

## Outcomes Of Sutureless Phacotrabeculectomy In Patients Of Combined Cataract And Glaucoma

ArafAli, Abdul Gafoor Ahmed, Sheikh Sajjad Ahmed, Nusrat Shaheen, Wasim Rashid

### Abstract

**Background:-**The association of glaucoma with cataracts has become more frequent because of increase in life expectancy and the increased risk of cataract development in the patients with glaucoma. For this reason, and to reduce the trauma and the time taken for patient rehabilitation, the prevailing trend is to perform a combined procedure, taking care of both pathologies simultaneously.

**Material and Methods:-**The present prospective study was conducted in the Postgraduate Department of Ophthalmology SKIMS Medical College Bemina in 51 patients from October 2016 to April 2018. All patients underwent sutureless phacotrabeculectomy (Sheikh's Technique). Postoperative evaluation was done on the first postoperative day and thereafter at 1 week, 4 weeks, 2 months and 6 months.

**Results:-**Mean age of the patients was  $60.04 \pm 9.6$  years. 50% of patients were in age group 60-70 years. The post-operative mean intraocular pressure (mmHg) was  $13.67 \pm 5.28$  mmHg at 1 week,  $14.41 \pm 4.68$  mmHg at 1 month,  $14.53 \pm 5.52$  mmHg at 2 months, and  $14.71 \pm 4.1$  mmHg at 6 months. At the 6th month follow up visit, the mean number of antiglaucoma medications per treated eye was  $0.14 \pm 0.52$  which was a significant decrease from pre-op number ( $2.94 \pm 0.61$ ). In terms of snellen BCVA, most of the patients (80%) had a visual acuity of 6/18 or better at 6 month follow-up in the operated eye.

**Conclusion:-**sutureless phacotrabeculectomy is a safe and effective option in the management of cataract associated with glaucoma.

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### Introduction

Severe sepsis and septic shock are two major causes of death in Cataract and glaucoma are both age related diseases, so concurrent existence of cataract and glaucoma is common in elderly population. The WHO/NPCB (National programmer for control of blindness) survey has shown that there is backlog of over 22 million blind eyes in India, and 80% of these are due to cataract. The annual incidence of cataract blindness is about 3.8 million [1] It is estimated that there are more than 60 million cases of glaucoma worldwide and it will increase to 80 million by 2020.[2,3] The estimated prevalence of glaucoma is 2.65% in people above 40 years of age. It is estimated that more than 3 million people are blind due to glaucoma.[3] In India, the estimated number of cases of glaucoma is 12 million, around one fifth of the global burden of glaucoma.[4]

The association of glaucoma with cataracts has become more frequent because of increase in life expectancy and the increased risk of cataract development in the patients with glaucoma.

Moreover, the presence of cataract can affect the ability to assess glaucoma progression, and cataract extraction affects the intraocular pressure and effectiveness of glaucoma surgery. On the other hand, glaucoma surgery significantly increases the risk for the

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### Keywords:

Cataract, glaucoma, sutureless phacotrabeculectomy.

development of cataract. For this reason, and to reduce the trauma and the time taken for patient rehabilitation, the prevailing trend is to perform a combined procedure, taking care of both pathologies simultaneously. Recent developments in bimanual small incision phacoemulsification,[5-7]the latest improvements in trabeculectomy and non-penetrating filtering surgery and implant drainage devices[8]have favored this trend for doing a combined surgery Sutureless phacotrabeulectomy[9-14]has advantages over conventional combined phacotrabeulectomy, as it lessens,localirritation,foreign body reaction,scarring and fibrosis of conjunctival and scleral flaps,surgical induced astigmatism,tissue trauma and surgical manipulation will be less and there is early visual rehabilitation. The present study was done to assess the outcomes of suturelessphaco-trabeulectomy in terms of, visual rehabilitation, intraocular pressure control, and number of complications. We are also introducing a modified technique of suturelessphacotrabeulectomy known as SHEIKHs Technique.

**Material and Methods**

Prospective study was conducted in the Postgraduate Department of Ophthalmology SKIMS Medical College Bemina on 51 patients from October 2016 to April 2018.

**Inclusion Criteria**

1. Patient with borderline glaucomatous changes where intraocular pressure is not controlled with maximum tolerable medication.
2. Patients with poor compliance to medical therapy.
3. Medication use limited by allergy or medical contraindication.

**Exclusion Criteria**

1. Any previous conjunctival or intraocular surgery.
2. Secondary open angle glaucoma.
3. Patients with history of ocular trauma.
4. Presence of ocular inflammation.
5. Congenital glaucoma.
6. Patients with peripheral iridectomies or previous laser trabeculoplasty.

