

SINGLE SITE COMBINED SMALL INCISION CATARACT SURGERY AND TRABECULECTOMY- ANALYSIS OF OUTCOME AND BENEFITS AT GOVERNMENT TIRUVARUR MEDICAL COLLEGE

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ABSTRACT

BACKGROUND

Cataract and Primary Open Angle Glaucoma (POAG) are the leading causes of painless progressive loss of vision in the world. Surgery is the most productive and cost-effective treatment for patients suffering from Cataract and POAG. As the incidence and prevalence of Cataract with POAG is on the rise, the requirement of more skilful surgeons specialized in combined surgery is the need of the hour.

The objectives of this study were- 1) to develop a simple and effective technique in surgical treatment for cataract and glaucoma. 2) to make it easier to transform from being a cataract surgeon alone to a combined cataract and glaucoma surgeon. 3) To compare the outcome of single site cataract surgery and trabeculectomy over two site surgery.

MATERIALS AND METHODS

Over two-years period, 30 patients diagnosed as cataract with primary open angle glaucoma underwent single site or two site combined small incision cataract surgery and trabeculectomy and were subjected to IOP measurement before and after surgery. The mean Intraocular pressure before and after surgery was compared to arrive at the results. Intra-operative and immediate post-operative complications are noted. Filtering bleb formation is noted.

RESULTS

Reduction of mean IOP by 5.7 mmHg (22%) in the single site surgery group compared to simple trabeculectomy and two site surgery was seen. No significant intra-operative and post-operative complications were experienced in single site surgery. Filtering bleb formation is seen in all cases who underwent single site surgery in the immediate post-operative period.

CONCLUSION

The single site combined small incision cataract surgery and trabeculectomy is an effective, easier and less time-consuming technique that can be mastered by every sutureless cataract surgeon.

KEYWORDS

Glaucoma, Cataract, Small Incision Cataract Surgery, Trabeculectomy, Single Site Surgery, IOP.

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BACKGROUND

Cataract and Primary Open Angle Glaucoma (POAG) are the leading causes of painless progressive loss of vision in the world.¹ With the increase in the prevalence of diabetes, the incidence and prevalence of the simultaneous occurrence of Cararact and Primary Open Angle Glaucoma (POAG) is on the rise.² Medical therapy is still the first-choice treatment for POAG. Due to the high cost of drug therapy and poor complaine of the patients to medical therapy,³ surgery is

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the most productive and cost-effective treatment for patients suffering from POAG, particularly with co-existing Cataract.

In the era of sutureless cataract surgery, whenever combined cataract and Glaucoma surgery is done, it is customary to do each procedure at different sites. Cataract incision is usually done at supero-temporal site and scleral flap for trabeculectomy at 12'0 clock position. Scleral flap designing takes a steep learning curve. It has been really cumbersome to complete the procedure by the beginners and time consuming for experts. As the incidence and prevalence of Cataract and POAG is on the rise, the requirement of more skilful Surgeons specialized in combined Surgery is the need of the hour. In this study, single site and two site⁴ combined small incision cataract surgery and trabeculectomy are done and the comparison⁵ of their outcomes and benefits done.

Aims and Objectives

1. To develop a simple and effective technique in surgical treatment for Cataract and Glaucoma.
2. To make it easier to transform from being a Cataract surgeon alone to a combined Cataract and Glaucoma Surgeon.
3. To compare the outcome of Single Site cataract surgery and Trabeculectomy over Two site surgery.

Inclusion Criteria

Patients with Cataract and Primary Open Angle Glaucoma with poor response and compliance to drug therapy with no other ocular pathology.

Exclusion Criteria

Patients with other types of Glaucoma. Patients with other ocular pathology.

MATERIALS AND METHODS

In the technique followed here, surgeon can take a fornix based or limbal based conjunctival flap as desired. Unlike in a simple Small Incision Cataract Surgery, where we design a sclero-corneal tunnel incision, here a pure 3mm x 7mm scleral tunnel incision is designed at the superior limbus. Rest of steps is carried as usual for simple cataract surgery. After finishing the cataract surgery, the rectangular scleral flap is designed by simply cutting the anterior scleral flap of the scleral tunnel 2mm on either side of 12’0 clock meridian upto the limbus using a corneal / Vanna’s scissors. Rest of the steps in trabeculectomy is the same.

Over two years period 30 Patients diagnosed as Cataract and Primary Open Angle Glaucoma were subjected to this study. Randomly 15 patients underwent the two-site procedure and other 15 patients were subjected to the single site surgery. Intra ocular pressure (IOP) measurement done before surgery and 45 days after surgery. The mean Intra-ocular pressure before and after surgery compared to arrive at the results. Intra-operative and immediate post-operative complication are noted. Filtering bleb formation in the immediate post-operative period is noted. The results were compared between the two groups and literature.

