

Investigation of preferred surgical and anesthesia techniques for cataract surgery**Amna Bibi^a, Rabia Javaid^a, Jawaria Barkat^a**^a Department of Anesthesia, The University of Faisalabad.Correspondence: jawariabarkat1@gmail.com**ABSTRACT**

Background and Objectives: The review of literature to assess the ideal anesthesia and surgical techniques for cataract surgery. The surgical techniques mostly ophthalmologists prefer phacoemulsification and Extracapsular cataract extraction technique meanwhile in anesthesia preference mostly topical with intracameral anesthesia and retrobulbar is in use. Furthermore, study delves into the role of ophthalmologist's factors such as their experience, choice of surgery and anesthesia, patient safety and preference, and the changing trends between ophthalmologists. The objective of this study was to improve patient care and outcomes, this study intends to evaluate anesthetic performances and cataract surgical procedure with an emphasis on efficacy, safety, patient comfort cost effectiveness, accessibility, scalability and long-term outcomes.

METHODOLOGY: TA cross-sectional survey of ophthalmology participants covered demographics, chosen surgical and anesthesia techniques for cataract surgery, factors influencing anesthesia choice, sedation use, anesthesia administration, supervision by trained personnel, and evolving anesthesia trends among surgeons.

RESULTS: According to our study most respondents were middle-aged or older, with 73.5% aged 35-55 and 26.5% over 55. The gender distribution was balanced, with Phacoemulsification (55.5%) being the most common surgical method. Most patients (84%) found the procedures very effective, preferring topical anesthesia (37%) for its convenience. Supplementary medications were widely used (85.5%), and follow-up protocols varied. The findings underscore the growing preference for Phacoemulsification and topical anesthesia, highlighting advancements in cataract surgery and patient care.

CONCLUSION: Currently, phacoemulsification is the ideal surgical technique for cataract. Topical with intracameral anesthesia is the common anesthesia for phacoemulsification while retrobulbar anesthesia is the most common for extracapsular cataract extraction.

KEYWORDS: Cataract, phacoemulsification, loss of vision, surgery and anesthesia

INTRODUCTION

Cataracts, caused by fluid buildup between lens fibers, lead to lens opacification, impaired vision, and symptoms like increased glare sensitivity and reduced color perception. Globally, cataracts and refractive errors are leading causes of vision impairment and blindness, affecting over 2.2 billion people. Only 17% of those with cataract-related vision impairment and 36% with refractive errors receive proper treatment. South Asia has the highest prevalence of visual impairment, with cataract rates in China rising significantly with age. The global cataract surgery coverage rate is 9.19%, with low complication rates due to surgical advance

ments. Western sub-Saharan Africa has the highest adult blindness prevalence, though significant reductions in cataract-related blindness have occurred in regions like Latin America and East Asia. Women experience cataracts at a faster rate than men, with Pakistan projecting an increase in cataract-related blindness among adults. The choice of anesthesia for cataract surgery is influenced by patient preference, medical history, and surgeon expertise. Techniques include topical, general, peribulbar, sub-Tenon, and retrobulbar anesthesia. While topical and low-volume sub-Tenon blocks are increasingly preferred due to

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their lower risk and reduced need for deep blocks, complications like needle misplacement and globe perforation can occur. Phacoemulsification has further reduced the necessity for deep anesthesia, though non-akinesia procedures may still pose surgical risks.

METHODOLOGY

Study Design: The study was cross-sectional study.

Study Population and Setting: All participants were chosen from:

- General Hospital, Lahore
- Mayo hospital, Lahore
- Sheikh Zaid Hospital, Lahore
- Jinnah Hospital
- Private Sectors

Study Duration: The study took 6 months after approval of synopsis

Selection Criteria : The participants will be selected as per the inclusion and exclusion criteria.

Inclusion Criteria:

- Male and female doctors aged (25 to onward).
- Improve visual outcomes and enhance clarity
- Long term stability of visual improvement
- Exclusion Criteria
- Only for anesthesiologist and ophthalmologists.

Sampling Technique

ECC is preferred by 48 (37.8%) of the sample's ophthalmologists. While Phacoemulsification is preferred by 78 (61.4%) of the ophthalmologists.

Outcome Measure: The primary concern is patient safety. Thus, the incidence of intraoperative and post-operative complications such as posterior capsule rupture, Endophthalmitis, or corneal edema would be a crucial primary outcome. Ophthalmologist evaluating reported results about patients' level of comfort. During surgery and their general level of satisfaction with the process and anesthetic technique.

