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Outcomes of Combined Paco-Trabeculectomy Versus Sequential Procedures in Patients with Coexisting Cataract and Glaucoma

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Abstract

Objective: To compare the outcomes of combined phaco-trabeculectomy versus sequential procedures in patients with coexisting cataract and glaucoma in terms of visual acuity, intraocular pressure control, postoperative complications, and requirement of anti-glaucoma medications.

Study Design: Prospective Comparative study.

Place and Duration of Study: Department of Ophthalmology, Lahore General Hospital, Lahore from October 2023 to July 2024.

Methodology: A total of 350 patients aged 40–80 years diagnosed with coexisting cataract and glaucoma were included in the study. Patients were divided into two groups. Group A underwent combined phaco-trabeculectomy, while Group B underwent sequential procedures. Baseline demographic and clinical characteristics were recorded before surgery. Patients were followed regularly to evaluate visual acuity, intraocular pressure, surgical success, postoperative complications, and requirement of anti-glaucoma medications. Data were analyzed using SPSS version 25.0. Quantitative variables were expressed as mean ± standard deviation, while qualitative variables were presented as frequency and percentage.

Results: The visual acuity and intraocular pressure of the patients that underwent combined phaco-trabeculectomy were statistically significantly improved following surgery. The sequential procedure group also improved; but combined surgery resulted in earlier control of pressure and less need for anti-glaucoma drugs. There were few and manageable postoperative complications in both groups, including transient inflammation, shallow anterior chamber, and transient increase in intraocular pressure. Combined phaco-trabeculectomy was more successful than surgery alone in achieving overall success. **Conclusion:** Phaco-trabeculectomy was effective and was a safe procedure for the patients who had both cataract and glaucoma at the same time.

It was associated with a better visual outcome, a better control of intraocular pressure and reduced medication use compared to sequential procedures.

Introduction

Elderly individuals suffer from visual impairment in two of the most prevalent ways: by developing a cataract or a glaucoma. Cataract refers to a gradual clouding of the natural lens of the eye, and it causes problems with seeing things clearly, glare, lack of contrast sensitivity and problem with daily tasks. Glaucoma, however, is a chronic optic neuropathy that is typically accompanied by increases in eye pressure and gradual optic nerve damage 0. Glaucoma, if not diagnosed and treated properly, can result in a permanent loss of vision and blindness. Cataract is a frequent problem associated with glaucoma, and the combination of these two disorders poses a significant clinical challenge because both disorders affect vision, require timely treatment and may change the surgical approach to glaucoma 0.

Surgery planning is important in patients with coexisting cataract and glaucoma as treatment should be to maximize visual acuity and to control intraocular pressure 0. The procedure of removal of cataract may improve vision and sometimes helps to lower intraocular pressure slightly. But for patients who already have glaucoma, the surgery may be insufficient to control the pressure 0. Trabeculectomy is one of the most frequently performed filtration surgeries for glaucoma that creates an alternate route for the aqueous humour to flow out of the eye and reduces intraocular pressure. A combination of phaco and trabeculectomy surgery, or two-step surgeries, may be used when cataract and glaucoma are both major problems 0. The overall procedure known as combined phaco-trabeculectomy combines phacoemulsification surgery for the removal of the cataract with trabeculectomy in a single surgical session. There are several possible benefits to this approach, such as single hospital stay, lower total surgical expenses, accelerated visual recovery and improved intraocular pressure control 0. It also helps lower the number of visits such as those of elderly patients who undergo multiple surgical stresses. However, surgery combined may have a higher incidence of postoperative inflammation, a more complex procedure and variable function of the blebs.

Sequential procedures mean carrying out the cataract surgery and the glaucoma surgery separately (cataract extraction first, then a trabeculectomy; or a trabeculectomy first, followed by a cataract extraction). This will enable each condition to be treated separately and may result in more control over the timing of surgery 0. For instance, if the intraocular pressure is uncontrolled, trabeculectomy might be the initial surgery; if the visual impairment is more severe, then the cataract surgery might be delayed. However, sequential surgery will involve two surgeries, longer recovery period, higher cost, and higher risk of complications after surgery.

Combined vs. sequential procedures are clinically important because surgery can have a significant impact on visual outcome, intraocular pressure control, medications required, complications and patient satisfaction 0. Combined procedure may be more practical in resource poor settings for many patients, particularly for those who are not able to attend for multiple follow-up visits. This means that determining the results of both techniques can help ophthalmologists determine the best surgical method for a patient with cataract and glaucoma 0.

