

# A Clinical Study of Complicated Cataract in Uveitis among the Patients Attending O.P.D. in a Tertiary Care Hospital in Assam

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**Abstract:** ***Objectives:-**To study the morphological types of various complicated cataracts following uveitis along with evaluation of visual outcome and ocular complications following cataract surgery among the patients attending O.P.D. of Assam Medical College & Hospital, Dibrugarh, Assam. **Materials & Methods:** A prospective hospital based study conducted on 35 patients of complicated cataract secondary to uveitis. Selected cases underwent complete ophthalmic examination, grading of cataract and followed by cataract surgery. After surgery post-operative visual acuity and additional findings were noted and compared accordingly. **Results:** Out of 35 cases, 16 cases were male (45.71%), 19 cases were female (54.29%). The peak incidence of uveitic cataract was in age group of 31 – 40 years, 13 cases (37.14%). The most common morphological type of complicated cataract was posterior sub capsular type (18 cases, 51.43%). There was significant improvement in visual acuity after cataract surgery and were statistically significant ( $P < 0.05$ ). Among all the various early complications, recurrence of uveitis was commonly seen in 11 cases (31.43%), whereas pigments over the IOL surface was seen as most common late postoperative complication in 11 cases (31.43%), followed by Posterior capsular opacification. **Conclusion:** A thorough history and meticulous preoperative work up of patients are of paramount importance not only to plan the surgery but also to avoid any complications later. Least tissue handling, particularly of the iris should be tried in every step of the surgery. Thus, with careful patient selection, appropriate pre-operative preparation, diligent surgery and close post-operative supervision, the visual outcome in these cases are satisfactory.*

**Keywords:** Complicated Cataract, Uveitis, Visual Acuity, Assam

## 1. Introduction

Uveitis is a complex intraocular inflammatory process that involves the uveal and retinal tissues. A wide variety of causes exists for uveitis, including autoimmune processes and infectious agents (McCannel<sup>1</sup>1996). Cataract developing in an eye with a history of chronic or recurrent uveitis has historically been called cataracta complicata and indeed, the uveitic cataract is complicated cataract. Cataract formation is an especially common complication resulting from uveitis. Cataract develops in patients with uveitis because of the uveitis itself and some because of the steroids which is the cornerstone of treating uveitis. Compared with the general population, cataract formation occurs at an earlier age in uveitis patients<sup>2</sup>. Duration and intensity of inflammation, and treatment with medications (e.g. corticosteroids) and previous vitrectomy, are critical determinants for cataract formation. Nevertheless, the typical form of complicated cataract seen in patients with uveitis is posterior sub capsular cataract formation but progression to a total cataract is the rule in more advanced stages. The posterior sub capsular opacities consist of granules and vacuoles that often appear to extend into the cortex anterior to the main opacity. The most anteriorly placed opacities do not represent an extension but were the first to be laid down, at which they were themselves sub capsular. The total depth of the opacity is related to the length of time it has been present. The granules may be preceded by a polychromatic luster, which is seen in specular reflex of the slit beam<sup>3</sup>. In rare cases, an anterior sub capsular opacity can be observed primarily. Cataract formation at the posterior pole of the lens can be explained by a missing epithelial barrier and by the thinnest part of the lens capsule. Cataract may appear in various

clinical forms. Posterior synechiae are often seen with focal areas of anterior capsule necrosis and underlying lens opacities. Fibrin membranes overlaying the lens are often accompanied by an opacification under the anterior capsule. Calcium deposits may be observed on the anterior capsule or within the lens substance<sup>4</sup>. Moreover, age related cataract also can develop in patients with anterior uveitis.

Until a decade ago, presence of uveitis, active or inactive had been regarded as a contraindication for cataract surgery, particularly with intraocular lens implantation because of unrewarding results. It is complicated both from the standpoint of technical aspects of the surgery itself (limited access secondary to posterior synechiae, pupillary membrane, pupillary sphincter sclerosis, iris delicacy and vascular abnormalities and pre-existing glaucoma), and also because of the high likelihood of an exuberant post-operative inflammatory response which can ruin the desired surgical outcome.

