Asian Journal of Medical Research Original Article

Short-Term Complications and Associated Factors After Primary Trabeculectomy- A Clinical Study

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Abstract

Introduction: To assess short term complications and associated risk factors after trabeculectomy. **Methods:** 88 consecutive glaucoma patients in age ranged 10-16 years who underwent primary trabeculectomy or combined phacotrabeculectomy of either gender was included in the study. Primary trabeculectomy with mitomycin C (MMC) using fornix- based conjunctival flap technique was performed. Surgical complications during the first 3 months of follow- up were recorded. **Results:** There were 50 males and 38 females. Underlying diseases were diabetes mellitus in 12, hypertension in 17 and dyslipidaemia in 10 cases. Diagnosis was POAG in 20, POCG in 35, uveitic glaucoma in 15 and NVG in 18 cases. BCVA (logMAR) was 1.2 and IOP was 27.4 mm Hg. Common complications were subconjunctival hemorrhage in 2, hypotony in 1, Hypotony with serous choroidal detachment in 4, encapsulated bleb in 3 and bleb leak in 1. A significant difference was observed (P< 0.05). **Conclusion:** Hypotony with serous choroidal detachment was most common complication seen in patients undergoing trabeculectomy.

Key Words: Glaucoma, Trabeculectomy, Conjunctival flap technique, mitomycin C.

INTRODUCTION

Glaucoma is a leading cause of blindness and low vision worldwide. Most patients are asymptomatic, and late presentation of the disease can lead to a permanent visual loss. The prevalence of glaucoma is increasing.[1] Trabeculectomy remains the established gold-standard primary procedure for the treatment of medically refractory glaucoma in most cases.[2] Studies comparing initial treatment with trabeculectomy versus medical therapy have demonstrated that trabeculectomy is more successful in achieving lower intraocular pressures (IOP). Furthermore, trabeculectomy has the added advantage of stabilizing IOP by minimizing diurnal fluctuation and decreasing dependence on patient compliance with medications.[3]

Several surgical techniques have been associated with reduced risks of failure, including superonasal location of scleral flap and intraoperative use of mitomycin C. Various studies reported conflicting results on the type of conjunctival flap created. Some studies showed higher success rates with limbus-based conjunctival flap compared to fornix-based while others reported similar success rates between the two.[4]

Researches have shown successful long-term outcomes and IOP reduction after trabeculectomy in the setting of open angle glaucoma.[5] However, angle closure glaucoma (ACG) presents unique management challenges compared to primary open angle glaucoma (POAG). Unlike POAG, appositional contact at the iridocorneal angle in primary angle closure glaucoma (PACG) is believed to cause the formation of peripheral anterior synechiae, which subsequently leads to structural damage and dysfunction of the trabecular meshwork.[6] This process causes a rise in IOP, which ultimately leads to the development of glaucomatous optic neuropathy. Risk factors which were relevant for the development of complications and surgical failure were also different among studies.[7] Considering this, this study aimed to assess the short- term complications and associated risk factors after trabeculectomy.

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MATERIALS AND METHODS

A total of 88 consecutive glaucoma patients in age ranged 10-16 years who underwent primary trabeculectomy or combined phacotrabeculectomy of either gender was included in the study. The written consent for their involvement in the study was obtained. Ethical clearance form ethical and review committee was sorted before starting the study.

All underwent vision evaluation from an expert eye surgeon. The vision was checked using the Snellen eye chart. Optic disc assessment, applanation tonometry and gonioscopy were performed using slit- lamp biomicroscopy. Primary trabeculectomy with mitomycin C (MMC) using fornix- based conjunctival flap technique was performed. Surgical complications during the first 3 months of follow- up were recorded, and associated risk factors were noted. Surgical failure was defined as a postoperative IOP ≥21 mmHg or <20% reduction below baseline on the last two consecutive follow- up visits. Results of the present study after recording all relevant data were subjected for statistical inferences using chi- square test. The level of significance was significant if p value is below 0.05 and highly significant if it is less than 0.01.

