

Early Postoperative Complications of Trabeculectomy and Their Management: A Hospital Based Study



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ABSTRACT

Purpose: To study the early post-operative complications of trabeculectomy, Phaco-trabeculectomy and their management in a tertiary care center.

Study Design: Interventional case series.

Place and Duration of Study: Al-Ehsan Welfare Eye Hospital from 1st November 2020 to 30th January 2022.

Methods: One hundred and two patients who underwent glaucoma filtration surgery were selected through convenient sampling. The patients were followed up for 12 weeks and early post-operative complications, if any, were noted and managed.

Results: There were 58(56.86%) males and 44 (43.14%) females. The age ranged from 35 to 70 years. There were 48 (47.06%) pseudophakic and 54 (52.94%) phakic patients. Mean pre-operative intraocular pressure (IOP) was (31.99±5.66 mm Hg) which reduced to 12.35±4.30mm Hg one month after surgery. Trabeculectomy with 5-Fluorouracil (5-FU) was performed in 48 patients (47.06%) while trabeculectomy combined with phacoemulsification and IOL implantation was performed in 54 patients (52.94%). Primary open angle glaucoma (POAG) was present in 94 patients (92.16%) while 8 patients (7.84%) had chronic angle closure glaucoma. The early postoperative complications were shallow anterior chamber in 17.65%, pupillary membrane in 3.92% and choroidal detachment in 0.98%. Six patients (5.9%) were steroid responder and these patients were shifted to topical Loteprednol from topical prednisolone.

Conclusion: Majority of early post-operative complications of trabeculectomy are transient and settled in first two to three weeks without any surgical intervention. Anticipation, timely diagnosis and early intervention is the key to success in management of complications of trabeculectomy.

Key Words: Trabeculectomy, 5 fluorouracil (5FU), Phaco-trabeculectomy, Phacoemulsification.

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INTRODUCTION

Glaucoma represents a group of progressive optic

neuropathies which lead to irreversible vision loss. Early detection is of utmost significance. IOP is the only modifiable risk factor in glaucoma.^{1,2} As it is one of the leading causes of irreversible blindness, it poses a huge socioeconomic burden on the society. In Pakistan, approximately one million patients have lost their vision because of glaucoma.³ Most of the primary open angle glaucoma patients are diagnosed in routine clinical eye examination and they are usually not aware of their disease. However, routine ocular screening of IOP and CD ratio is not a common

practice in OPD clinics because of patient load. Low literacy rate, financial difficulties, and non-compliance of patient to prescribed treatment are few factors which contribute to advancement of glaucoma and result in either partial or complete vision loss. Furthermore, even patients who have been diagnosed with glaucoma are unaware of the gravity of the disease and often carry the false belief that surgery will reverse vision loss caused by glaucoma.

Trabeculectomy was described by Burian and Smith in 1960. In 1970, Harms subsequently modified the technique, employing a scleral flap to easily identify the Schlemm canal. It remains the gold standard surgical treatment for uncontrolled glaucoma.^{4,5} Like all surgical procedures, trabeculectomy has few complications. Early recognition and management of these complications is the key to success for long term IOP control and sight preservation.

This study describes a single centre early post-operative complications of trabeculectomy and its management.

METHODS

This study was conducted at Al Ehsan Welfare Eye Hospital from 1st November 2020 to 30th January 2022. Duration of the study was 15 months. One hundred and two cases who underwent glaucoma filtration surgery were selected for this study. The early post-operative period was defined as 4 weeks after trabeculectomy.

All patients who had uncontrolled IOP with maximum topical and oral anti-glaucoma treatment and age above 35 years were included. The exclusion criteria were patients with age below 35 years, secondary glaucoma, high myopic and patients with previous ocular surgeries like laser trabeculoplasty, goniotomy, pars plana vitrectomy (PPV), or trabeculectomy. The patients with per operative complications like posterior capsular rent, vitreous loss, conjunctival button holes and scleral flap loss were also excluded. Informed consent was obtained after explaining the procedure. All patients were given oral acetazolamide 250mg three times a day along with potassium supplementation three days prior to the surgery. Intravenous Mannitol (1mg per kg body weight) was administered pre operatively with restricted oral fluids. Topical anaesthesia was used in 98 (96.07%) patients, and peribulbar anaesthesia in 4

(3.92%) patients. The patients and at least one relative was explained about per operative complication including expulsive haemorrhage and post operative complications like decrease in vision and need of more than one ocular surgical procedures after trabeculectomy.