But, presently due to the increasing availability of more delicate microsurgical techniques, through the use of pupil expanders, visco elastic material, small incision phacoemulsification techniques etc. has dramatically reduced the misadventures that use to be so common in eyes with uveitis and has been shown to offer good visual rehabilitation.

Careful examination is necessary to ascertain how much the cataract is actually contributing to the visual dysfunction before considering for the surgery, because visual loss in uveitis may also occur from a variety of other ocular problems such as macular edema or vitritis. As many of the

Volume 8 Issue 4, April 2019

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patients having uveitis may have posterior segment diseases, cataract in those patients deny the ophthalmologist the opportunity to visualize the fundus<sup>5</sup>. Therefore, cataract surgery in such patients is not only necessary to improve the vision but also necessary to permit examination, diagnosis and management of posterior segment abnormalities. Standard work up for uveitis is essential for all cases to know the underlying etiology of the uveitis and the type of uveitis. Moreover, the type of uveitis is one of the determining factors of surgical outcome in those cases. Ultrasonography (B-Scan) is usually required in cases where posterior segment could not be visualized due to dense cataract to get idea about posterior segment status.

Different studies have shown that, the diverse types of uveitis are extremely differing in their typical post-operative complications and courses of visual loss. Extra capsular cataract extraction or phacoemulsification with posterior chamber intraocular lens implantation effectively improves vision and is well tolerated in many eyes with uveitis, even for long periods<sup>6</sup>. Many studies have been reported that, IOL implantation can be recommended in patients suffering from FHC with excellent surgical and visual outcome, it is generally contraindicated in children with JRA- associated iridocyclitis, but IOLs may be successful in selected adults with JRA whose inflammation has been adequately controlled preoperatively. Extra capsular cataract extraction and phacoemulsification may be more challenging in uveitic eyes than in non-inflamed eyes, and intraocular inflammation should be controlled before surgery is considered. It is imperative to eliminate anterior chamber cells and to have the eye quiet without flare up of inflammation for at least 3 months prior to cataract surgery<sup>7</sup>. In order to get a satisfactory surgical outcome preoperative medications are also important. It has been advice to start preoperative corticosteroid therapy approximately 1 week before surgery. Oral corticosteroids at the dose of 0.5-1.0 mg/kg per day and hourly topical corticosteroid should be administered preoperatively. These may be tapered after surgery, depending on the post-operative inflammation.

Cataract surgery in uveitic eye is usually more challenging task than in non uveitic eye. The challenging situations in surgery in uveitic eye include-

- Extensive posterior synechiae- which require synechiolysis.
- Small miotic pupil – which may require different procedures e.g. pupil stretching, use of iris retractors, sphincterectomies etc.
- Fibrotic anterior capsule – making capsulotomy / capsulorrhexis difficult.
- Weak zonules – making cataract extraction / phacoemulsification and IOL implantation challenging or impossible.<sup>5</sup>

Capsulorrhexis should be aimed wherever possible as it has the additional advantage of in-the-bag IOL implantation. The chance of postoperative inflammation is always more where in-the-bag IOL implantation is not done. And, if logistically possible phacoemulsification should be the preferred method for nucleus removal. Meticulous cortical clean up is also an important aspect of the surgery as residual cortex may trigger inflammation. The use of Heparin coated IOLs has

been advocated as they have been shown to have fewer IOL deposits than polymethylmethacrylate (PMMA) lenses for up to one year after surgery. But, the frequency of post-operative synechiae formation and cystoid macular edema appears similar with both types of lenses. Continued use of corticosteroid after surgery is mandatory and they should be followed more frequently than the patients without uveitis. Visual compromise following cataract surgery with intraocular lens implantation in patients with complicated cataract with uveitis is usually attributed to posterior segment pathologies, mostly cystoid macular edema. The post-operative course may also be complicated by recurrence or exacerbation of uveitis. The incidence of posterior capsular opacification is higher in uveitic eyes, leading to earlier use of Neodymium Yttrium Aluminium Garnet (Nd:YAG) laser capsulotomy<sup>5</sup>.

In spite of the advances in techniques and technologies for the cataract surgery, patients of complicated cataract following uveitis are still a challenge for the ophthalmologist concerned. So, good patient selection after proper evaluation and preparation ahead of surgery, well planned surgery, prompt and proper management of postoperative complications are the paramount importance for better visual outcome in such patients.

