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RESEARCH ARTICLE

COMPARATIVE STUDY OF PHACO-TRABECULECTOMY AND SMALL INCISION CATARACT SURGERY TRABECULECTOMY IN 50 CATARACT PATIENTS

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Abstract

Objective: To compare the clinical outcomes and complications of phaco-trabeculectomy and small incision cataract surgery (SICS) trabeculectomy in patients with cataracts.
Methods: A prospective study was conducted involving 50 cataract patients divided into two groups: 25 patients underwent phaco-trabeculectomy and 25 underwent SICS trabeculectomy. Preoperative and postoperative parameters such as intraocular pressure (IOP), visual acuity (VA), surgical time, and complication rates were analyzed.
Results: The study showed that both phaco-trabeculectomy and SICS trabeculectomy effectively reduced intraocular pressure and improved visual acuity. However, phaco-trabeculectomy had a significantly shorter surgical time and fewer postoperative complications compared to SICS trabeculectomy.
Conclusion: Phaco-trabeculectomy offers better safety and efficacy compared to SICS trabeculectomy, making it a preferable choice for managing cataract patients requiring trabeculectomy.

Introduction:-

Cataracts and glaucoma often coexist, necessitating a surgical approach that addresses both conditions simultaneously. Phaco-trabeculectomy and SICS trabeculectomy are two surgical techniques that have gained prominence in managing cataracts with coexisting glaucoma.

Phaco-trabeculectomy combines phacoemulsification and trabeculectomy, offering the advantage of minimal invasiveness and quicker recovery. In contrast, SICS trabeculectomy, while effective, may be associated with a longer recovery time and higher complication rates.

This study aims to provide a comparative analysis of the two surgical techniques in terms of intraocular pressure control, visual acuity improvement, surgical time, and postoperative complications, offering insights into the optimal surgical choice for cataract patients with glaucoma.

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Methodology:-

Study Design

A prospective, randomized study was conducted at DVVPF's Medical College &Hospital between December 2023 and November 2024. The study included 50 cataract patients diagnosed with coexisting glaucoma.

Patient Selection

- **Inclusion Criteria**:
  - Patients aged 50-80 years with confirmed cataract and glaucoma.
  - No previous ocular surgery.
  - Informed consent obtained.
- **Exclusion Criteria**:
  - Secondary glaucoma.
  - Advanced diabetic retinopathy.
  - Other ocular comorbidities affecting vision.

Surgical Procedures

- **Phaco-Trabeculectomy Group (n=25)**:
  - Standard phacoemulsification with foldable IOL implantation.
  - Trabeculectomy performed with mitomycin-C application.
  - Sutures applied as required.
- **SICS-Trabeculectomy Group (n=25)**:
  - Manual small incision cataract surgery with rigid IOL implantation.
  - Trabeculectomy with mitomycin-C.
  - Suturing according to standard protocol.

Outcome Measures

1. **Intraocular Pressure (IOP)**: Measured preoperatively, and postoperatively at 1 week, 1 month, 3 months, and 6 months using Goldmann applanation tonometry.
2. **Visual Acuity (VA)**: Assessed using Snellen's chart at the same intervals.
3. **Surgical Time**: Recorded from incision to the closure of the surgical site.
4. **Complications**: Documented intraoperative and postoperative complications, including hyphema, shallow anterior chamber, and infection.

Statistical Analysis

Paired t-test was used to compare preoperative and postoperative IOP and VA within each group. An independent t-test was utilized to compare outcomes between the two groups. A p-value < 0.05 was considered statistically significant.

Results:-

Demographics and Baseline Characteristics

Parameter	Phaco-Trab Group (n=25)	SICS-Trab Group (n=25)	p-value
Age (mean ± SD)	67.4 ± 8.2	68.1 ± 7.5	0.721
Male/Female Ratio	14/11	13/12	0.793
Preoperative IOP (mmHg)	23.8 ± 2.4	24.1 ± 2.1	0.598
Preoperative VA (logMAR)	0.54 ± 0.12	0.56 ± 0.11	0.455

Intraocular Pressure (IOP) Reduction

Time Point	Phaco-Trab Group (mmHg)	SICS-Trab Group (mmHg)	p-value
Preoperative	23.8 ± 2.4	24.1 ± 2.1	0.598
1 Week Post-op	15.3 ± 1.8	16.5 ± 2.0	0.032*
1 Month Post-op	14.9 ± 1.7	16.2 ± 1.8	0.017*
3 Months Post-op	14.5 ± 1.6	15.9 ± 1.7	0.014*

6 Months Post-op	14.3 ± 1.5	15.7 ± 1.6	0.011*

*Statistically significant at $p < 0.05$.

Visual Acuity Improvement

Time Point	Phaco-Trab Group (logMAR)	SICS-Trab Group (logMAR)	p-value
Preoperative	0.54 ± 0.12	0.56 ± 0.11	0.455
1 Week Post-op	0.38 ± 0.10	0.42 ± 0.12	0.094
1 Month Post-op	0.34 ± 0.09	0.39 ± 0.11	0.047*
3 Months Post-op	0.32 ± 0.08	0.37 ± 0.10	0.039*
6 Months Post-op	0.31 ± 0.07	0.36 ± 0.09	0.034*

*Statistically significant at $p < 0.05$.

Surgical Time

Parameter	Phaco-Trab Group (minutes)	SICS-Trab Group (minutes)	p-value
Surgical Time	45.2 ± 6.4	59.1 ± 7.3	<0.001*

*Statistically significant at $p < 0.05$.

Complications

Complication Type	Phaco-Trab Group (n=25)	SICS-Trab Group (n=25)
Hyphema	2	4
Shallow Anterior Chamber	1	3
Endophthalmitis	0	1
Choroidal Detachment	1	2
Total	4	10

Discussion:-

This study demonstrates the comparative efficacy of phaco-trabeculectomy and SICS trabeculectomy in managing cataracts with coexisting glaucoma. The phaco-trabeculectomy group showed superior outcomes in terms of IOP reduction, visual acuity improvement, and fewer complications.

Intraocular Pressure Control:
Phaco-trabeculectomy consistently achieved lower postoperative IOP levels, likely due to the precise control offered by phacoemulsification and the effective filtration provided by trabeculectomy. This finding aligns with previous studies highlighting the effectiveness of combined procedures in managing intraocular pressure in glaucoma patients.

Visual Acuity Improvement:
Patients in the phaco-trabeculectomy group experienced a more significant improvement in visual acuity, reflecting the minimal invasiveness and superior IOL technology associated with phacoemulsification. The use of foldable IOLs in phaco-trabeculectomy offers better optical quality and visual outcomes.

Surgical Time:
The shorter surgical time in the phaco-trabeculectomy group is noteworthy, reflecting the efficiency of modern phacoemulsification techniques. Reduced surgical time correlates with less intraoperative stress and faster patient recovery.

Complications:
The phaco-trabeculectomy group had fewer complications, suggesting a more favorable safety profile. The higher complication rates in the SICS-trabeculectomy group may be attributed to the manual nature of the procedure and the larger incision required, which increases the risk of postoperative issues.

Limitations:
This study's limitations include a relatively small sample size and a single-center design, which may limit the generalizability of the findings. Further multicenter studies with larger cohorts are needed to validate these results.

Conclusion:-

Phaco-trabeculectomy is superior to SICS trabeculectomy in managing cataract patients with coexisting glaucoma, offering better intraocular pressure control, visual acuity outcomes, and fewer complications. These findings support the adoption of phaco-trabeculectomy as a preferred surgical approach in this patient population.

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