



## Original Article

# Difficult Cataract surgery in a Tertiary centre in North India: Complications and clinical outcome

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## Abstract

*The purpose of this study is to determine the percentage of difficult cataracts out of total cataracts admitted in a tertiary care center, to study the intra and postoperative complications in patients with difficult cataracts undergoing cataract surgery, and to determine their visual outcomes. This was a retrospective, non comparative, single institutional, observational study.*

*The patients with difficult cataracts (according to inclusion criteria) were screened and preoperatively evaluated. These patients underwent manual small incision cataract surgery and were followed up on the 1st, 7th, and 40th postoperative days and monitored for postoperative visual acuity (VA) and complications.*

*Of 3844 patients, 1114 (28.9%) patients presented with difficult cataracts. Hypermature and mature cataracts, hard cataracts, and pseudoexfoliation constituted as the major causes. Of these, 492 (44.1%) patients presented with no complications postoperatively. The most common postoperative complication was corneal edema (39.3%). A total of 21.7% had VA <6/60 on postoperative day 1, which reduced to 5.06% on day 40 (P < 0.001). The patients with V/A >6/18 increased from 44.4% on day 1 to 62.3% on day 40 (P < 0.001). Visual morbidity remains high among patients with difficult cataracts, especially in patients with pseudoexfoliation and corneal pathology.*

**Keywords:** *Corneal degeneration, difficult cataract, hypermature cataract, pseudoexfoliation, zonular dialysis.*

## Introduction

Cataract contributes nearly two-thirds of burden of blindness in India<sup>[1]</sup> Most cataracts get detected in early stage of development, and undergo cataract surgery with minimal complications and good visual outcome. However, some patients are detected at later stages. Such difficult cataracts

carry higher intraoperative risks and postoperative complications leading to poor visual prognosis. It is paramount to recognize the greater risk involved and act accordingly, to provide a better visual outcome to patients. This study was aimed at determining the percentage of difficult cataracts out of total cataracts and studying their

intra and postoperative complications along with an assessment of postoperative visual outcomes.

### Materials and Methods

This was a retrospective, single institutional, observational study. It was conducted after obtaining approval from the ethical committee at our institution. This study was conducted at a tertiary government hospital, located in Northern India which also serves as a major referral center in this region. In this study, we have included cataract patients with hypermature cataract, grade IV–V cataract/hard cataract, subluxated lens, pseudoexfoliation, zonular dialysis, nondilating pupil, nebulomacular and leucomatous corneal opacities, peripheral corneal degeneration. In case of combination of above criteria, patients were categorized according to the predominant diagnosis. Traumatic cataract, pediatric cataract, those associated with glaucoma, cataracts with high refractive error, corneal dystrophies were excluded from our study.

The study was conducted on patients who were admitted over a period of 2 years (January 2015–December 2017). Of these, patients with difficult cataracts (according to the inclusion criteria) were screened and preoperatively evaluated. Informed consents were taken, and all cases of difficult cataract underwent manual small incision cataract surgery (SICS) under local anesthesia. All patients were followed on 1st, 7th, and 40th postoperative days. These cases were monitored for postoperative VA and complications. The complications on postoperative day 1 were graded according to the Oxford Cataract Treatment and Evaluation Team (OCTET) definition. Grade I: Trivial complications that may have needed medical therapy but were not likely to contribute to drop in VA. Grade II: Intermediate complications that needed medical therapy and were likely to result in marked drop in VA if left untreated. Grade III: Serious complications that would have needed immediate medical and surgical intervention to prevent gross visual loss.<sup>[2]</sup>

### Results

The study was conducted on a total of 3844 cataract patients. Of these, 1114 patients had difficult cataracts. On basis of inclusion criteria the distribution of difficult cataract cases is given in Table 1. Intraoperative complications are described in Table 2. Postoperative complications occurring on days 1, 7, and 40 are presented in Table 3. Four hundred and ninety two (44.1%) patients presented with no complications on postoperative day 1. According to the OCTET grading, 43.9% of patients had Grade I complications, 10.5% had Grade II complications, and 1.83% had Grade III complications. Postoperative visual acuity on days 1, 7, and 40 are given in Table 4.