A single qualified and experienced surgeon performed all surgeries. For combined phacoemulsification and trabeculectomy (Phacotrab with IOL) separate incisions were made. A superior fornix based conjunctival flap was made, tenon was dissected carefully and haemostasis was secured using bipolar wet field cautery. A partial thickness scleral flap of approximately 3mm by 4mm was raised, paracentesis was done (helps to reduce IOP) and air bubble was injected to avoid anterior chamber flattening. A deep full thickness scleral flap was resected and peripheral iridectomy was done. For patients planned for combined procedure, phacoemulsification was performed after making superficial flap through a separate temporal incision. Phacoemulsification with IOL implantation was done and entrance wound was hydrated. Deep full thickness scleral block was removed and a peripheral iridectomy was performed. Superficial scleral flap was closed with two releasable nylon 10/0 sutures and conjunctiva was approximated and tightly sutured with 10/0 nylon. 5-FU, 0.02 mg was injected subconjunctival, directed away from the trabeculectomy incision. Post-operatively patients were started on Moxifloxacin 0.5% eye drops QID, Prednisolone 1% eye drops QID, and cyclopentolate 2% eye drops at night. The patients were examined at first post-operative day and after that once weekly for one month. On each visit, visual acuity, IOP and slit lamp examination was done and complications if any were noted and managed accordingly. Both releasable sutures were removed within first few days, except in patients with hypotony (IOP below 8 mmHg) though sutures can be removed later on with no effect on IOP. The patients who were steroid responders (defined as patients having high IOP 30mmHg at 2 weeks after suture removal) in first three weeks postoperatively were shifted to topical Loteprednol from topical Prednisolone.

RESULTS

Out of 102 patients, there were 58(56.86%) males and 44 (43.14 %) females. The age range was 35–70 years. There were 48 (47.06%) phakic and 54 (52.94%) pseudophakic patients. Mean pre-operative IOP was

31.99±5.66 mm Hg and post-operative IOP after one month was 12.35±4.30. Trabeculectomy with 5-Fluorouracil (5-Fu) was performed in 48 patients (47.1%) while trabeculectomy with 5 FU combined with Phacoemulsification and IOL was performed in 54 patients (52.9%). Primary open angle glaucoma (POAG) was present in 94 patients (92.2% of patient) while 8 patients (7.8% of patients) presented with chronic angle closure. These patients were followed for three months, starting from first postoperative day, weekly for one month than monthly for 3 months.

Early postoperative complications at one month follow up were seen in 23 patients (22.55%) were shallow anterior chamber with low IOP in 18(17.65%), pupillary membrane in 4(3.92%) and choroidal detachment in 1(0.98%) patient (Figure 1). Six (5.88%) patients were steroid responders (defined as IOP 30mmHg or high) in first three weeks postoperatively who were shifted to topical Loteprednol from topical Prednisolone leading to desirable low IOP. Two steroid responders needed to stop topical steroid and shifted to short term oral steroids. These complications were managed with observation, medically and surgically by suture manipulation.

In patients with shallow anterior chamber, Seidel test was positive in 50% of cases for the first 3 to 7 days while most of the cases (65%) improved only with pressure bandage (used for one day) and cyclopentolate drops twice a day. In few cases bandage contact lens (BCL) was placed for five to six days and 3 resistant cases required anterior chamber reformation with air in 2nd post-operative week. Only in one case an additional releasable suture was applied in the middle of the flap (released after two weeks) on 2nd post-operative visit in operation theatre.

In 4 cases of phaco-trabeculectomy, severe anterior segment inflammation was observed from second post-operative day and all four developed pupillary membrane, one patient developed IOL pupillary capture. All patients were given oral steroids according to body weight and topical steroids increased to two hourly for two days and then reduced to four times a day for four weeks. All patients responded well, the membrane disappeared within a week and IOP was less than 15 in all cases. Choroidal detachment was seen only in one case, three weeks post operatively. At the end of 3 months seventy-nine patients (77.5%) were stable without complications.

Other complications like hyphemia, blebitis and endophthalmitis were not seen.

