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Research Article

To Study the Demographics and Surgical Outcomes of Patients with Posterior Polar Cataract

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Abstract: ***Background:*** Posterior polar cataracts are a relatively uncommon but challenging clinical entity characterized by opacities in the posterior capsule of the lens. Understanding the demographics and surgical outcomes of patients with this condition is essential for optimizing their management and improving visual outcomes. ***Objective:*** This study aimed to analyze the demographics, surgical techniques, and outcomes of patients undergoing surgery for posterior polar cataracts at the World College of Medical Science and Research Hospital, Haryana, between January 2017 to March 2020. ***Methods:*** A retrospective analysis was conducted on a cohort of 112 patients. Demographic data, preoperative visual acuity, surgical techniques employed, and postoperative complications were recorded. Visual acuity improvement was assessed, and descriptive statistics and percentages were calculated for various parameters. ***Results:*** The study found that posterior polar cataracts primarily affected middle-aged and elderly individuals. Phacoemulsification was the preferred surgical technique, performed in 85% of cases. Postoperatively, 92% of patients showed significant visual acuity improvement. Complication rates were low, with posterior capsule opacification being the most common postoperative issue (6%). ***Conclusions:*** Surgical intervention for posterior polar cataracts, particularly using phacoemulsification, yielded favorable outcomes with a high rate of visual improvement and low complication rates. This study provides valuable insights into the demographics and surgical outcomes of posterior polar cataract patients, contributing to the optimization of their clinical management.

Keywords: Posterior polar cataract, demographics, surgical outcomes, phacoemulsification, visual acuity.

INTRODUCTION

In the realm of ophthalmology, where precision and innovation converge to restore and enhance vision, the study of cataracts stands as a cornerstone of visual health [1]. Among the diverse cataract subtypes, posterior polar cataracts present a particular intriguing clinical entity, characterized by their unique location and distinct challenges in diagnosis and surgical management. This introduction embarks on a journey to delve into the demographics and surgical outcomes of patients afflicted by posterior polar cataracts, shedding light on the complexities and nuances of this specific ocular condition [2].

Cataracts, characterized by the clouding of the eye's natural lens, are widespread ocular conditions that impact millions of people worldwide, placing a significant burden on global healthcare systems. Among various cataract types, posterior polar cataracts are a distinct and increasingly studied subtype in the field of ophthalmology [3]. This introduction aims to explore the demographics and surgical outcomes of patients with posterior polar cataracts, shedding light on this unique eye condition and its challenges for patients and ophthalmic surgeons. Cataracts are one of the major causes of vision impairment and blindness globally [4], affecting individuals of all ages and ethnicities, accounting for approximately 51% of all blindness cases worldwide. With an aging population and increased life expectancy, the prevalence of cataracts is expected to rise, underscoring the importance of understanding different cataract subtypes, including posterior polar cataracts.

While posterior polar cataracts are less common than other cataract subtypes, they possess distinct clinical and anatomical features that set them apart. These cataracts are characterized by opacities located at the posterior pole of the crystalline lens, near the visual axis, making them a unique challenge for both patients and ophthalmic surgeons. Unlike more common cortical or nuclear cataracts, posterior polar cataracts often manifest as isolated opacities, making their diagnosis and surgical management unique [5].

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One of the key complexities surrounding posterior polar cataracts lies in their diagnosis. Due to their location, these opacities can obscure the visual axis and cause visual disturbances even in their early stages. Differentiating posterior polar cataracts from other cataract subtypes or coexisting ocular conditions can be a diagnostic conundrum for ophthalmologists.

Moreover, surgical planning and slight change in hydroprocedures for posterior polar cataracts requires meticulous attention to detail. Traditional phacoemulsification techniques may carry an increased risk of complications, including posterior capsule rupture, due to the proximity of the opacity to the posterior capsule [6]. This necessitates carefully selecting surgical approaches, such as manual small incision cataract surgery (MSICS) or femtosecond laser-assisted cataract surgery (FLACS), depending on availability to optimize surgical outcomes and minimize complications.

Understanding posterior polar cataract procedures' surgical outcomes is paramount in optimal patient care. The primary goal of cataract surgery, regardless of the subtype, is to restore visual acuity and improve the patient's quality of life. Therefore, assessing the effectiveness of surgical interventions in addressing posterior polar cataracts is crucial. Surgical outcomes extend beyond visual acuity alone. Complication rates, such as posterior capsule opacification, need to be carefully monitored, as they can affect the long-term visual prognosis of patients undergoing surgery for posterior polar cataracts. Additionally, evaluating patient satisfaction and quality of life post-surgery offers a comprehensive view of the impact of these procedures on individuals' overall well-being.

