

## Suitability for day surgery of trabeculectomy and phacotrabeculectomy using 10-0 polyglactin suture

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Received 1 May 2001; received in revised form 1 November 2001; accepted 1 December 2001

### Abstract

**Objective:** To evaluate the suitability of trabeculectomy or phacotrabeculectomy as a day case procedure with the objective of keeping the post-operative intraocular pressure (IOP) under control, both short-term and long-term, and post-operative complications at a low level. **Method:** A total of 27 eyes undergoing trabeculectomy with or without phacoemulsification for either primary open angle glaucoma or chronic angle closure glaucoma were chosen. All of them had surgery as day cases under sub-tenon injection. IOP check was done at baseline, day 1, month 1, month 6 and year 1 on 27 eyes. Post-operative complications directly related to aqueous drainage were noted at day 1. **Result:** Mean, mode and range of IOP at each level were analysed. Mean pre-operative IOP was 23.34 mmHg. Post-operative IOP was lowest on day 1 (mean 10.03 mm) which stabilised to mean IOP of 16.3 mmHg at year 1. At 1 year the success rate (IOP less than 21 mmHg) was 92.3% without any glaucoma medication; however, if IOP control with medication (less in number than before surgery) is taken into account the success rate was 96%. Post-operative complications were few and transient. **Conclusion:** Graded control of post-operative IOP was possible using 10-0 polyglactin suture. IOP on day 1 was not very low due to adequate suture tension and at the same time good control of IOP longterm (1 year in this study) was possible due to gradual release of suture tension by slow absorption. This is ideally suited for day surgery. © 2002 Elsevier Science B.V. All rights reserved.

**Keywords:** Intra-ocular pressure; Trabeculectomy; Primary open angle glaucoma; Chronic angle closure glaucoma; Hypotony; choroidal detachment; Iris prolapse

### 1. Introduction

Among the many filtration procedures in glaucoma surgery trabeculectomy is the commonest and safest of all [1–3]. The end point of trabeculectomy is adequate control of intraocular pressure (IOP). However the control of IOP post-operatively has not always been easy. Too little drainage would mean a rise of IOP and ultimately failure of the surgery: too much drainage would result in gross hypotony and its consequent sight-threatening complications [4–8]. Serious surgical complications are most likely in the early post-operative phase. For glaucoma surgery to be successful as day cases, these complications should be kept to a minimum. Over the years many different types and tech-

niques of sutures and scleral flaps of varied thickness, size and shape have been tried to this effect [9–11]. This study evaluates the IOP control qualitatively and quantitatively after using 10-0 polyglactin suture.

### 2. Objectives

This study sought to answer the following questions:

- How was the IOP controlled postoperatively in the early stages and in the late stages? Was it too high or too low?
- What was the long-term result and how many were failures?
- If the IOP control was adequate, was post-operative medication needed at all for this purpose. If so, how many medications were needed and was this number less than the number of medications needed before surgery?

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- Were there any complications directly related to the filtration?
- Were the patients suitable for day surgery?

**3. Method**

The standard of comparison in our study was the National Trabeculectomy Audit [12,13]. Success was defined as post-operative IOP at one year less than 21 mmHg without medication. For IOP control a minimum success of 80% was established as appropriate. In our study, visual field evaluation was not included.

*3.1. Selection criteria*

Patients having trabeculectomy with/without phacoemulsification for either primary open angle glaucoma or chronic angle closure glaucoma during a period from January 1999 to January 2000 were chosen. Patients with secondary glaucoma were excluded from the study. A total of 27 consecutive eyes were evalu-

ated. They were nearly equally distributed between the two sexes (male 48%, female 52%). The age range was 61–93 years with a mean of 79 years. All patients were Caucasians.

All patients were booked as elective day cases, including ASA 2 and 3 patients. Patients had the option of staying overnight in the hotel facilities if they wanted. Identical surgical technique by a single surgeon was used in all cases. The mode of anaesthesia was sub-tenon injection. For trabeculectomy a fornix-based conjunctival flap was made superiorly. A partial thickness scleral flap, square in shape and about 5 mm wide and 4 mm from limbus, was made with one side (left) attached (Fig. 1). Trabeculectomy was done using Kelly’s scleral punch. After peripheral iridectomy the scleral flap was secured using a single 10-0 polyglactin suture at the free corner. Conjunctiva was meticulously sutured and the patency of the channel was ensured through a previous paracentesis. For combined phacoemulsification all eyes had clear-cornea hinge incision, continuous curvilinear capsulorhexis under sodium hyaluronate and in-the-bag insertion of a foldable intraocular lens (Acrysof®, Alcon).