So, this prospective hospital based, clinical study was carried out to find out the morphological types of complicated cataract following uveitis and to find out their visual outcome following small incision cataract surgery or phacoemulsification with posterior chamber intraocular lens implantation in patients with complicated cataract following uveitis attending the Department of Ophthalmology, Assam Medical College & Hospitals, Dibrugarh. Also, Efforts have been made to find out the complications encountered following its management.

## 2. Aims and Objectives

- To study the morphological types of various complicated cataract in uveitis.
- To evaluate the visual outcome in patients undergoing cataract surgery for complicated cataract
- To assess ocular complications following surgery.

## 3. Materials and Methods

Cases of complicated cataract secondary to uveitis, attending the OPD during a period of 1 years were included in the study with the following prefixed criteria.

### Inclusion criteria

Patients aged more than 12 years and all cases of complicated cataract following uveitis, where uveitis is either inactive or under control (Anterior chamber cells <1+) with medication for at least 3 months before surgery.

### Exclusion criteria

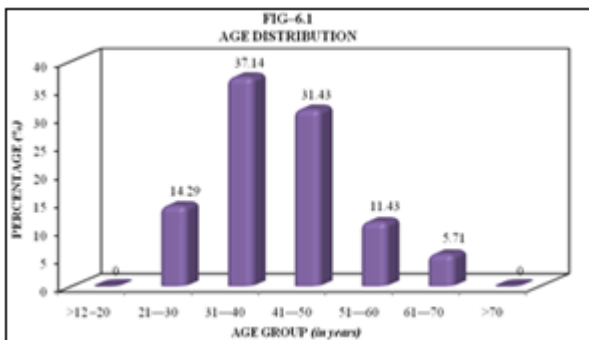
- Cases with acute, active uveitis
- Cases of recurrent uveitis with acute exacerbation
- Patients with perception of light negative.

Selected patients than underwent a detailed systemic and ocular examinations including recording of Best corrected visual acuity, slit lamp examination, Fundus examination along with recording of intraocular pressure, cases where media was hazy or had total cataract obscuring the view of fundus were underwent USG B Scan. Routine laboratory investigations were done in all cases and specific investigations were done if indicated. The final diagnosis was based on history, clinical findings and results of laboratory investigations. Morphological types and grading of the cataract was assessed by slit lamp examination.

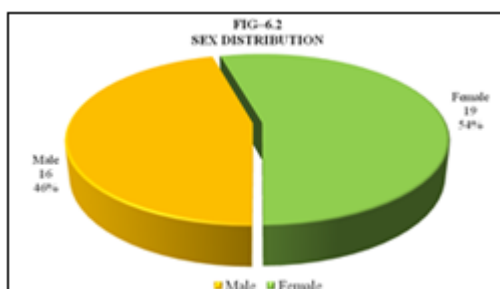
Patients were followed regularly to assess the control of uveitis and the progression of cataract. Those with visually significant cataract and quiet eyes for a period of at least 3 months underwent Small incision cataract surgery or Phacoemulsification with Intraocular Lens implantation. Additional steps were done whenever required, like in presence of small non dilating pupil, extensive synechiae and/or in presence of pupillary membrane. After that, patients underwent routine post-operative check-ups mainly to see anterior chamber reactions and grading them accordingly and for presence of any other complications. Pre-operative best corrected visual acuity and best corrected visual acuity at 1 month and at 3 months follow up was noted. And, also post-operative complications were noted at each visit.

**4. Results & Observation**

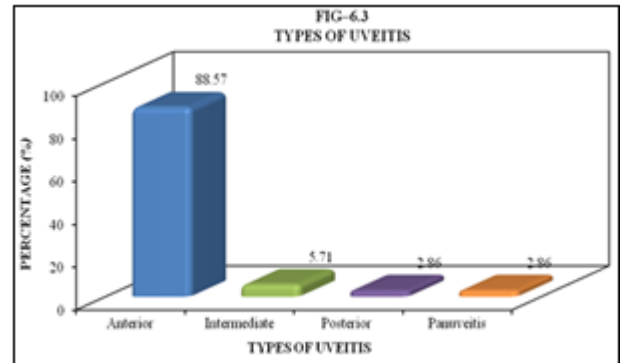
**Age Distribution:** Patients were ranged from 21 years to 68 years. The peak incidence of uveitic cataract was found in the age group of 31-40 years, which accounts for 13 cases (37.14%) and also progression of cataract was found to be more in younger age groups.