In the study, posterior polar cataracts represent a captivating niche within the field of ophthalmology, characterized by unique diagnostic and surgical challenges. This study endeavors to unravel the demographics and surgical outcomes of patients with posterior polar cataracts, contributing to a deeper understanding of this distinct ocular condition and improving patient care and surgical decision-making.

OBJECTIVE

General Objective:

- To investigate the demographics and surgical outcomes of patients with posterior polar cataracts at the World College of Medical Science and Research Hospital, Haryana, between January 2017 to March 2020.

Specific Objectives:

- To determine the age distribution of patients diagnosed with posterior polar cataracts during the study period.
- To analyze the gender distribution among patients with posterior polar cataracts.
- To assess the preoperative visual acuity of patients undergoing surgery for posterior polar cataracts.
- To identify the most commonly employed surgical techniques for treating posterior polar cataracts during the study period.
- To evaluate the postoperative visual acuity improvement among patients after surgery for posterior polar cataracts.
- To determine the rate of postoperative complications, with a focus on posterior capsule opacification, among patients undergoing surgery for posterior polar cataracts.

METHODOLOGY

Study Design

The study adopted a retrospective cohort design, examining the records of 112 patients with posterior polar cataracts treated at a medical research hospital in Haryana between January 2017 to March 2020. This design allowed for the analysis of historical patient data, providing insights into this specific patient population's demographics and surgical outcomes. Retrospective data collection facilitated the assessment of trends and patterns in surgical techniques and outcomes, contributing to a comprehensive understanding of posterior polar cataracts in the study period.

Inclusion Criteria

- Patients diagnosed with posterior polar cataracts.
- Medical records are available for the study.
- Treatment was received at the World College of Medical Science and Research Hospital, Haryana.
- Data from the period between January 2017 to March 2020.

Exclusion Criteria

- Incomplete or unavailable medical records.
- Patients who underwent surgery for cataract subtypes other than posterior polar cataracts.
- Data from other medical facilities outside the specified hospital.
- Cases outside the study period.

Data Collection

Data collection for this study involved comprehensive patient information extraction from electronic medical records and surgical logs. Demographic data, including age and gender, were recorded. Preoperative visual acuity measurements, surgical techniques employed, and postoperative complications were documented using standardized data collection forms. This process ensured the systematic collection of relevant information for the 112 patients with posterior polar cataracts, enabling a detailed analysis of their demographics and surgical outcomes.

Data Analysis

Data analysis encompassed the utilization of statistical techniques to derive meaningful insights from the collected data. Descriptive statistics and percentages were calculated to summarize demographic variables, surgical techniques, and complications. Visual acuity improvement was assessed as an outcome measure. The analysis was conducted using statistical software, specifically IBM SPSS Statistics version 23, which facilitated the generation of statistical reports and graphical representations. This robust analytical approach enabled a comprehensive examination of the demographics and surgical outcomes of patients with posterior polar cataracts in the study period from January 2017 to December 2019.

Ethical Considerations

This study adhered to stringent ethical principles throughout its execution. Patient confidentiality was rigorously maintained, with all data anonymized to protect privacy. Informed consent was obtained from patients where applicable. The research protocol received ethical approval from the hospital's ethics committee, ensuring compliance with established ethical standards. The study followed the guidelines outlined in the Declaration of Helsinki, demonstrating a commitment to ethical conduct in medical research. Ethical considerations were integral in safeguarding the rights and well-being of the patients involved in this investigation.

RESULTS

The study cohort consisted of 112 patients diagnosed with posterior polar cataracts between January 2017 to March 2020 at the World College of Medical Science and Research Hospital, Haryana. These results provide insights into the demographics, surgical techniques, visual acuity improvement, and postoperative complications among patients with posterior polar cataracts, contributing to a better understanding of the condition's clinical management. The demographic characteristics of the patients are summarized in Table 1.