Monitoring changes in intraocular pressure both during and right after surgery in order to assess how well anesthetic methods support stable intraocular pressure.

Statistical Analysis: Data analysis was conducted using IBM SPSS statistics version 27. Continuous variables are presented as mean (standard deviation), while categorical variables are Expressed as number (percentage). The responses to the questionnaire were kept anonymous until all participants had completed it in order to protect the privacy and confidentiality of the study and the participants. A spreadsheet was used to store The data. version 23 will be used for the analysis of data. The normality of data will be assessed by Shapiro-Wilks test and then parametric

tests (repeated measure ANOVA, independent t-test) or non-parametric tests (Friedman test, Mann-Whitney U test) will be applied.

Ethical Consideration : First of all study ethical approval will be gained from The University of Faisalabad, The applicants will be specified the details of the study orally and the consent forms Will be sign up from each participant. The participants will be enrolled depending on their own will, and the benefits and risks will be instructed to them. The members Will be given a declaration about the safety of data that it will be lock protected into the system.

RESULTS

It was indicated that (111 instances, or 55.5% of the total) were Phacoemulsification, a contemporary surgical method in which a tiny incision is used To break up and remove the hazy lens. 88 instances (44% of the total) involved the use of extra capsular cataract extraction, a conventional procedure in which the lens was removed in one price via a bigger incision.

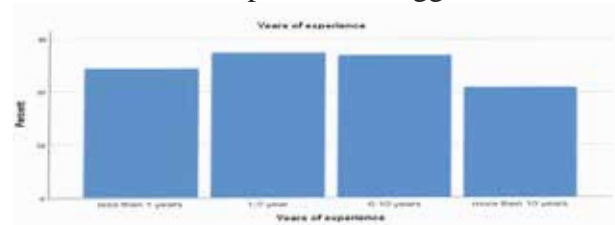


Figure 1. Type of cataract surgery and year of experience

Bar chart indicated that 84% of the 168 respondents, or a large majority, thought the surgical procedures were very effective. Significant percentage of respondents 12.5%, or 25 people rated the strategies as fairly effective, suggesting that there may be opportunity for improvement in the procedures' effectiveness. The remaining 7.5% of respondents regarded them .

Table 1: Percentage of surgical techniques in cataract Removal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly effective	168	84.0%	84.0	84.0
	Moderately	25	12.5%	12.5	96.5
	Satisfactory	7	3.5%	3.5	100.0
Total		200	100.0%	100.0	

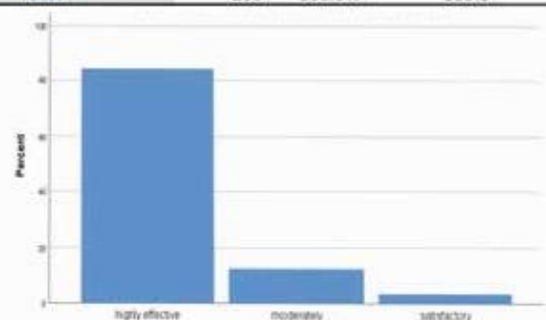


Figure 2. Rate effectiveness of surgical techniques in cataract Removal

DISCUSSION

This survey highlights recent practices in cataract surgery, focusing on anesthesia choices, surgical methods, and patient demographics. The majority of respondents were aged 35-55, with a balanced gender distribution. Phacoemulsification was the preferred surgical method (55.5%), with topical anesthesia favored by 37% due to its convenience and lower invasiveness. The study underscores the growing use of modern, less invasive techniques like phacoemulsification, often combined with intracameral anesthesia, to enhance patient comfort and surgical outcomes. Additionally, ongoing education and professional development were important to many respondents, reflecting the evolving field of cataract surgery.