**SURGICAL PROCEDURE (SHEIKHs Technique**

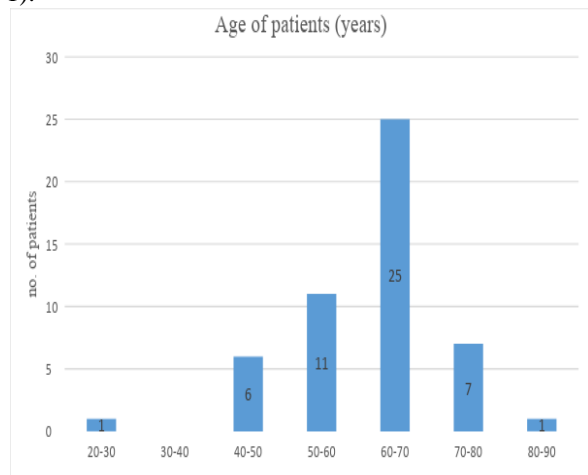
All surgeries were performed under peribulbar anesthesia. A single site approach was used; phacoemulsification and intraocular lens insertion were performed through what would become the site for trabeculectomy. A 2.8mm to 3.00mm incision in horizontal length, one third sclera thickness, 2.00 to 3.00mm from the limbus was created and advanced using a crescent blade in to the clear cornea for about 1.0 to 1.5mm. Phacoemulsification was completed using stop & chop technique. A scleral punch was used to remove part of the posterior internal lip.

An overlap of 1mm was allowed at the trabeculectomy site with the roof of the tunnel. The scleral flap was kept intact. A peripheral iridectomy

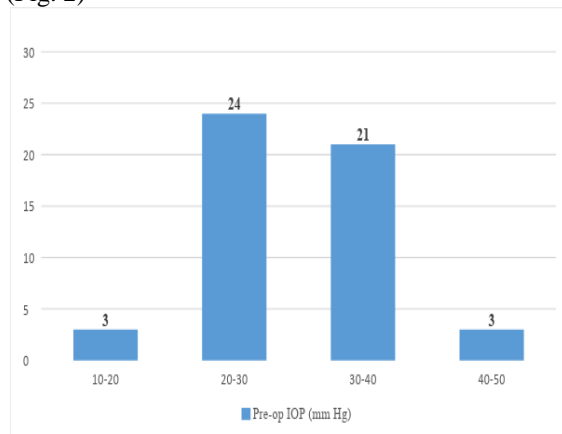
was fashioned and after reforming the anterior chamber, the conjunctival flap was sutured back with 10-0 nylon. Postoperative Evaluation was done on the first postoperative day and thereafter at 1 week, 4 weeks, 2 months and 6 months.

**Results**

51 eyes of 51 patients who underwent suturelessphacotrabeulectomy were included for the purpose of the study. Mean age of the patients was 60.04 s ±9.6 years ranging from 26 to 85 years (Fig. 1).



Thus almost 50% of patients were in age group 60-70 years. Among 51 patients, 27 (53%) were males and 24 (47%) were females. Right eye was operated in 26 (51%) patients and left eye in 25 (49%) patients. Pre-operative mean intraocular pressure was 29.57±6.83 mm Hg ranging from 16 to 44 mmHg (Fig. 2)

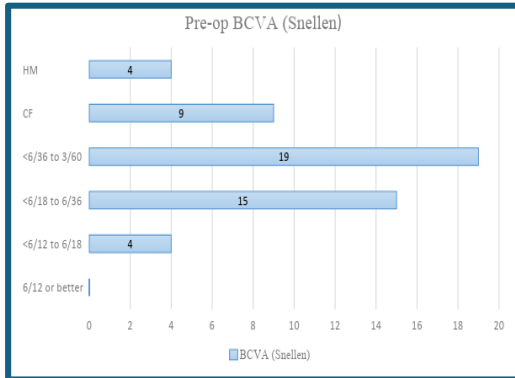


The mean pre-operative optic nerve vertical C/D ratio was 0.70 ± 0.14 ranging from 0.4 to 0.9 (Table 1)

Vertical optic nerve CD ratio	No. of patients	Percent age
0.4	1	2
0.5	7	14
0.6	13	25
0.7	11	21
0.8	9	18
0.9	10	20

Table1.