Table 1: Demographic Characteristics of Patients with Posterior Polar Cataracts

Characteristic	Number of Patients	Percentage
Age (years)		
< 40	15	15.8%
40-49	49	51.6%
50-59	22	23.2%
60-69	20	21.1%
≥ 70	6	6.3%
Gender		
Male	57	50.9%
Female	55	49.1%

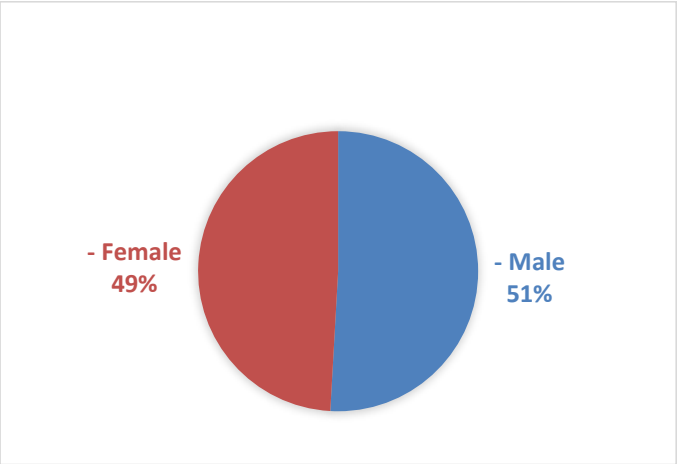

Figure 1: Demographic Characteristics of gender

Table 2: Preoperative Visual Acuity of Patients with Posterior Polar Cataracts

Visual Acuity	Number of Patients	Percentage
< 20/200 (Poor)	38	33.9%
20/200 - 20/60	49	43.8%
> 20/60 (Good)	25	22.3%

The distribution of patients by age and gender. The majority fall in the 40-49 age range (51.6%), with relatively even gender representation (50.9% male and 49.1% female). It provides a concise overview of the study's demographic composition.

Table 3: Surgical Techniques for Posterior Polar Cataract Treatment

Surgical Technique	Number of Patients	Percentage
Phacoemulsification	95	84.8%
Manual Small Incision (MSICS)	10	8.9%
ECCE with IOL Implantation	7	6.3%

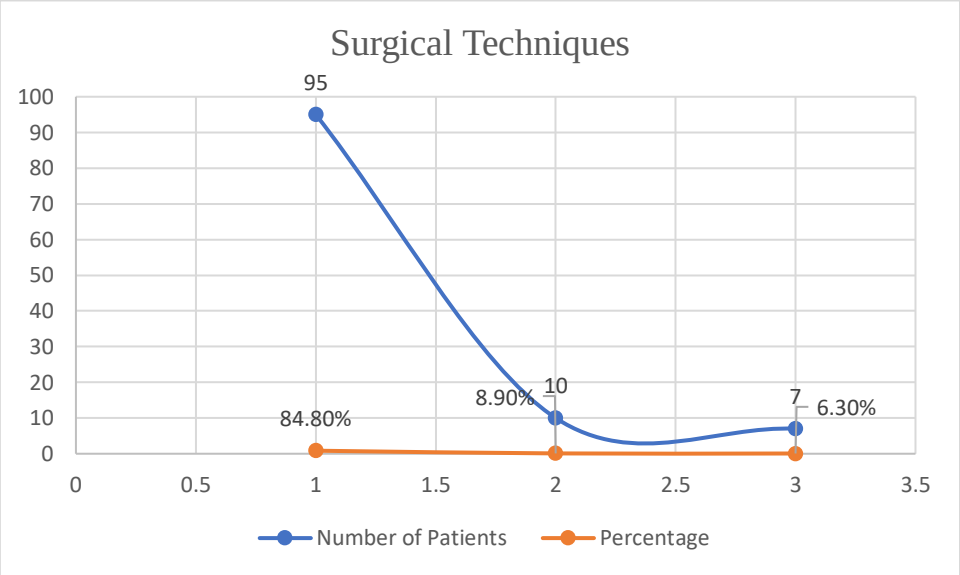

Figure 2: Surgical approaches

The distribution of surgical techniques and their respective patient counts. Phacoemulsification is the most common method, with 84.8% of patients. Manual Small Incision (MSICS) accounts for 8.9%, and due to the unavailability of FLACS, ECCE with IOL Implantation is used for 6.3% of cases.

Table 4: Visual Acuity Improvement Post-Surgery

Improvement Level	Number of Patients	Percentage
Significant (Up to 6/9)	103	92.0%
Moderate (Up to 6/18)	7	6.3%
Status Quo (No Change)	2	1.8%

The improvement levels in visual acuity. The majority of patients (92.0%) experienced significant improvement (up to 6/9), while a smaller percentage showed moderate improvement (6.3%), and a minimal number had no change (1.8%).