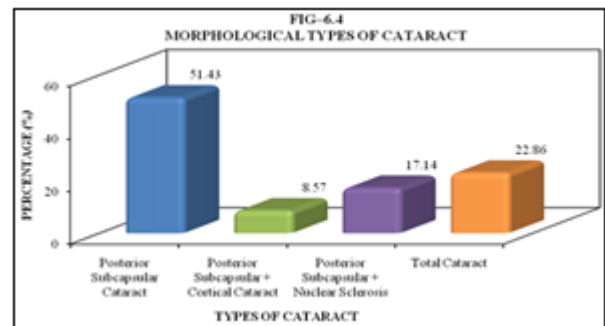
**Sex Distribution:** Out of 35 cases, 16 cases were male while 19 cases were female. Females outnumbered males with M:F ratio of 1.19:1



**Types of Uveitis:** In the present study, the type of uveitis most commonly associated with complicated cataract was anterior uveitis (88.57%) followed by intermediate uveitis (5.71%) and posterior and panuveitis (2.86%) each. And, majority of cases had chronic form of anterior uveitis.



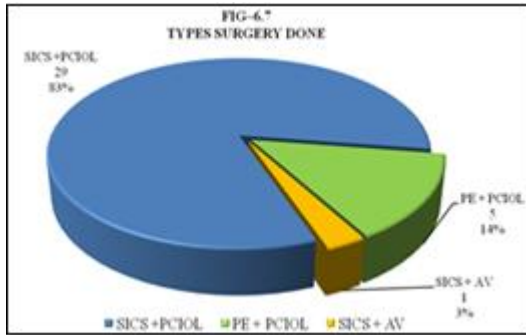
**Morphological type of cataract:** The most common morphological type of complicated cataract was posterior subcapsular type (51.43%), 22.86% were total cataract, 17.14% were of posterior subcapsular (PSC) with nuclear sclerosis and 14.29% had PSC with cortical cataract.



**Visual acuity at presentation: (Best Corrected Visual Acuity) :** In the present study 22.86% cases had BCVA at presentation in the range of 6/18-6/36, 57.14% had a BCVA 6/60-1/60 and 14.29% cases had a vision of as low as FC-HM and 5.71% cases had only PL.

Visual Acuity	Number (n)	Percentage (%)
6/12 or better	0	0
6/18 – 6/36	8	22.86
6/60 – 1/60	20	57.14
FC – HM	5	14.29
Only PL	2	5.71
TOTAL	35	100

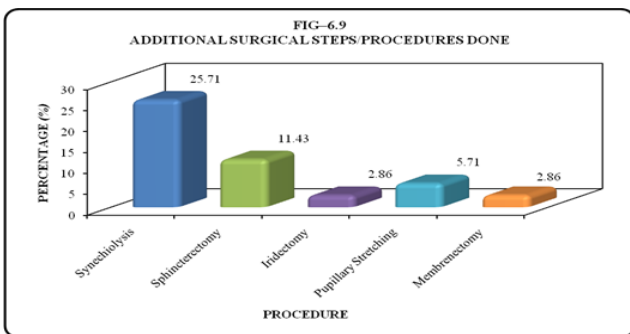
**Types of surgery done:** 82.86% cases underwent SICS+PCIOL surgery while 14.29% cases underwent PE+PCIOL and in 2.86% case SICS along with Anterior Vitrectomy done due to a large Posterior capsule rent.