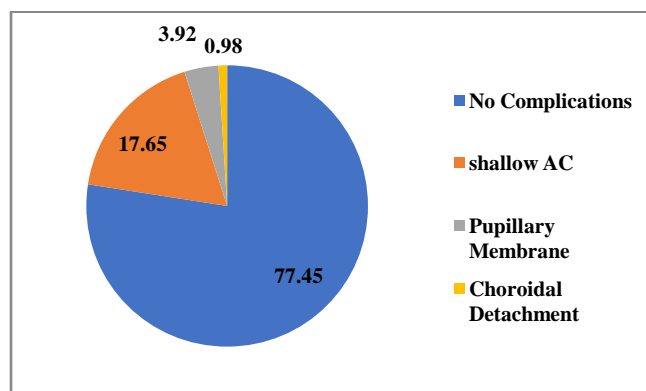


Figure 1: Post-operative Complications.

DISCUSSION

Trabeculectomy is the gold standard for glaucoma treatment in our part of the world and its long-term success depends on early recognition of its complications and their management.⁶ The importance of pressure sensitivity of the optic disc is also indicated by the fact that a 25% pressure reduction lowers the risk of glaucoma progression by 50%.⁷

Trabeculectomy without anti-metabolite has high failure rates so all trabeculectomies and Phaco-trabeculectomies were performed with 5FU. It is a pyrimidine analogue which blocks DNA synthesis and is used as antifibrotic agent to prevent scarring and subsequent failure of the procedure.^{8,9} Trabeculectomy with 5 FU was started in early 1990s to enhance the success rate, long-term survival rate and decrease the progression of glaucoma.¹⁰ 5-FU was injected in all cases except 4 patients, who had very thin conjunctiva. 5 FU is considered safe to use intraoperatively.¹¹

The most common early post-operative complication was shallow anterior chamber with low IOP.¹² At first post-operative day relatively shallow anterior chamber and low IOP with seidel test negative is desirable but shallow anterior chamber at first week with high IOP or with seidel positive needs intervention. The shallow anterior may lead to secondary complications like synechiae formation, cataract progression, corneal endothelial decompensation, hypotony maculopathy and persistent choroidal detachment so it needs early management.¹³⁻¹⁵ Releasable sutures were applied in all cases as it gives better control over the situation, if released in

first weeks helps to control IOP better. In cases of hypotony, sutures can stay for long and can be removed later on with no effect on IOP due to post-operative sub conjunctival scarring. Other studies also showed that trabeculectomy with releasable sutures is better tolerated than those without releasable sutures.¹⁶ In our study, releasable sutures were not associated with added complication as observed in other studies.¹⁶ The study also did not note a trend of flat anterior chamber or hypotony after removal of releasable suture as was mentioned in literature.¹⁷

Choroidal detachment was seen only in one case, three weeks post operatively. Flat anterior chamber, wound leak, encapsulated bleb and choroidal detachment are among the most common early post-operative complications.⁶ Choroidal detachment is particularly noteworthy, since its occurrence following trabeculectomy is more frequent than other incisional surgeries.^{19,20} In our study, Choroidal detachment settled with topical steroids, atropine and oral steroids in 6 weeks. One patient suffered further reduction of vision although surgically the eye was quiet and the IOP was around 10 mmHg. In two studies published in 2018 and 2020, conducted at Karachi, hyphema, shallow anterior chamber, corneal edema, hypotony and choroidal detachment were frequent post trabeculectomy complications.^{21,22}

Six patients (5.9%) were diagnosed as steroid responders (defined as patients having high IOP 30 mmHg at 2 weeks after suture removal) and settled well after stopping prednisolone eye drops which were exchanged with Loteprednol. Two steroid responders needed non-steroidal anti-inflammatory (NSAID) drug in combination with topical anti-glaucoma drugs as their pressure was in high teens with Loteprednol. Topical antiglaucoma was started in all 6 patients. The first 2 to 4 weeks post operative weeks are very critical in the diagnosis and treatment of early post operative complications. Timely management can help keep IOP low for a longer period of time and helps preserves vision.^{23,24}

It is important in surgical management of glaucoma that good counselling of the patient should be done before surgery which will prepare the patient mentally for any type of complication and information regarding chances of repeat intervention. The patience of surgeon is another factor to be considered as few postoperative complications are settled without intervention with close observation only.

Limitation of study was small sample size and no comparison with any group.

CONCLUSION

Majority of early post-operative complications of trabeculectomy are transient and settle in first two to three weeks without any surgical intervention. Anticipation, timely diagnosis and early intervention is the key to success in the management of complications of trabeculectomy and hence success rate of trabeculectomy.

Conflict of Interest: Authors declared no conflict of interest.

Ethical Approval: The study was approved by the Institutional review board/Ethical review board (AEWEH/MS/17).

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Authors' Designation and Contribution

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Tariq Khan; Professor: *Literature Search, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*

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