The mean pre-op best-corrected visual acuity was 1.21 logMAR units with a SD of 0.61. (Fig. 3)



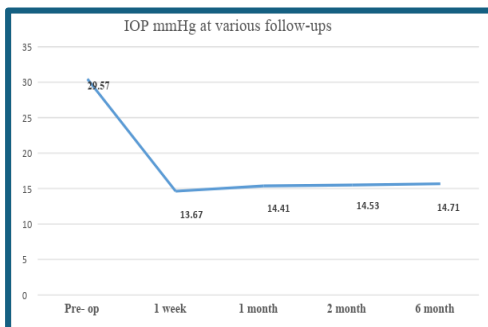
Thus 63% of patients had vision worse than 6/36. The average number of drugs used pre-operatively was  $2.94 \pm 0.61$  ranging from 2 to 4. (Table 2)

No. of drugs used pre-op	No. of patients	Percentage
2	11	21
3	32	63
4	8	16

The post-operative mean intraocular pressure (mmHg) was  $13.67 \pm 5.28$  mmHg at 1 week,  $14.41 \pm 4.68$  mmHg at 1 month,  $14.53 \pm 5.52$  mmHg at 2 months, and  $14.71 \pm 4.1$  mmHg at 6 months (Table 3).

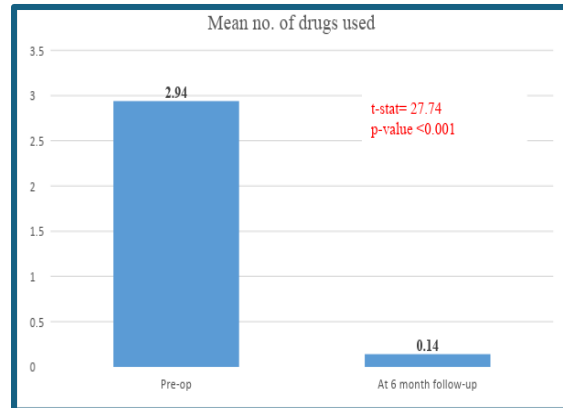
Post-op IOP (mm Hg)	1 week No. of patients	1 month No. of patients	2 month No. of patients	6 month No. of patients
0-10	9	4	3	1
10-20	32	39	43	46
20-30	10	8	4	3
30-40	0	0	0	1
40-50	0	0	1	0

The reduction in IOP from pre-op value was significant at each follow-up (Fig. 4)

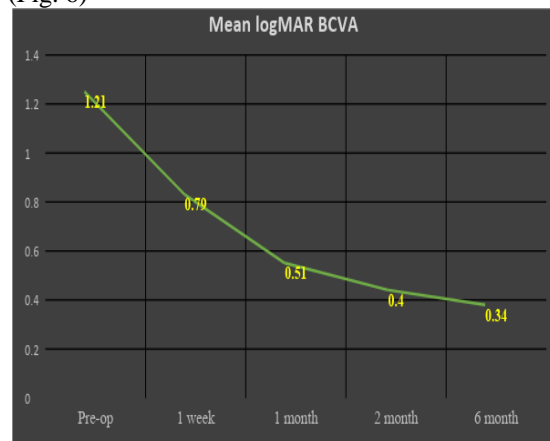


At the 6th month follow up visit, the mean number of antiglaucoma medications per treated eye was  $0.14 \pm$

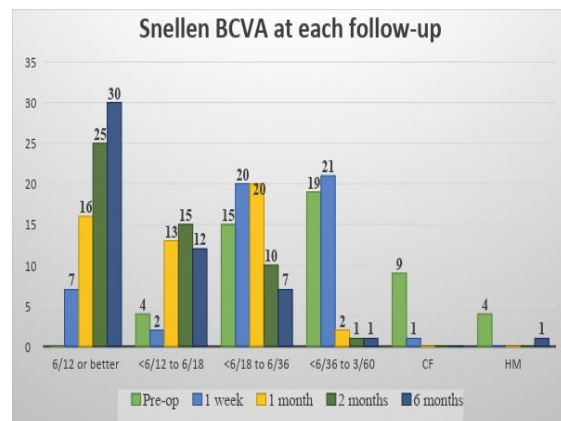
$0.52$  which was a significant decrease from pre-op number ( $2.94 \pm 0.61$ ) [Fig. 5]



There was a significant improvement in mean logMAR visual acuity at each follow (Fig. 6)



In terms of snellen BCVA, most of the patients (80%) had a visual acuity of 6/18 or better at 6 month follow-up in the operated eye. One patient had lost his vision to optic atrophy at 6 month follow-up (Fig. 7)



Bleb was visible in 39 patients (76%) at 6 month follow-up. Visual field analysis was not possible in most of the patients pre-operatively because of low vision. But post-operatively almost all of them showed some sort of glaucomatous visual field loss, with many of them having advanced field loss.