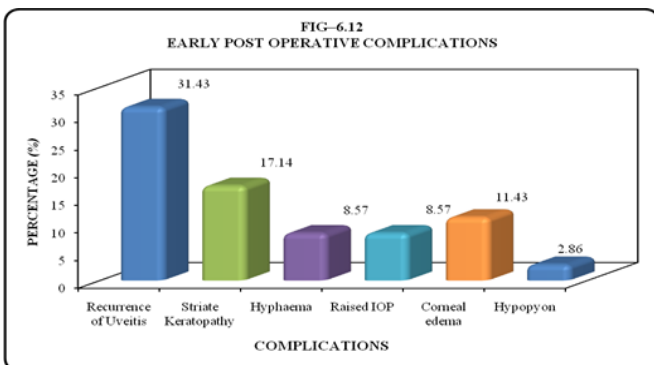
**Types of IOL used:** In 82.86% cases single piece PMMA lens was used while in 11.43% cases Acrylic lens was used. 1 case left aphakic due to large capsule rent.

Types of IOL Used	Number (n =35)	Percentage (%)
Single Piece PMMA Lens	29	82.86
Acrylic Lens	5	14.29
Lens Not Used	1	2.86

**Additional surgical steps/ intraoperative procedures done:** Synechiolysis was done most commonly in 25.71% cases followed by sphincterectomy, pupillary stretching, iridectomy and membranectomy.

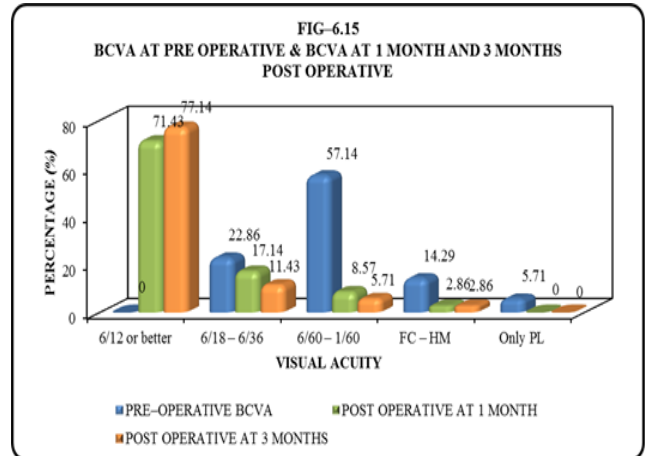


**Early post-operative complications:** Among the various early post-operative complications, most commonly seen was recurrence of uveitis seen in 31.43% cases, striate keratopathy in 17.14% cases, 8.57% cases had hyphaema, 8.57% cases had raised IOP, 11.43% cases had corneal edema and 2.86% case developed hypopyon.

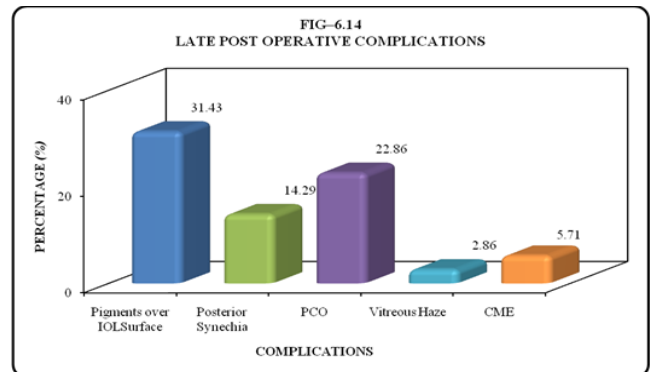


**Surgical outcome:** Pre operative and Post operative BCVA results shows statistical significance and there was significant improvement in visual acuity after cataract surgery. All cases received topical corticosteroids in tapered doses over 6 weeks postoperatively.

Visual Acuity	Pre-Operative BCVA		Post Operative At 1 Month		Post Operative At 3 Month		P value
	n =35	%	n =35	%	n =35	%	
6/12 or better	0	0	25	71.43	27	77.14	<0.05
6/18 – 6/36	8	22.86	6	17.14	4	11.43	
6/60 – 1/60	20	57.14	3	8.57	2	5.71	
FC – HM	5	14.29	1	2.86	1	2.86	
Only PL	2	5.71	0	0	0	0	



**Late post operative complications:** In the present study, most commonly seen late complication following surgery was pigments over IOL surface seen in 31.43% cases followed by PCO in 22.86% cases, posterior synechia was seen in 14.29% cases, CME in 5.71% cases and vitreous haze in 1 case. And, complications were treated accordingly.