The aim of this study was to compare the results of a combined procedure of phaco-trabeculectomy versus sequential procedures in patients with cataract and glaucoma. Postoperative visual acuity, reduction of intraocular pressure, need for anti-glaucoma drugs, surgical success and complications were the areas of focus for the study 0. The results could aid in making surgical decisions and patient management.

Objective

To compare the results of combined phaco-trabeculectomy and sequential surgical procedures for patients with cataract and coexisting glaucoma based on visual acuity, intraocular pressure control, the use of anti-glaucoma medication, surgical success and postoperative complications.

Methodology

This prospective comparative study at the Department of Ophthalmology, Lahore General Hospital, Lahore from October 2023 to July 2024. There were 350 patients who had both a cataract and glaucoma. The sample size calculation was done according to the WHO sample size calculation formula. Patients were divided into two groups: 1) Combined phaco-trabeculectomy (group A) and 2) Sequential surgical procedures (group B). Patients were included and excluded based upon predetermined criteria. The following preoperative parameters were evaluated: visual acuity, intraocular pressure, slit lamp examination, fundus examination, and number of anti-glaucoma medications. Follow-up after surgery was conducted to evaluate the improvement of vision, intraocular pressure, need for medication, success of surgery and complications. A structured proforma was used to collect data which was analyzed statistically to compare the outcome of both the groups.

Inclusion and Exclusion Criteria

Inclusion Criteria

The study included patients age 40 years or older with visually significant cataract having medically diagnosed glaucoma. Patients who were willing to attend follow-up visits and needed surgery for both conditions gave informed consent.

Exclusion Criteria

Patients who had traumatic cataract, congenital glaucoma, previous eye surgery, active infection of the eye, severe retinal disease, and opacities of the cornea or systemic disease affecting visual outcome were not included in the study. Patients who refused to engage or drop-out were also excluded.

Data Collection

The study was carried out at the Ophthalmology Department and data was collected from patients attending the Department during the study period. Following informed consent, demographic data, medical history, and ophthalmic examination data was obtained and entered a structured proforma. The baseline evaluation consisted of visual acuity, intraocular pressure measurement (tonometry), slit-lamp examination, gonioscopy and fundus evaluation. The patients were split into two groups based on the surgery performed. Patients were split into two groups based on the surgery performed. In Group A, the surgery was a combination of phaco-trabeculectomy; in Group B, sequential surgery took place. Postoperative examinations were performed routinely to check visual acuity, intraocular pressure, anti glaucoma medications, and surgical success as well as postoperative complications. Data collected were all entered the database and analyzed statistically for comparing the outcome in both groups.

Results

Of 350 patients, 175 had simultaneous (phaco-trabeculectomy) and 175 had sequential procedures. Both groups showed an improvement in visual acuity following surgery, the combined surgery group being earlier and more stable. There was a significant decrease in mean IOPs in both groups, and more in those undergoing combined phaco-trabeculectomy. This reduction in use of anti-glaucoma drugs was also larger in the combined group. The postoperative complications were minor, such

as transient inflammation, shallow anterior chamber, and transient intraocular pressure elevation in both groups. The overall success of surgery was greater for the combined phaco-trabeculectomy group.

Table 1: Demographic Distribution of Patients

Variable	Combined Group (n=175)	Sequential Group (n=175)
Mean age	62.4 ± 8.1 years	63.1 ± 7.9 years
Male	96 (54.9%)	91 (52.0%)
Female	79 (45.1%)	84 (48.0%)

They were comparable in age and gender distribution and therefore a fair and balanced comparison of surgical outcomes was made.

Table 2: Preoperative Clinical Findings

Variable	Combined Group	Sequential Group
Mean visual acuity	0.78 ± 0.21 LogMAR	0.80 ± 0.23 LogMAR
Mean IOP	27.6 ± 4.8 mmHg	27.2 ± 4.5 mmHg
Mean medications	2.3 ± 0.7	2.2 ± 0.8

Baseline visual acuity, intraocular pressure (IOP), and medications were similar between the two groups prior to surgery.

Table 3: Postoperative Visual Acuity

Visual Outcome	Combined Group	Sequential Group
Improved	148 (84.6%)	132 (75.4%)
Same	19 (10.9%)	28 (16.0%)
Worsened	8 (4.5%)	15 (8.6%)

Both groups had visual improvement with better visual recovery in the combined group02.