RESULTS

There were 50 males and 38 females. Underlying diseases were diabetes mellitus in 12, hypertension in 17 and dyslipidaemia in 10 cases. Diagnosis was POAG in 20, POCG in 35, uveitic glaucoma in 15 and NVG in 18 cases. BCVA (logMAR) was 1.2

and IOP was 27.4 mm Hg. A significant difference was observed (P< 0.05) [Table 1, Figure 1].

Table 1: Patient characteristics

Parameters	Characteristics	Number	P value
Gender	Male	50	<0.05
	Female	38	
Underlying diseases	Diabetes mellitus	12	>0.05
	Hypertension	17	
	Dyslipidaemia	10	
Diagnosis	POAG	20	<0.05
	POCG	35	
	Uveitic glaucoma	15	
	NVG	18	
BCVA (logMAR)		1.2	-
IOP (mmHg)		27.4	-

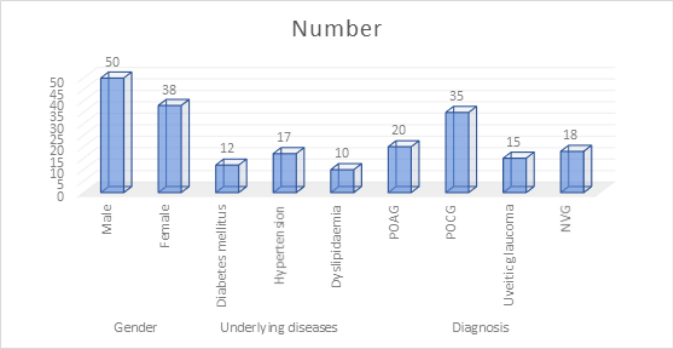
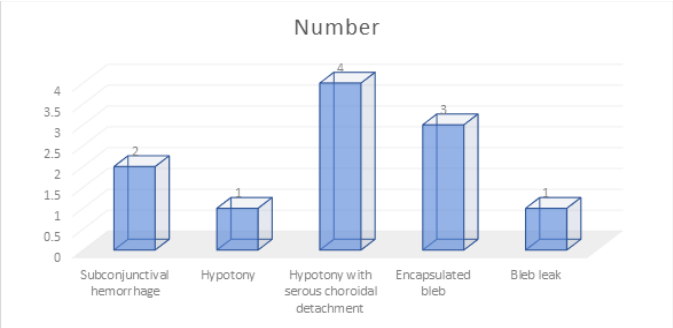


Table 2: Postoperative complications in patients

Complications	Number	P value
Subconjunctival hemorrhage	2	<0.05
Hypotony	1	
Hypotony with serous choroidal detachment	4	
Encapsulated bleb	3	
Bleb leak	1	

Common complications were subconjunctival hemorrhage in 2, hypotony in 1, Hypotony with serous choroidal detachment in 4, encapsulated bleb in 3 and bleb leak in 1. A significant difference was observed (P< 0.05) [Table 2, Figure 2].



DISCUSSION

We assessed the incidence of early postoperative complications and associated risk factors after trabeculectomy. Trabeculectomy is a primary surgical procedure used to relieve intraocular pressure (IOP) when pressure reduction is unsuccessfully controlled with medications or lasers.[8] However, there are many complications after the surgery, including subconjunctival hemorrhage, hyphema, hypotony, blebitis, endophthalmitis, and loss of vision.[9] The previous studies reported various rates and types of complications after trabeculectomy. As a result of the anatomic abnormalities that accompany ACG, there is an increased risk of severe post-operative complications, like aqueous misdirection, following filtration surgery in these patients.[10] However, few studies have compared the long-term outcomes and complications associated with primary trabeculectomy with the effects of combined phacoemulsification and trabeculectomy in the setting of ACG.[11,12]