## 5. Discussion

Thirty five eyes of 35 cases having complicated cataract following uveitis were taken up for the study of types of complicated cataract and to evaluate their visual outcomes following cataract surgery and also the complications encountered. All cases had visually significant cataract of different types and grades. The peak incidence of uveitic cataract was between 31-40 years, which was similar to the results found in study conducted by A Hazari *et al*<sup>7</sup> with mean age of 42.74±15 years. Rapid progression of cataract seen in younger age groups and were most commonly associated with chronic form of anterior uveitis. The most common morphological type of cataract seen was posterior subcapsular type. Many other studies and literatures also confirmed posterior subcapsular being the most common type. In our study, SICS with PCIOL was done in most cases

followed by phacoemulsification with intraocular lens implantation except in 1 case, in which large capsule rent occurred while removing cortex and PCIOL couldn't implanted and patient was left aphakic. Single piece PMMA or Acrylic lens was used in the present study. In most of the studies done on this subject, surgery done mostly was extracapsular cataract extraction with posterior chamber intraocular lens implantation. Many workers like Many workers like **Estafanous MF et al<sup>6</sup>**, **Ekhar JV et al<sup>8</sup>** did the study on phacoemulsification surgery in such cases. While, **Desai Set al<sup>9</sup>** did both Phacoemulsification and small incision cataract surgery but it was statistically not significant in terms of postoperative visual acuity. But they reported, the decreased incidence of post-operative complications in patients with PE + IOL and concluded it as safe and effective method in majority of patients with uveitis.

Cataract surgery with IOL implantation improved vision in most patients with coexisting cataract and uveitis<sup>4</sup>. In our study, post operatively at 1 month the corrected distant visual acuity improved to 6/12 or better in 25 eyes (71.43%), 6/18 to 6/36 in 6 eyes (17.14%). There was significant improvement ( $P < 0.05$ ) in visual acuity after cataract surgery at 1 month follow up. Visual acuity did not improve in 3 eyes (8.57%) despite successful surgical treatment because of presence of preexisting posterior segment pathology. 1 case lost at follow up at 3 months post operatively.

It show that 32 eye (91.43%) had visual improvement over the preoperative best corrected visual acuity and there is substantial improvement of visual acuity. Our results are satisfactorily compared to other studies related to this subject. In the study done in 1992 by **Daus et al<sup>10</sup>** there was visual improvement of 57 of the 63 eyes (90.5%) operated for cataract with uveitis. In another study done by **Krishna R et al<sup>11</sup>** (1998) 94% of the total 36 eyes who underwent surgery with PCIOL implantation had visual acuity improvement compared with the preoperative levels. **Okhravi N et al<sup>2</sup>** in 1999 also found visual acuity improvement (median + 4 Snellen lines) in 81 of eyes (90%) of 76 patients on whom cataract surgery was done. Later, In 2002 **A Hazari et al<sup>7</sup>**, **Kawauchi et al<sup>12</sup>** in 2007 and **Patricia et al<sup>13</sup>** in 2012 (83.3%), **Ekhar JV et al<sup>8</sup>** in 2015 reported similar results as far as the post operative improvement of visual acuity goes.

The most common complications encountered by different workers in different studies done on cataract in uveitis, though operated by different techniques remain as – recurrence of uveitis, posterior capsular opacification and cystoid macular edema.

The causes of the poor visual outcome were mostly related to macular degeneration with scar or secondary optic atrophy. In this present study also despite a successful surgery the above mentioned complications were responsible for poor visual outcome in 8.57% of the cases. PCO is encountered in 8 eyes (22.86%); however it was treated with Nd: YAG laser capsulotomy without leaving behind any permanent diminished effect on visual acuity.

## 6. Conclusion

Thorough history and meticulous preoperative work up of patients are of paramount importance not only to plan the surgery but also to avoid any complications later. Least tissue handling, particularly of the iris should be tried in every step of the surgery. Thus, with careful patient selection, appropriate pre-operative preparation, diligent surgery and close post-operative supervision, the visual outcome in these cases are satisfactory.

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