IOP check was done at baseline (pre-operative), day 1, month 1, month 6 and year 1. All patients were brought back on the first post-operative day to record IOP and post-operative complications directly related to aqueous drainage, viz. shallow/flat anterior chamber, hypotony, bleb leak, choroidal detachment, iris prolapse into drainage. The medications to control IOP pre-operatively and, where applicable, post-operatively were noted.

**4. Results**

Mean, mode and range of IOP at each level were analysed. Pre-operatively, the mean IOP was 23.34 mmHg (overall: with or without medication). The mean post-operative IOP was lowest on day 1 (mean being 9.8 mmHg) which stabilised to 16.3 mmHg at year 1 (see Fig. 2).

Fig. 2 shows that the final mean IOP was well below the defined upper limit of success. It is evident that the mean IOP was not too low on the first post-operative day, which was desirable.

Fig. 3 shows the early (day 1 and month 1) post-operative IOP in individual eyes. Even the eyes which did have hypotony (defined as IOP 4 mmHg or less) at day 1 recovered to a comfortable region of IOP very soon. The failures were very few (7.7%) and needed either further medication or revision surgery at a later date.

Fig. 4 compares the final IOP (at year 1) with the pre-operative one. The shift of the columns to the left (meaning fall of IOP) was indicative of the desired outcome.

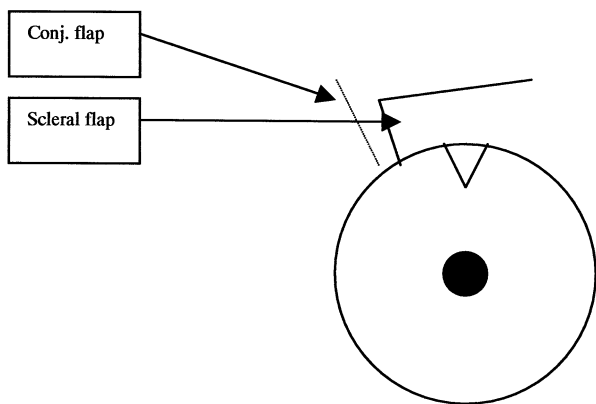


Fig. 1. Construction of scleral flap.

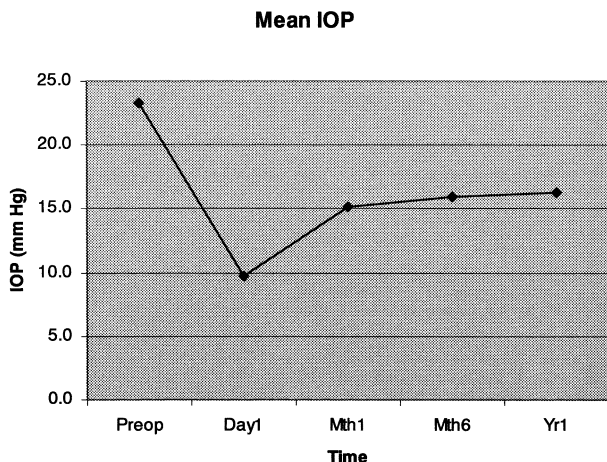


Fig. 2. Mean IOP.

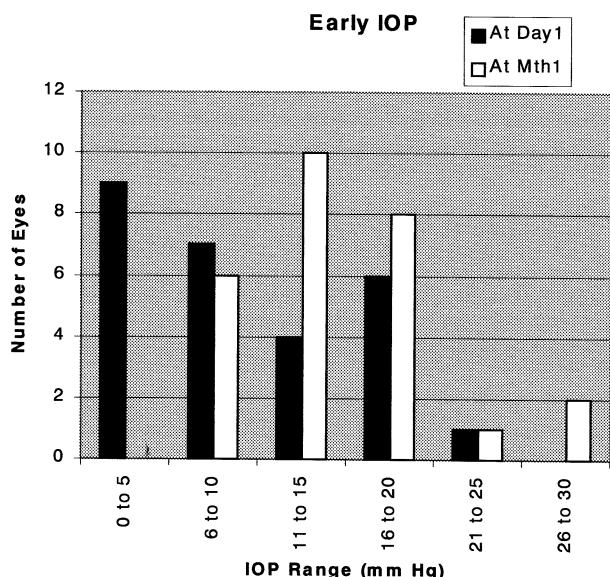


Fig. 3. Early IOP.