RESULTS

The 30 patients involved in this study had a mean Intraocular pressure of 25.8 ± 2.2 mm of Hg pre-operatively. Post-operatively the mean Intraocular Pressure measured as 20.6 ± 1.7 mm of Hg in the two-site surgery and 20.1 ± 1.6 mm of Hg in single site surgery respectively. Button holing of scleral flap experienced in three patients in two site surgery. Post-operative striate keratopathy seen in five patients in two site surgery. No significant intra-operative and post-operative complication experienced in single site surgery. Aqueous drainage conjunctival bleb (filtering bleb) was seen in 9 patients who underwent single site procedure compared to only 5 patients who underwent two site procedure on the immediate post-operative day. Filtering bleb formation subsequently occurred in all the patients in the next few days following the first post-operative period.

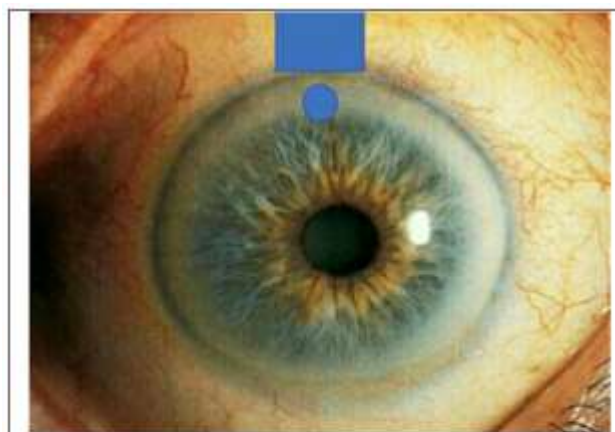


Image 1. Depicted Picture of Plain Trabeculectomy showing Scleral Flap at 12’0 Clock Position and Peripheral Iridectomy

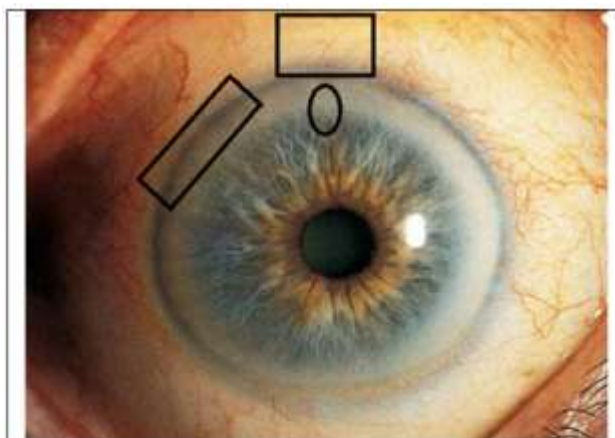


Image 2. Depicted Two Site Surgery –SICS+ TRABECULECTOMY- Showing Supero Temporal Sclero-Corneal Tunnel Incision, Scleral Flap at 12’0 Clock Position and Peripheral Iridectomy

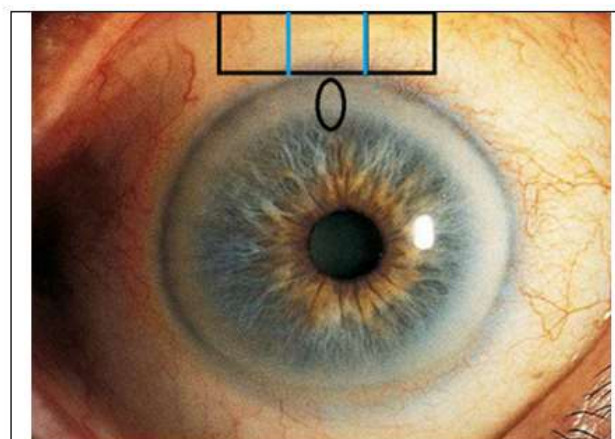
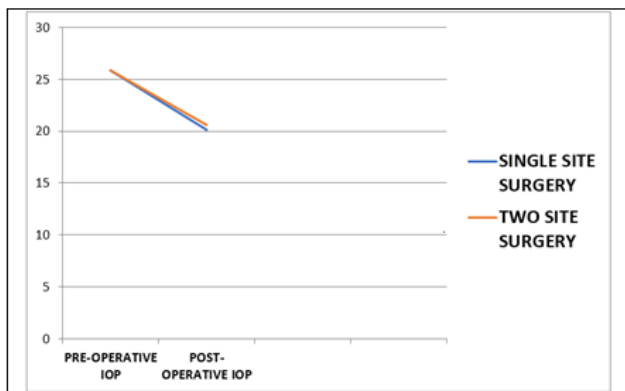
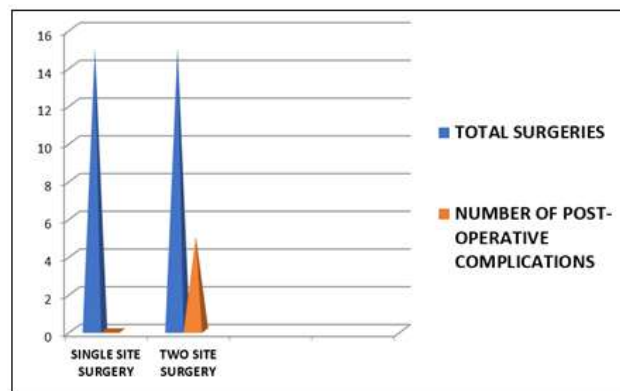