Our study comprised of 88 consecutive glaucoma patients in age ranged 10-16 years who underwent primary trabeculectomy or combined phacotrabeculectomy which had 50 males and 38 females. Leeungurasatien et al,[13] included one hundred and eighteen glaucoma Patients. All glaucoma patients underwent primary trabeculectomy with mitomycin C (MMC) using fornix- based conjunctival flap technique. Early postoperative complications developed in 55 eyes (56.7%). Complications included hypotony (25 eyes, 27.2%), serous choroidal detachment (CD) (14 eyes, 15.6%), subconjunctival hemorrhage (12 eyes, 13.0%), hyphema (11 eyes, 12.4%), bleb leak (8 eyes, 8.8%), encapsulated bleb (2 eyes, 2.2%), aqueous misdirection (1eyes, 1.1%), corneal epithelial defect (1 eyes, 1.1%), and overfiltration (1 eyes, 1.1%). There were no reported cases of endophthalmitis or blebitis. Hypotony was associated with serous CD (P = 0.006), and hyphema was associated with neovascular glaucoma (NVG) patients (P = 0.009). NVG was not associated with the increased rate of surgical failure (P = 0.083). Our study revealed that underlying diseases were diabetes mellitus in 12, hypertension in 17 and dyslipidaemia in 10 cases. Diagnosis was POAG in 20, POCG in 35, uveitic glaucoma in 15 and NVG in 18 cases. BCVA (logMAR) was 1.2 and IOP was 27.4 mm Hg. Song et al,[14] evaluated tonometric outcomes of patients with primary angle closure glaucoma (PACG) who have undergone trabeculectomy with mitomycin C (MMC) with and without concurrent phacoemulsification and to identify risk factors for post-operative failure. It comprised of 44 eyes of 33 phakic patients who underwent trabeculectomy with MMC with or without combined phacoemulsification for PACG. Mean intraocular pressure (IOP) decreased from 21.3±7.9 mmHg to 12.2±3.9 mmHg at 12 months (p1 minute were associated with decreased risk of surgical failure. Concurrent phacoemulsifcation at the time of trabeculectomy did not alter tonometric success or rate of complications.

It was seen that common complications were subconjunctival hemorrhage in 2, hypotony in 1, Hypotony with serous choroidal detachment in 4, encapsulated bleb in 3 and bleb leak in 1.

Jampel et al,[15] described the incidence of, and risk factors for, surgical complications reported during and within the first post-operative month after trabeculectomy in the Collaborative Initial Glaucoma Treatment Study (CIGTS). Among the 300 patients randomized to initial surgery, 465 trabeculectomies were performed. Intraoperative complications were reported in 55 eyes (12%). The most frequent reported complications were anterior chamber bleeding during surgery (37 eyes, 8%) and conjunctival buttonhole (five eyes, 1%). Early post-operative

complications were reported in 232 eyes (50%). Complications with a frequency over 10% included shallow or flat anterior chamber (62 eyes, 13%), encapsulated bleb (56 eyes, 12%), ptosis (55 eyes, 12%), serous choroidal detachment (52 eyes, 11%), and anterior chamber bleeding or hyphema (48 eyes, 10%).

Cruz et al,[16] found that 67% of the failed cases had CDR ≥ 0.8 and 61% of successful trabeculectomies had advanced damage. All trabeculectomies were performed with intraoperative MMC at a concentration of 0.4 mg/ml applied for 2 minutes. There were 3 shapes of sclera flaps created: triangular flap was the most common at 53.4%, followed by square flap at 28.4%, and trapezoid at 18.2%. Failure rates of the triangular, square, and trapezoid flaps were similar at 21.3%, 20%, and 18.8% respectively [Table 2]. The most common site chosen for the sceral flap was superonasal, with a failure rate of 20.5%. The samples for the superior and superotemporal sites were too small to make meaningful comparisons. All failed cases occurred with the conventional interrupted sutures to anchor the scleral flap to the bed, and none when releasable sutures were used. The limbus-based conjunctival flap was employed for 73.5% of surgeries with a success rate of 77.3%. The fornixbased approach had a slightly higher success rate at 85.2%. Most of the trabeculectomies were done by residents (63.7%), followed by fellows (18.6%), and consultants (17.6%). The residents had the highest failure rate (21.5%) followed by the fellows (26.1%) and the consultants (16.7%).

CONCLUSION

Hypotony with serous choroidal detachment was most common complication seen in patients undergoing trabeculectomy.

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