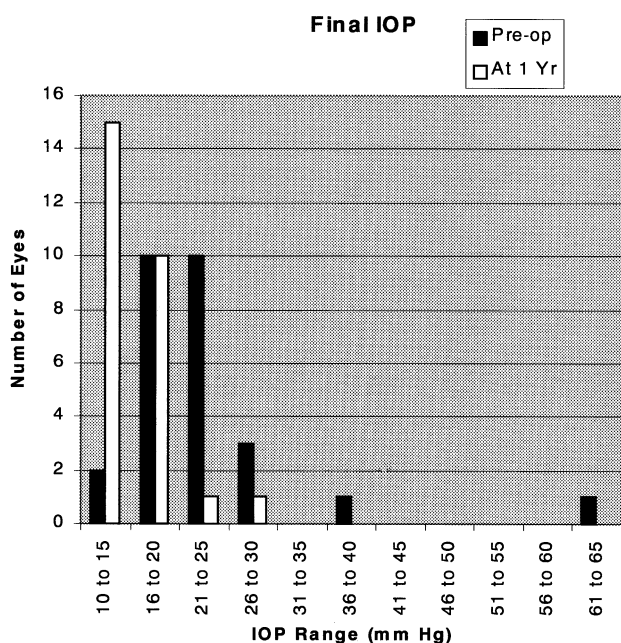


Fig. 4. Final IOP.

Fig. 5 compares the number of medications needed to control IOP pre-operatively with that needed post-operatively. The list of medications included timolol 0.5% eye drops, betaxolol 0.5% eye drops, dorzolamide 2% eye drops, latanoprost 0.005% eye drops, brimonidine 0.2% eye drops, apraclonidine 0.5% eye drops, pilocarpine 2% eye drops and pilocarpine 4% gel and acetazolamide tablets. The average number of medications used pre-operatively was 2 with a maximum of 4. At month 6, only three eyes needed medi-

cation (one in number) and at year 1 only one eye needed it (two in number).

Fig. 6 shows the post-operative complications and their relative proportions. As mentioned earlier, only those complications were considered which had direct bearing with aqueous drainage. Post-operative complications occurred in ten eyes (37% of total, i.e. 27 eyes) and were namely, bleb leak (7% of total, i.e. 27 eyes), hypotony (30%), very shallow/flat anterior chamber (15%), choroidal detachment (11%), hyphaema (30%) and iris prolapse into drainage (4%). The most relevant complication here was hypotony and relating this with Fig. 3 it can be seen that hypotony was transient.

### 5. Discussion

10-0 polyglactin has several advantages over its counterparts. It has higher tensile strength (as compared to, for example, nylon) which makes it possible to tighten the suture more and at the same time make it more secure. Hence chances of hypotony, flat anterior chamber and choroidal detachment become less in the early post-operative phase. The suture material incites little inflammation and leads to very little postoperative scarring. It is absorbed by hydrolysis within a month. Both these factors help maintain the drainage in the later post-operative phase minimising chances of bleb failure. Hence post-operative manipu-

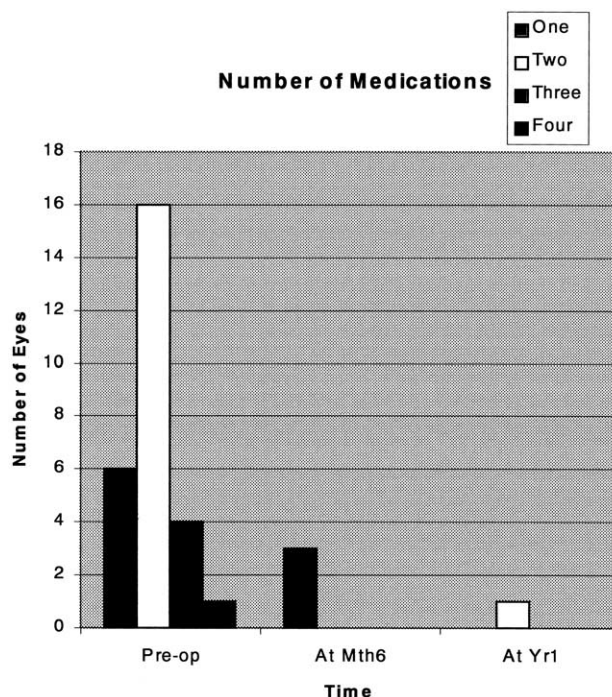


Fig. 5. Number of medications.