Image 3. Depicted Single Site Surgery – SICS + TRABECULECTOMY- Showing Pure Scleral Tunnel Incision at the Superior Limbus, Scleral Flap Fashioned in the Anterior Wall of the Scleral Tunnel (Blue Lines) and Peripheral Iridectomy



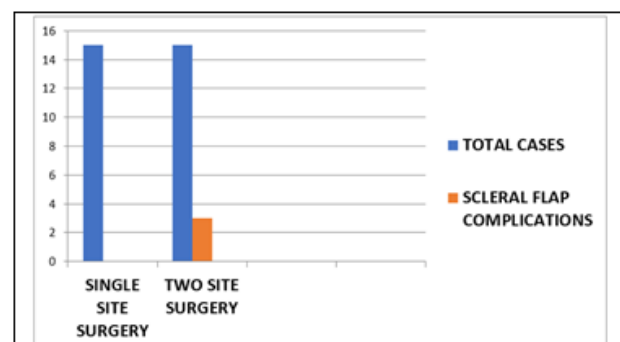
Graph 1. Comparison of IOP Reduction between Single Site and Two site Surgery



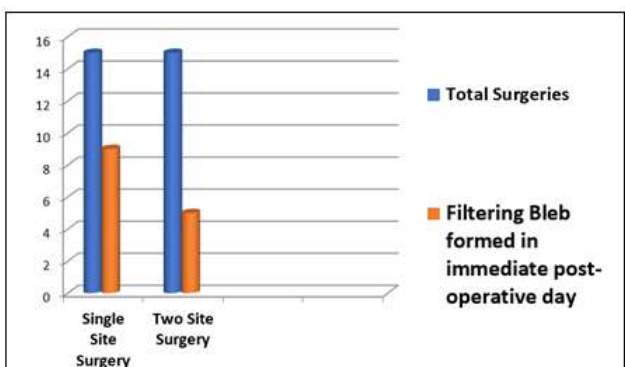
Graph 3. Comparison of Post-operative Striate Keratopathy between Single Site and Two Site Procedure

Procedure	Plain Trabeculectomy	Two Site Surgery	Single Site Surgery
% of Reduction In IOP	20.8%	20%	22%

Table 1. Comparison of Percentage of IOP Reductions



Graph 4. Comparison of Scleral Flap Complications between Single Site and Two Site Procedure



Graph 2. Filtering Bleb Formation Comparison between Single Site and Two Site Surgery on the Immediate Post-operative Day

Surgical Technique	Total Cases	Scleral Flap Complications	Striate Keratopathy	Filtering Bleb Formation on 1 st Post-Operative Day
Single Site	15	NIL	NIL	9
Two Site	15	3	5	5

Table 2. Complications and Filtering Bleb Formation Comparison

DISCUSSION

In Single site combined Glaucoma and Small Incision Cataract surgery,⁶ reduction of mean IOP by 5.7 mm of Hg (22%) in the study group. This is better than 20.8% reduction quoted in the literature following plain trabeculectomy.⁷ The common complications seen during trabeculectomy scleral flap designing⁸ like button-holing of the scleral flap and flap tear is not seen in this technique as the scleral flap is designed in the anterior wall of the sclera tunnel. Complications like striate keratopathy seen commonly in plain trabeculectomy⁹ is also not seen in this study, as the surgical approach is posterior to the limbus and endothelial touch is avoided. Diffuse Filtering bleb formation

is seen in all cases in the immediate post-operative period as quoted in the literature.¹⁰

Reduction of mean IOP by 5.7 mm of Hg (22%) in the patients who underwent single site surgery compared to a reduction of 5.2 mm of Hg (20%) in two site procedure. 10% more reduction in IOP achieved in a single site surgery.⁷ The complications like button-holing of the scleral flap and flap tear was not seen in single site surgery,⁸ whereas it was experienced in 3 patients (20%) in two site surgery. Post-operative striate keratopathy was seen in 5 patients (33.33%) in two site surgery compared to none in the single site surgery.⁹ Filtering bleb on the immediate post-operative day was observed in 5 patients (33.33%) in two site surgery

compared to 9 patients (60%) in single site surgery.¹⁰ Filtering bleb formation subsequently occurred in all the patients in the next few days following the first post-operative period.¹⁰

CONCLUSION

The single site combined small incision cataract surgery and trabeculectomy is as effective a technique as the other surgical techniques in reducing the intraocular pressure to the desired level. The post-operative complications in single site surgery is insignificant compared to two site procedure. Filtering bleb formation occurs earlier in single site procedure compared to two site surgery. The most important benefit of this single site surgery is learning curve is shorter and every sutureless cataract surgeon can transform to a combined small incision cataract surgery and trabeculectomy surgeon with ease. Even the skilful experienced surgeons will find this technique easier, less time consuming, and can be done without any complications.

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