**Table 4 Showing Complications during our study.**

Complication	Day 1	1 week	1 month	2 months	6 months
Corneal edema/striate keratopathy	10	1	0	0	0
Hypotony with or without shallow AC	5	2	1	0	0
Hyphaema	1	0	0	0	0
Uveitis	2	2	0	0	0
Raised IOP	5	5	4	3	2
Blebitis	0	0	0	0	0

Early complications such as uveitis, mild hypotony, corneal edema and transient hyphaema resolved with conservative management. No case of Blebits or endophthalmitis was seen in our study.

**Discussion**

Trabeculectomy combined with cataract surgery is considered safe and effective in the management of cataract associated with glaucoma. It prevents early intraocular pressure spikes which are responsible for visual field “wipe out” in advanced glaucoma and provides visual rehabilitation and long term intraocular pressure control.[15]Combining the two surgeries not only enhances the vision of the patients but also provides independence from multiple glaucoma drugs and frequent follow ups thus improving the quality of life.[16]

In our study we performed suturelessphacotrabeculectomy (SHEIKHS TECHNIQUE) through the same incision. Without suturing, the amount of surgical manipulation and trauma will be less. The absence of suture material in the scleral flap minimizes local tissue irritation and foreign body reaction. The risk of suture tract abscess is also omitted. Furthermore, the sutureless technique may induce less postoperative astigmatism.

In the absence of suture material, local irritation and foreign body reaction reduces, leading to less fibrosis and scaring of conjunctival and scleral flaps. Also, notpassing a needle through the scleral flap minimizes tissue trauma and could decrease the incidence of intraoperative hyphaema. The risk of suture associated complications such as button holing through the conjunctival filtration bleb or suture tract abscess formation, which might lead to an increased chance of endophthalmitis, is removed.[17] The incidence of “wipe out” syndrome correlated positively to number of sutures used in scleral flap closure, as demonstrated by Costa et al.[18]Using suturelessphacotrabeculectomy incisions might theoretically protect against this complication.

In our study we have found that the intraocular pressure was significantly reduced in majority of patients undergoing suturelessphacotrabeculectomy. The mean intraocular pressure at the end of six

months was 14.71±4.1 mmHg which represents a percentage decrease of 49.74% from the preoperative values. The results are comparable with the studies done by other workersCaginiC et al[19],Gous PN et al[17],Kim JW et al[20].

In our study the number of medications used decreased from a mean of 2.94 preoperatively to 0.14 postoperatively, which is a significant decrease (p<0.001). The results are comparable with other studies. **GousPN et al[17].**

Our study was based on sutureless tunnel technique and it has several advantages. The amount of surgical manipulation and tissue trauma is less. Only 1 patient had hyphaema in our study. Due to less tissue trauma there are less chances of intraoperative hyphaema as is shown in our study in which only one patient developed minimal hyphaema. Postoperative manipulation of sutures such as suture release or laser suture lysis carry an additional risk of complications like conjunctival perforation,[21] sudden hypotony, shallow anterior chamber and malignant glaucoma.[22]The rate of aqueous filtration and correct tension in the trabeculectomy scleral flaps is regulated by sutures in conventional surgeries, leading to inter-individual and inter-procedural variations. Using an intact scleral roof as in our sutureless technique seems to be a unique way of anatomically standardizing the filtration fistula.

In our sutureless scleral tunnel incision most of the aqueous outflow was directed towards a single outflow channel instead of a two or three sided scleral flap with multiple outflow channels. The greater the amount of outflow through a fistula more likely it is to remain patent. A critical amount of bulk flow is necessary to maintain patency of the fistula, with a single outflow channel as in our technique there are more chances of fistula remaining patent than in traditional methods where random filtration occurs on either sides of flap.[23] We did not encounter any case of blebitis or endophthalmitis in our study. Low rates of infection after sutureless surgery have been reported [24]and this could again be attributed to less tissue manipulation, less surgical time and absence of suture tract abscess.

**Limitation**

Although the study has many strong points, there were also some limitations associated with our study. The study being a hospital based study cannot be applied to the general population. Our patient cohort was small and we should have included larger number of patients in order to confirm our findings. Due to short follow up period, long term bleb survival is still questionable.

**Conclusion**

The optimal surgical approach for cataract patients with coexisting glaucoma is still under evolution, however suturelessphacotrabeculectomy is a safe and effective option in the management of cataract associated with glaucoma. Combining the two surgeries not only enhances the vision of the patients

but also provides independence from multiple glaucoma drugs and frequent follow ups thus improving the quality of life.

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