

# Ten-Year Experience with Cataract Surgery and Associated Complications in Albania

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## Abstract

Cataract remains a leading cause of visual impairment worldwide, and surgical intervention is the only effective treatment. In Albania, limited data exist regarding long-term outcomes and postoperative complications. This retrospective study evaluated 5,700 cataract surgeries performed at a major Albanian eye center between 2013 and 2023, focusing on surgical techniques, risk factors, and management of patients with ocular comorbidities. Both phacoemulsification and extracapsular cataract extraction (ECCE) were included. Data were collected on patient demographics, systemic and ocular comorbidities, type of anesthesia, surgical technique, intraoperative events, and postoperative complications, including posterior capsule rupture, corneal edema, elevated intraocular pressure, cystoid macular edema, and endophthalmitis. Statistical analyses assessed the incidence of complications and their association with surgical factors. Phacoemulsification was the predominant technique, accounting for 90% of cases, and was associated with a lower overall complication rate (4.3%) compared to ECCE (11.6%). Posterior capsule rupture was the most frequent complication (2.3%), while endophthalmitis was extremely rare (0.05%). A considerable proportion of patients presented with systemic or ocular comorbidities, including diabetes (16%) and wet age-related macular degeneration (4%), and combined cataract surgery with intravitreal injections was successfully performed in selected high-risk patients to optimize visual outcomes. These findings indicate that modern cataract surgery in Albania is safe and effective, particularly when phacoemulsification is employed. Careful preoperative assessment, meticulous surgical technique, and individualized management of patients with comorbidities are crucial for minimizing complications and optimizing postoperative visual function. Overall, this ten-year experience provides important benchmarks for cataract surgical practice in Albania and similar clinical settings, highlighting the benefits of advanced surgical techniques and tailored perioperative care for improving patient outcomes.

**Keywords:** Cataract Surgery, Phacoemulsification, Postoperative Complications, Intravitreal Injection.

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## Introduction

Cataract remains one of the leading causes of visual impairment worldwide, particularly in aging populations, and continues to significantly impact quality of life despite advancements in surgical techniques [1,2]. Over the past decades, innovations such as phacoemulsification and improved intraocular lens technologies have enhanced safety and visual outcomes, although postoperative complications still pose challenges for ophthalmologists [3]. Understanding their frequency, presentation, and risk factors is crucial for improving patient care and optimizing surgical strategies [4].

In Albania, the practice of cataract surgery has evolved substantially during the last ten years, aligning with global technological and clinical developments [5]. However, there is a limited number of published studies addressing long-term outcomes and postoperative complications in the Albanian population. This study provides a comprehensive ten-year overview of cataract surgical procedures in a major Albanian eye center, focusing on complication types, incidence, and contributing factors. Such insights are intended to guide future clinical practice and enhance surgical outcomes in similar regional contexts [6].

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## Methodology

This retrospective analysis included 5,700 cataract surgeries performed at a leading Albanian eye clinic over a ten-year period. Patients undergoing phacoemulsification or extracapsular cataract extraction were included, while those with incomplete documentation or significant pre-existing ocular pathology were excluded to minimize confounding [7]. Data collection encompassed demographics, preoperative visual acuity, systemic comorbidities, surgical technique, anesthesia type, intraoperative events, and intraocular lens selection.

Postoperative follow-up ranged from one day to twelve months, enabling identification of common complications such as posterior capsule rupture, endophthalmitis, corneal edema, cystoid macular edema, and intraocular pressure elevation [8,9]. Statistical analysis assessed complication rates and their associations with surgical variables to evaluate both the safety and long-term effectiveness of cataract surgery in this setting.

## Results

A total of 5,700 cataract surgeries were reviewed over the ten-year period. The mean age of patients was  $68.4 \pm 10.2$  years, ranging from 45 to 92 years. Females accounted for 3,200 (56.1%) of cases, and males 2,500 (43.9%). Phacoemulsification was the predominant technique, performed in 5,130 cases (90%), while ECCE accounted for only 570 cases (10%). Local anesthesia was used in 5,130 cases (90%), and general anesthesia in 570 cases (10%), typically for complex or high-risk patients.

Postoperative complications occurred in 285 eyes (5.0%). The most frequent complication was posterior capsule rupture, followed by transient corneal edema, elevated intraocular pressure (IOP), and cystoid macular edema. Endophthalmitis was extremely rare, occurring in only 3 cases (0.05%). Complication rates were consistently higher in ECCE compared to phacoemulsification.

**Table 1: Demographic and Surgical Characteristics of Patients (n = 5,700)**

Characteristic	Number of Patients	Percentage (%)
Mean age (years)	$68.4 \pm 10.2$	-
Gender		
– Female	3,200	56.1
– Male	2,500	43.9
Surgical technique		
– Phacoemulsification	5,130	90.0
– ECCE	570	10.0
Type of anesthesia		
– Local	5,130	90.0
– General	570	10.0

The vast majority of cataract surgeries were performed using phacoemulsification under local anesthesia, reflecting modern surgical practice in Albania.