**Table 1:** Distribution of difficult cataract cases (N=1114)

Preoperative diagnosis	Number of eyes (%)
Hypermature Cataract	278 (25.1)
Grade IV-V	223 (19.5)
Pseudoexfoliation	368 (33.1)
Subluxated lens	12 (1.0)
Corneal Opacity and degeneration	68 (6.1)
Rigid Pupil	165 (14.8)

**Table 2:** Intraoperative complications that occurred while performing manual small incision cataract surgery on difficult cataracts

Intraoperative complication	Number of eyes (%)
Posterior capsule rent	38 (3.4)
Zonular dialysis	232 (20.8)
Iridodialysis	12 (1.07)
Descemet membrane Detachment	2 (0.17)
Nucleus drop	0
<b>Total</b>	<b>284 (25.4)</b>

**Table 3:** Postoperative complications occurring on days 1, 7, and 40

Postoperative complications	Number of eyes (%)		
	Day 1	Day 7	Day 40
Corneal edema	438(39.3)	35 (3.14)	8 (0.71)
Iritis	107 (9.6)	7 (0.6)	0
Hyphema	56 (5)	0	0
Hypopyon	12 (1.07)	1 (0.08)	0
Decentered IOL	8 (0.7)	0	0
Endophthalmitis	1(0.08)	1 (0.08)	2 (0.17)

IOL: Intraocular lens

**Table 4:** Distribution of patients according to postoperative visual acuity on days 1, 7, and 40

VA	Number of eyes (%)		
	Day 1	Day 7	Day 40
<6/60	242 (21.7)	206 (18.5)	56 (5.06)
6/60-6/18	378 (33.9)	222 (19.9)	364 (32.6)
6/18-6/6	494 (44.4)	686 (61.6)	694 (62.3)
P		$P < 0.001$	$< 0.001$

$P < 0.05$  significant. Wilcoxon signed-rank test used. VA: Visual acuity

## Discussion

A total of 28.9% ( $n = 1114$ ) of patients presented with difficult cataracts. In developing countries including India, hypermature and mature (25.1%) ( $n = 278$ ) and hard cataracts (19.5%) ( $n = 223$ ) constitute a significant volume of difficult cataracts. In these patients the lack of red reflex, high intralenticular pressure in intumescent cataracts, and leaking of lens matter from anterior capsule puncture sites leads to greater surgical complexity. These patients are at a high risk for zonular dialysis, posterior capsule rent, and corneal endothelial damage. In such patients, the main intraoperative complication was posterior capsule rupture. Similar findings were made by Venkatesh et al., in their study on efficacy of manual SICS in treatment of patients with brunescant and white cataracts.<sup>[3,4]</sup>

Pseudoexfoliation causes serious intraoperative complications due to pupil rigidity and zonular instability. In a study done by Jawad et al. on cataract surgery in pseudoexfoliation, it was established that an increased frequency of complications in these patients was due to zonular dialysis rather than capsular tears.<sup>[5]</sup> A total of 20.8% of the patients in our study had zonular dialysis which was diagnosed intraoperatively. Majority of the patients who presented with intraoperative zonular dialysis had pseudoexfoliation or hypermature cataracts preoperatively. Cataract surgery in patients with corneal opacity and corneal degeneration is challenging because of reduced intraoperative visibility to the surgeon. There is further endothelial loss due to cataract surgery. This ultimately results in further corneal

decompensation. A total of 6.1% ( $n = 68$ ) of the patients in our study had corneal degeneration preoperatively.

The most common postoperative complication on day 1 was corneal edema (39.3%), followed by iritis (9.6%) and hyphema (5%). Patients with corneal edema were started on hyperosmotic ointment and eyedrops, leading to reduction to 0.7% on day 40. Postoperatively hypopyon occurred in 12 patients (1.07%), while endophthalmitis was seen in only 1 (0.08%) patient. Patients with iritis and hypopyon were treated with topical and systemic corticosteroids and showed response to treatment in all cases. This can be attributed to toxic anterior segment syndrome. Most patients with decentered intraocular lens underwent redialing postoperatively immediately. After assessing the VA in all patients postoperatively and correlating them with their preoperative diagnosis, we discovered that patients with clear cornea, hypermature cataract, and some hard cataracts and few cases of pseudoexfoliation did not show any complication, thus having VA between 6/18 and 6/6 ( $P < 0.05$ ). Majority of the patients with corneal degeneration and/or corneal opacity showed vision  $< 6/60$ . Rest of the patients had VA between 6/60 and 6/18 depending on ocular comorbidity and surgical excellence. Limburg *et al.* made similar inferences in their study.<sup>[6]</sup>

## Conclusion

Visual morbidity among patients with difficult cataracts remains very high despite best possible intra- and postoperative management. This is seen predominantly in patients with pseudoexfoliation, corneal pathology and those who suffer posterior capsular rent intraoperatively. Patients with hypermature cataract and Grade III–IV cataracts have a better visual prognosis.

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