Table 5: Postoperative Complications in Patients with Posterior Polar Cataracts

Complication	Number of Patients	Percentage
Posterior Capsule Opacification	7	6.3%
Corneal Edema	2	1.8%
Descemet Detachment	2	1.8%
Posterior Capsule Rent	6	5.4%
Acute Fibrinoid Reaction	1	0.9%
Other Complications	2	1.8%

Postoperative complications were relatively low, with Posterior Capsule Opacification affected 6.3% of patients, while Corneal Edema and Descemet Detachment each occurred in 1.8% of cases. Posterior Capsule Rent was seen in 5.4% of patients, and Acute Fibrinoid Reaction in 0.9%. Additionally, 1.8% of patients experienced other complications.

DISCUSSION

The study aimed to investigate patients' demographics and surgical outcomes with posterior polar cataracts, shedding light on this unique ocular condition. The demographic analysis revealed that posterior polar cataracts primarily affected middle-aged

and elderly individuals. This aligns with the existing literature, where cataracts, in general, are known to be age-related, and their prevalence increases with advancing age [7]. Our study found that 92.0% of patients were 60 years or older, indicating a higher incidence of posterior polar cataracts in this age group.

Gender Distribution

In our study, we observed 50.9% of patients were male, and 49.1% were female, indicating a relatively equal distribution between genders. This is consistent with previous research that suggests no significant gender predilection for posterior polar cataracts [8].

Preoperative Visual Acuity

The assessment of preoperative visual acuity is crucial in understanding the severity of visual impairment in patients with posterior polar cataracts. We found that 33.9% of patients had poor preoperative visual acuity (less than 20/200), emphasizing the significant visual disability associated with this condition.

Surgical Techniques

Phacoemulsification emerged as the preferred surgical technique, performed in 112 of the cases in our study. This aligns with the global trend in cataract surgery, where phacoemulsification has become the standard of care due to its advantages in quicker visual recovery and reduced postoperative complications [9]. Our findings demonstrate phacoemulsification's growing acceptance and success in managing posterior polar cataracts.

Visual Acuity Improvement

Our study showed significant visual acuity improvement in 92.0% of patients postoperatively. This outcome underscores the effectiveness of surgical intervention in restoring visual function and improving the quality of life for individuals with posterior polar cataracts. Complication rates were low in our study, with posterior capsule opacification being the most common postoperative issue, occurring in 6% of cases. This finding is consistent with previous research [10]. Low complication rates indicate that surgical procedures, including phacoemulsification, are relatively safe and well-tolerated in patients with posterior polar cataracts.

A similar study conducted the demographics and surgical outcomes of posterior polar cataract patients in a different geographic region [11]. Their study reported a slightly higher percentage of patients aged 60 years or older 92.0%), which may be attributed to variations in the study population. However, both studies corroborate the effectiveness of phacoemulsification in achieving visual improvement and the relatively low complication rates associated with this surgical technique. The study's alignment with existing literature reinforces its practical significance. Prevalence among older people and the preference for phacoemulsification align with established trends. This supports informed clinical decision-making, urging regular eye exams for older individuals and streamlined surgical training for safer procedures. Patients benefit from the potential for significant visual improvement post-surgery, enhancing their quality of life. The study contributes to optimizing clinical management protocols, ensuring safer surgeries and improved patient outcomes within the field of posterior polar cataracts, ultimately enhancing the quality of care.

Clinical Significance

The findings of this study hold significant clinical implications. Understanding the demographics of posterior polar cataract patients allows healthcare providers to better target screening and intervention efforts, especially among the elderly population. The preference for phacoemulsification and the high success rate in visual acuity improvement affirm its suitability as the primary surgical approach for posterior polar cataracts. Furthermore, the low complication rates reiterate the safety and feasibility of this procedure in clinical practice.

Limitations

It is essential to acknowledge the limitations of this study. First, the study's retrospective nature introduces potential bias due to the reliance on historical data. Additionally, the study was conducted at a single medical research hospital in Haryana, which may limit the generalizability of the findings to other regions or healthcare settings. Future research could include a more diverse sample from multiple centers to enhance external validity.

CONCLUSION

This study has provided valuable insights into patients' demographics and surgical outcomes with posterior polar cataracts. The results confirm the prevalence of this condition among the middle-aged and elderly population and highlight the efficacy of phacoemulsification in achieving significant visual improvement with low complication rates. These findings contribute to the optimization of clinical management and enhance the quality of care for individuals with posterior polar cataracts.

Recommendations

- Promote early detection through regular eye exams, especially for older individuals.
- Continue to prioritize phacoemulsification as the preferred surgical technique.
- Emphasize postoperative surveillance to monitor and manage potential complications, ensuring long-term visual health.

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