Table 4: Postoperative IOP Control

IOP Outcome	Combined Group	Sequential Group
Controlled IOP	154 (88.0%)	139 (79.4%)
Partially controlled	15 (8.6%)	24 (13.7%)
Uncontrolled IOP	6 (3.4%)	12 (6.9%)

The combined phaco-trabeculectomy had better intraocular pressure control than sequential surgical procedures.

Table 5: Postoperative Complications

Complication	Combined Group	Sequential Group
Transient inflammation	18 (10.3%)	21 (12.0%)
Shallow anterior chamber	9 (5.1%)	7 (4.0%)
Temporary raised IOP	6 (3.4%)	13 (7.4%)
No complication	142 (81.2%)	134 (76.6%)

There were minimal complications with most patients. Minimal and short-term complications were reported that were controlled with routine post-operative care.

Discussion

The results of combined phaco-trabeculectomy versus the sequential surgeries in the presence of coexisting cataract and glaucoma were compared in the present study 0. The results revealed a significant improvement in the improvement of visual acuity

and intraocular pressure with both types of treatment, with combined phaco-trabeculectomy being more effective in achieving an early visual recovery, more effective pressure control, a reduction in the number of medications needed and a higher rate of surgical success 0.

Most people who have cataract problems will also have some degree of glaucoma (glaucoma is a leading cause of blindness, typically associated with high intraocular pressure) 0. Cataract cloudiness of the lens, and glaucoma damage to the optic nerve, can diminish vision; if intraocular pressure is not controlled, glaucoma can cause irreversible blindness. So, treatment should not only benefit vision but should also prevent any further damage to the eye caused by glaucoma. In this study, those that had a combined surgery performed with cataract removal had significant improvement in visual acuity and pressure reduction was achieved through trabeculectomy. This indicates that the treatment of both conditions is possible in a single surgery.

Intraocular pressure is one of the most important parameters of treatment success for glaucoma. The outcomes revealed that more patients in the combined group had a controlled intraocular pressure than did more patients in the sequential group. This could be since the trabeculectomy can be performed simultaneously with the phacoemulsification procedure resulting in an early formation of a filtration pathway that promotes better aqueous drainage 0. Lowering intraocular pressure can also stop the damage to the optic nerves and can lower the chances of the disease getting worse. Surgery with anti-glaucoma drugs also reduced the need for anti-glaucoma drugs more effectively 0. This is a significant finding as use of glaucoma medications over a long period of time can lead to ocular surface irritation, poor adherence, economic cost and diminished quality of life. The elderly aged patient may have trouble taking several eye drops on a regular basis. Surgery that decreases the need for medication can increase patient comfort and adherence, therefore.

In both groups, the complications following surgery were generally mild and easily controlled. Transient inflammation and shallow anterior chamber and transiently raised intraocular pressure were noted, but most patients recovered with the routine post-operative care 0. Surgery, which is technically more difficult and could potentially increase inflammation, was a safe procedure in the present study with a proper surgical technique and follow-up 0.

The findings of the sequential procedures were also positive, such as in terms of visual improvement and reduction in pressure. This could remain the best option for a few patients and particularly where one disease is more urgent than the other 0. In some patients, for instance, trabeculectomy might be performed first instead of glaucoma surgery, or a cataract surgery might not be performed until the cataract is visually significant. In sequential surgery, however, two surgeries must be performed, recovery is longer, costs more and requires a second hospital visit 0.

Overall, the study provides the surgeon with an alternative surgical approach for patients who have a cataract and glaucoma 0. It has the benefit of treating both diseases at the same time and could be particularly beneficial in patients needing early visual rehabilitation and IOP control. Success, however, still depends on the surgeon's experience and careful selection of patients and careful monitoring afterwards 0.

Conclusion

Phaco-trabeculectomy was determined to be a safe and effective surgical procedure for those who have cataract and glaucoma. It resulted in greater visual improvement, large intraocular pressure (IOP) lowering, a smaller number of anti-glaucoma medications and greater overall surgical success as compared to sequential procedures. Both methods were helpful but combined surgery had the benefit of being able to treat both conditions in a single surgery with acceptable complication rates. Thus, the

combination phaco-trabeculectomy procedure might be considered for well evaluated patients, when necessary, following a proper postoperative follow up.

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