### Complications: Day1

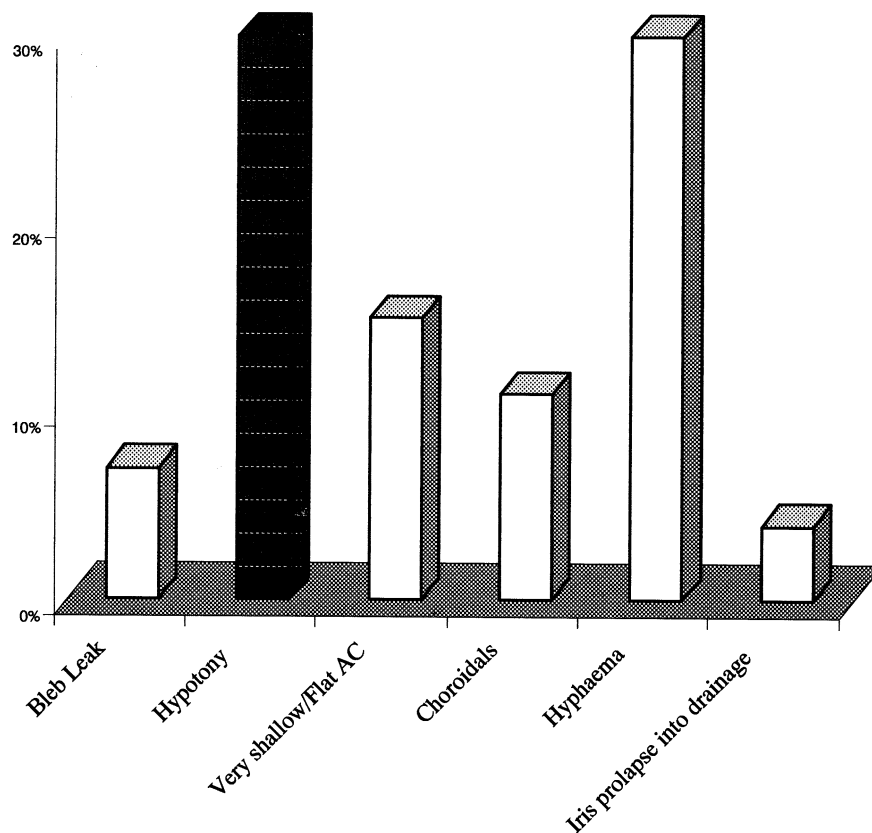


Fig. 6. Post-operative complications at day 1 (% figures show % of total 27 eyes).

lations, e.g. releasable sutures and laser suturolysis, the need for use of antimetabolites and at a later date revision surgery, all become less important. The same suture can be used economically to close the conjunctiva.

The success rate of 10-0 polyglactin in the study compares favourably with other similar studies in the following tables (Tables 1 and 2). Whenever relevant, we have included the success rates both with and without medications to control post-operative IOP. At 1 year all but two eyes had IOP less than 21 mmHg (92.3%) without any glaucoma medication; however, if IOP control with medication (less in number than pre-operative) is taken into account the success rate was 96%.

It was not our intention to study the post-operative complications of trabeculectomy as a whole, but only those directly related to the aqueous drainage. Total complications were looked at in the National Glaucoma Audit. Hence we have not cited comparisons.

Several studies [15–17] have demonstrated the advantages of sub-tenon anaesthesia over peribulbar or retrobulbar methods. In our study, all patients were operated under sub-tenon anaesthesia, which facilitated discharge on the same day and far less debility compared to general anaesthesia. This is an important factor for an elderly population where glaucoma is more prevalent. No admission and no general anaesthesia also mean more cost effectiveness for the hospital.

### 6. Conclusion

10-0 Polyglactin performs favourably for adequate long-term control of IOP after trabeculectomy, with fewer complications in the early post-operative period. This facilitates performing trabeculectomy or phacotrabeculectomy as a day case.

Table 1  
Comparison with the national audit

	Present study	National audit: performance	National audit: recommendation
Success ( $R_x$ excluded) (%)	92.3	84	80
Success ( $R_x$ included) (%)	96	93	–

Table 2  
Comparison with Vyas et al. [14]

	Present study	Vyas et al.
Mean Pre-op IOP	23.3	23
Mean IOP 1 year	16.3	14.7
Fall of IOP (%)	30	36
Success ( $R_x$ excluded) (%)	92.3	96

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