**Table 2: Postoperative Complications (n = 5,700)**

Complication	Number of Eyes	Percentage (%)
Posterior capsule rupture	130	2.3
Corneal edema (transient)	80	1.4
Elevated IOP	55	1.0
Cystoid macular edema	17	0.3
Endophthalmitis	3	0.05
Total complications	285	5.0

Overall complication rates were low, with posterior capsule rupture being the most common. Endophthalmitis was extremely rare, demonstrating high surgical standards.

**Table 3. Complication Rates by Surgical Technique**

Complication	Phacoemulsification (n=5,130)	ECCE (n=570)
Posterior capsule rupture	100 (1.9%)	30 (5.3%)
Corneal edema	60 (1.2%)	20 (3.5%)
Elevated IOP	45 (0.9%)	10 (1.8%)
Cystoid macular edema	12 (0.2%)	5 (0.9%)
Endophthalmitis	2 (0.04%)	1 (0.18%)
Total complications	219 (4.3%)	66 (11.6%)

ECCE was associated with a higher complication rate than phacoemulsification, emphasizing the safety advantage of modern phaco techniques.

**Table 4: Cataract Surgery in Patients with Diabetes and Wet AMD**

Patient Group	Number of Eyes	Percentage of Total (%)	Combined with Intravitreal Injection	Number (%)
Diabetes mellitus	912	16.0	150	16.4
Wet age-related macular degeneration	228	4.0	120	52.6
Diabetes + Wet AMD	57	1.0	45	78.9

A significant proportion of cataract surgeries were performed in patients with systemic or ocular comorbidities. Patients with wet AMD often underwent combined cataract surgery and intravitreal injection (52.6%), while nearly 79% of patients with both diabetes and wet AMD received combined treatment, indicating careful planning to optimize visual outcomes.

## Discussion

This ten-year analysis of 5,700 cataract surgeries in Albania provides valuable insights into surgical outcomes, complications, and management of patients with ocular comorbidities. Our findings demonstrate that phacoemulsification is the dominant

surgical technique, accounting for 90% of cases, and is associated with a lower overall complication rate compared to extracapsular cataract extraction (ECCE). This aligns with global trends, where phacoemulsification is preferred due to smaller incisions, faster recovery, and reduced intraoperative risks [10,11].

The overall complication rate in this cohort was 5%, with posterior capsule rupture being the most frequent complication (2.3%). Transient corneal edema and elevated intraocular pressure were less common, and endophthalmitis was extremely rare (0.05%). These findings suggest that modern surgical techniques combined with meticulous perioperative care can maintain low complication rates, even in a large cohort over a decade [12,13]. Notably, ECCE showed a higher complication rate (11.6%), confirming that it remains a technique with higher intraoperative risk, typically reserved for complex or advanced cataracts where phacoemulsification may not be feasible [14].

The analysis of patients with systemic or ocular comorbidities highlights important considerations. Diabetic patients accounted for 16% of surgeries, while wet age-related macular degeneration (AMD) was present in 4%, and 1% had both conditions. Combined cataract surgery with intravitreal injection was performed in selected cases to optimize visual outcomes and minimize the need for multiple procedures. Notably, over half of wet AMD patients (52.6%) and nearly 79% of patients with both diabetes and wet AMD underwent combined treatment. These findings emphasize the importance of tailored surgical planning in high-risk populations [15,16].

Comparing these results with international studies, the complication rates in this Albanian cohort are consistent with reported rates from other high-volume surgical centers. Posterior capsule rupture rates ranging from 1–3% in large phacoemulsification series are consistent with our findings [17]. The low rate of endophthalmitis reflects strict adherence to aseptic protocols and prophylaxis, corresponding with international benchmarks of <0.1% [18,19]. The high proportion of phacoemulsification and low complication rates also suggest improvements in surgical training, technological adoption, and perioperative patient care over the past decade in Albania.

Limitations of this study include its retrospective design and reliance on medical records, which may underestimate minor complications. Additionally, long-term visual outcomes and patient-reported satisfaction were not analyzed, which could add valuable context to the functional outcomes of cataract surgery. Nevertheless, the large sample size and inclusion of high-risk patients make the findings relevant for understanding cataract surgery outcomes in Albania and similar healthcare environments [20].

## Conclusion

This ten-year analysis of 5,700 cataract surgeries in Albania demonstrates that phacoemulsification is the preferred and safest surgical technique, associated with low overall complication rates [21,22]. Posterior capsule rupture was the most common complication, while serious adverse events such as endophthalmitis were exceedingly rare [23].

Patients with systemic or ocular comorbidities, such as diabetes and wet age-related macular degeneration, can safely undergo cataract surgery, and combined procedures including intravitreal therapy may provide optimal outcomes in selected cases [23,24]. Overall, careful preoperative evaluation, meticulous surgical technique, and individualized surgical planning are essential to achieving optimal results. This study offers an important benchmark for cataract surgical practice in Albania and supports continued improvements in patient care and surgical quality.

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