

Trabeculectomy outcomes after a failed canaloplasty.

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Background. Canaloplasty is a relatively new surgical non-perforating bleb-less technique, used to treat various types of open-angle glaucoma. It uses a microcatheter connected to a flickering red light laser source, which is inserted within Schlemm's canal, in order to position a 10-0 prolene suture that is left tensioned within the canal that is dilated with the use of viscoelastic (Figs.1 - 6). This surgery aims at facilitating aqueous outflow through natural pathways (collectors channels and aqueous veins), with less risks of post-operative complications in comparison with trabeculectomy. The results are usually good, but in some cases IOP can increase several months after surgery. In these cases, if a laser goniotomy and medical therapy are not effective, a standard trabeculectomy can be the best choice.

Purpose. To present the mid-term surgical outcomes of trabeculectomy after failed canaloplasty in comparison with eyes treated with trabeculectomy as first surgical treatment.

Material and Methods. A total of 327 eyes underwent canaloplasty at S. Maria della Misericordia Hospital in Udine (Italy) since 2008. Of these patients, 24 eyes from 23 patients (mean age 70.6 5.8) with open-angle glaucoma that underwent canaloplasty 7 to 42 months prior (mean 14.8), showed unsatisfactory IOP control despite maximum tolerated medical therapy. These patients underwent trabeculectomy with mitomycin C, which involved reopening the previous scleral flap leaving the 10-0 prolene suture from the previous canaloplasty in place in Schlemm's canal (Figs. 7 - 15). The postoperative follow-up ranged from 6 to 61 months (mean 21.8 11.5). The results were compared with a group of 24 patients (mean age 67.6 7.9) that underwent trabeculectomy with mitomycin C as the initial surgical procedure (control group).

Results. The preoperative mean IOP was 33.1 mm/Hg 10.8 (range 18-58). The postoperative mean IOP after 12 months was 14.4 mm/Hg 4.4. An IOP ≤ 21 , 18, and 16 mmHg, with or without medical therapy, was obtained in 93.3%, 86.7% and 73.3% of eyes, respectively. Additional surgery within 6 months was required in 2 eyes.

The mean preoperative IOP in the control group was 31.7 mm/Hg 13.8 (range 20-45). The postoperative mean IOP after 12 months was 14.8 mm/Hg 4.3. An IOP ≤ 21 , 18, and 16 mmHg, with or without medical therapy, was obtained in 95.8%, 83.3% and 58.3% of eyes, respectively. The pre- and post-operative IOP values are shown with scatter plots and bar diagrams in Figs. 16 and 17. The differences at all time points considered were not statistically significant (t-test $P > 0.05$). Post-operative complications (hyphema, hypotonus, choroidal detachment, atalamia) were similar in the two groups.

Conclusions. Prior failed canaloplasty did not affect the mid-term surgical outcomes of subsequent trabeculectomy in our small cohort of patients.



Fig.1. Preparation of the deep scleral flap.



Fig.2. Microcatheter with a laser flickering red light.



Fig.3. Microcatheter within Schlemm's canal (arrow).



Fig.4. The 10-0 prolene suture is knotted under tension.



Fig.5. Double prolene suture in Schlemm's canal (gonioscopic view).

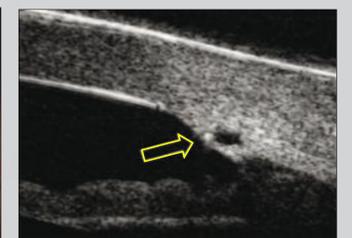


Fig.6. Prolene suture in Schlemm's canal (High-resolution UBM view).



Fig.7. Scleral incision following the borders of the previous flap.



Fig.8. Reopening of previous scleral flap.

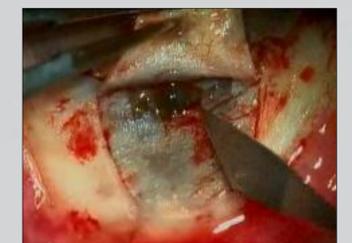


Fig.9. Incision of the trabeculo-descemet membrane and trabeculectomy.



Fig.10. Basal iridectomy.

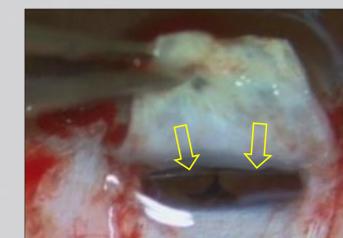


Fig.11. The prolene suture can be seen in front of the iridectomy (arrows).



Fig.12. The scleral flap is sutured with 4 nylon 10-0 stitches.

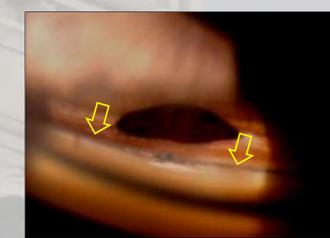


Fig.13,14,15. Gonioscopic view of three eyes after trabeculectomy in previous failed canaloplasty. The prolene suture from previous surgery can still be seen inside Schlemm's canal (arrows).

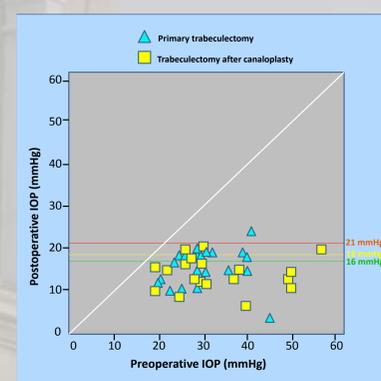


Fig.16. Scatter plot of IOP values pre and post-canaloplasty after 12 months.

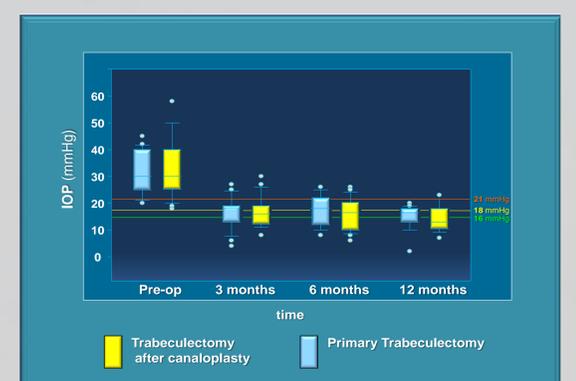


Fig.17. Box-plot representation of IOP values over 12 months of follow-up.