether immediate or long-term, can have devastating implications for the patient, and so, a less

invasive treatment option would seem to offer a better alternative.

Viscocanalostomy, developed by Stegmann *et al*,¹ was the first technique that appeared to offer a safe and effective alternative to trabeculectomy. However, it soon became evident that this method was not without problems of its own. Although the incidence of postoperative complications appeared to be lower with viscocanalostomy than with trabeculectomy, the non-penetrating procedure was found to be less effective at lowering IOP, and therefore the patient's dependence on medication, postoperatively, remained high. The reason for this relates largely to the fact that viscocanalostomy is able to open just 120° of Schlemm's canal, limiting its effectiveness and enhancing the procedure's likelihood of failure. Despite viscocanalostomy's inability to keep the ostia of Schlemm's canal open during the postoperative healing period, the technique, in theory, is sound.

Accessing the entirety of Schlemm's canal

Recent technological advances, however, have allowed surgeons access to the entire length of Schlemm's canal. The canaloplasty technique I described in the May 2007 issue of *Ophthalmology Times Europe*² is very similar in principle to viscocanalostomy, with the exception that — thanks to the 200 µm microcatheter iTrack, developed by iScience Surgical — it accesses the entire length of Schlemm's canal.

Canaloplasty involves circumferential dilation of Schlemm's canal with an ophthalmic microcatheter and subsequent placement of a circumferential suture within the canal. The suture is tied to apply tension to the inner wall of Schlemm's canal and to distend the trabecular meshwork inward, thereby stenting open the canal. As this technique is non-penetrating, it reduces the likelihood of complications associated with traditional, penetrating ocular surgery.

Table 1: 18-month follow-up results from the canaloplasty study.

	Baseline	3 months	6 months	12 months	18 months
n	109	89	81	82	52
IOP mmHg (mean)	23.2	15.3	15.3	15.0	15.3
IOP mmHg (std. dev.)	4.4	4.8	3.5	3.5	3.6
Medications (mean)	1.8	0.3	0.4	0.5	0.6
Medications (std. dev.)	0.8	0.6	0.7	0.8	0.8

Table 2: Role of trabecular meshwork distension in canaloplasty outcomes.

Trabecular meshwork distension grade <0.5					
	Baseline	3 months	6 months	12 months	18 months
n	52	41	42	38	27
IOP mmHg (mean)	23.6	15.8	16.2	16.1	15.6
IOP mmHg (std. dev.)	5.2	5.9	3.0	3.1	3.1
Medications (mean)	1.9	0.4	0.5	0.8	1.0
Medications (std. dev.)	0.9	0.7	0.9	0.9	1.0

Trabecular meshwork distension grade >0.5					
	Baseline	3 months	6 months	12 months	18 months
n	48	40	33	35	24
IOP mmHg (mean)	23.1	15.4	15.6	14.5*	15.2
IOP mmHg (std. dev.)	3.3	3.2	3.8	3.5	4.0
Medications (mean)	1.8	0.3	0.3	0.3*	0.3*
Medications (std. dev.)	0.7	0.7	0.5	0.6	0.6

In short...

Canaloplasty has been used around the world as a safe and efficacious non-penetrating alternative to trabeculectomy for the last three years. Dr Norbert Körber presents 18-month results of his study, which used iScience Interventional's iTrack microcatheter, to perform the procedure. The study demonstrated continued efficacy and a complication rate of 0.3%. Significant IOP-lowering results were demonstrated when using sufficient intracanalicular suture tension to result in a trabecular meshwork distension grade >0.5.