The significance of prompt cataract surgery for enhancing visual function and quality of life in patients with substantial cataract-related visual impairment was examined in a study by Lundstrom et al. (2020). elements including glare, contrast sensitivity, visual acuity, and influence on day-to-day activities. The goal of this study was to carefully choose patients in order to produce the best possible visual results and patient satisfaction. Because phacoemulsification is a safe, effective, and quick recovery procedure, it is still the gold standard for removing cataracts. Modern technology includes minimally invasive procedures and femtosecond laser-assisted cataract surgery. The patient's preoperative refractive error, corneal astigmatism, desired visual outcomes, and lifestyle preferences all play a role in the intraocular lens selection process. Standard method of choice for breaking up the nucleus of the lens was ultrasonic phacoemulsification. (1)

A study conducted by investigation of using spreadsheet software by Hamid M et al. (2022) Findings revealed that most preferred anesthesia technique for cataract surgery was topical anesthesia with intracameral injection, favored by 47.9% of respondents. In contrast, retrobulbar and peribulbar blocks were the least preferred methods. Lidocaine 2% emerged as the most commonly preferred local anesthetic, chosen by 57.7% of participants. The study suggests a growing preference for topical anesthesia techniques, particularly in conjunction with intracameral injection, driven by factors such as patient comfort and procedural ease (3).

According to our data the majority of respondents were middle-aged to older adults, with 73.5% falling between 35 and 55 years old, and 26.5% over 55 years old. This demographic skew indicates a significant

representation of older individuals undergoing cataract surgery. The sample was almost evenly split between males (48%) and females (50.5%), with a small percentage (1.5%) identifying as "Other." This balanced gender distribution is notable in medical surveys where gender disparities often exist. Phacoemulsification was the predominant surgical method (55.5%), followed by extra capsular cataract extraction (44%). This reflects the trend towards modern, less invasive techniques in cataract surgery. A large majority (84%) rated the surgical procedures as very effective, highlighting a high level of patient satisfaction with the outcomes of cataract surgery: Topical anesthesia was the most preferred method (37%), indicating its popularity due to convenience and lower invasiveness compared to other methods like general anesthesia (29%). Most respondents (85.5%) reported using supplementary medications during surgery, emphasizing their role in managing patient comfort and safety.

Forty-five percent of respondents scheduled follow-up appointments, with preferences split between immediate and individualized protocols based on surgical type. A significant portion of respondents (51.5%) preferred attending conferences and seminars for professional development, highlighting the importance of ongoing education in the field. Both surgical methods and anesthetic protocols have undergone revolutionary changes in cataract surgery, greatly enhancing patient comfort and results across the globe. As a result of its less invasive technique, which permits smaller incisions and quicker recovery periods than more traditional treatments like extra capsular cataract extraction (ECCE), phacoemulsification has become the method of choice. By utilizing femtosecond laser technology, surgical precision is significantly improved, leading to improved visual results. is one safer and more patient-friendly approach that has emerged in anesthesia procedures. Topical anesthesia (TA) in combination with intracameral anesthesia are more common since it is less complicated and has a lower risk of problems than injection-based procedures. Typically, 2% lidocaine is used. Intracameral anesthesia enhances topical treatments by reducing pain and treating intraocular diseases and more common since it is less complicated and has a lower risk of problems than injection-based procedures. Typically, 2% lidocaine is used Intracameral anesthesia enhances topical treatments by reducing pain and treating intraocular disease.

CONCLUSION

Currently, phacoemulsification is the ideal surgical technique for cataract. Topical with intracameral anesthesia is the common anesthesia for phacoemulsification while retrobulbar anesthesia is the most common for extracapsular cataract extraction. Because of its least invasiveness, shorter recovery periods, and superior Visual results we find in our data phacoemulsification is usually the recommended surgical approach for cataract surgery. It provides less astigmatism and quicker healing when used with small incision procedures, such as clear corneal or micro incision cataract surgery. In terms of anesthesia, peribulbar or topical anesthetic combined with intracameral anesthesia is typically favored over retrobulbar anesthesia. This method ensures the best possible patient outcomes and satisfaction during cataract surgery while minimizing intraoperative and postoperative problems. To sum up, research on the best surgical and anesthetic methods for cataract surgery provides important information about how to maximize surgical efficiency and patient outcomes. It is clear from thorough investigation that crucial elements Influencing clinical decision-making include patient comfort, surgical accuracy, recuperation timelines, and complication rates. Healthcare practitioners can increase the quality of care given to cataract patients, which will eventually improve surgical outcomes and patient satisfaction, by deepening their strategies. In short, our study Provide a summary of the current procedures for routine cataract surgery, the Preferred procedure in our data is phacoemulsification under topical and intracameral anesthesia for mature cataracts, most participants chose phacoemulsification under retrobulbar anesthesia.

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Amna Bibi: Substantial contributions to the conception and design of the work.

Rabia Javaid: Design of the work and the acquisition. Drafting the work.

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