

Cystoid Macular Edema after Extracapsular Cataract Extraction Performed by Residents

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ABSTRACT

Purpose: To determine the frequency and outcome of management of cystoid macular edema after extra capsular cataract extraction performed by residents.

Study Design: Interventional case series.

Place and Duration of Study: Lady Reading Hospital, MTI, Peshawar from Oct 2018 to Oct 2019.

Material and Methods: Total 400 patients with mature cataract were included in our study. Patients having pre-existing disease such as uveitis, hypertensive retinopathy, diabetic retinopathy and retinal degenerations were excluded. All surgeries were performed by 4th year residents under supervision. Complicated cases before or during surgery were excluded from the study. Cystoid macular edema cases were classified as follows; acute occurring within three months of cataract extraction and with duration fewer than 6 months, chronic persisting more than 6 months. Patients were either managed conservatively or with anti-VEGF. All cases were followed for 3 months or longer until resolution of cystoid macular edema.

Results: Twenty patients developed cystoid macular edema out of which 16 patients (80%) improved with conservative treatment and 4 patients (20%) developed resistant cystoid macular edema. All four patients were given intravitreal bevacizumab injection monthly for three months. Our findings showed that best corrected visual acuity (BCVA) before injection ranged from 6/60 to 6/24. After three injections BCVA improved between 6/18 to 6/6. Pre injection central subfield thickness (CSFT) was between 611 to 480 micron which improved to 272 -260 micron after injections.

Conclusion: Cystoid macular edema responds well to conservative treatment but resistant cases need repeated inj of anti VEGF.

Key Words: Extra capsular Cataract Extraction, Cystoid Macular Edema, Cataract, Anti-VEGF.

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INTRODUCTION

Pseudo-phakic cystoid macular edema (CME) or Irvine-Gass syndrome, is a common cause of visual

loss after cataract surgery^{1,2}. This is a painless condition characterized by the formation of multiple fluid filled cystic areas in the outer plexiform and inner nuclear layer of the macula resulting in increased thickness. This causes blurring or distortion of vision³. It typically develops 4-12 weeks after surgery with peak incidence at four to six weeks following surgery⁴.

Vision loss in majority of cases of CME is transient. In majority of cases, it shows good response with the use of topical medications like corticosteroids and non-steroidal anti-inflammatory drugs. However,

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few cases were reported to last for more than 6 months resulting in permanent visual loss. Although the incidence of chronic CME is much less, being reported at 1 – 2% of uncomplicated cases, the associated vision loss makes it a serious complication. CME still persists in uncomplicated cases even with the advances in surgical machinery and newer techniques being employed in different methods of cataract extraction¹.

CME is suspected in otherwise healthy patients with poor visual outcomes after cataract extraction diagnosed clinically by fundoscopy, fluorescein angiography by OCT findings of central subfield macular thickening. Some studies have shown that angiographic edema occurs in 60% of intracapsular surgeries, varying between 15 – 30% in extracapsular surgeries, and 4 – 11% in phacoemulsification^{5,6}. Clinical CME, on the other hand, is reported in 8% of intracapsular surgeries, 0.8 – 20%⁷ in ECCE surgeries and 0.1 to 2.35% in phacoemulsification⁸. OCT evidence of CME after phacoemulsification is 4% shown by Belair⁵.

We employed OCT Scan as a diagnostic tool in analyzing CME in our patients. Macular thickness (extrafoveal and foveal) was recorded in cross sectional high resolution OCT images. The progression and regression of the edema was recorded. The purpose of our study was to determine the frequency and outcome of management of cystoid macular edema after extra capsular cataract extraction performed by residents

MATERIAL AND METHODS

This interventional case series included patients with CME after extra capsular Cataract Extraction (ECCE) with posterior chamber intraocular lens implantation, performed by the residents under supervision. A total of 400 cases were included in the study. Ethical approval from taken from the hospital and written consent was taken from all patients. Non probability consecutive sampling technique was used. Patients with mature cataract of either gender, having age 40 – 80 years, who underwent ECCE cataract surgery, without any complication i.e. posterior capsular rent with or without vitreous loss and post-operative endophthalmitis were included in the study. Patients having pre-existing disease i.e. uveitis, hypertensive retinopathy, diabetic retinopathy and retinal degenerations (assessed on slit lamp examination) were excluded. Data was collected through proforma

after fulfilling the inclusion criteria. All patients were operated by a senior resident. CME was diagnosed both clinically and on optical coherence tomography. All eyes were dilated before OCT examination and were monitored regularly using OCT. CME cases were classified as follows; acute which developed within three months of cataract extraction and lasted for less than 6 months. Chronic lasted for more than 6 months. All this information was recorded through pre designed proforma. Patients were followed up for improvement in visual acuity. Those patients with vision less than 6/9 with best correction were examined in detail for suspected macular pathology and were advised optical coherence tomography to properly diagnosis and manage such patients on time. Quantitative variables like age, and centre subfield thickness were presented in the form of mean \pm S.D. Qualitative variables like gender, and cystoids macular edema were presented in the form of frequencies and percentages.

RESULTS

Out of 400 patients, 150 (38%) were male while 250 (62%) were females. The patients were followed up

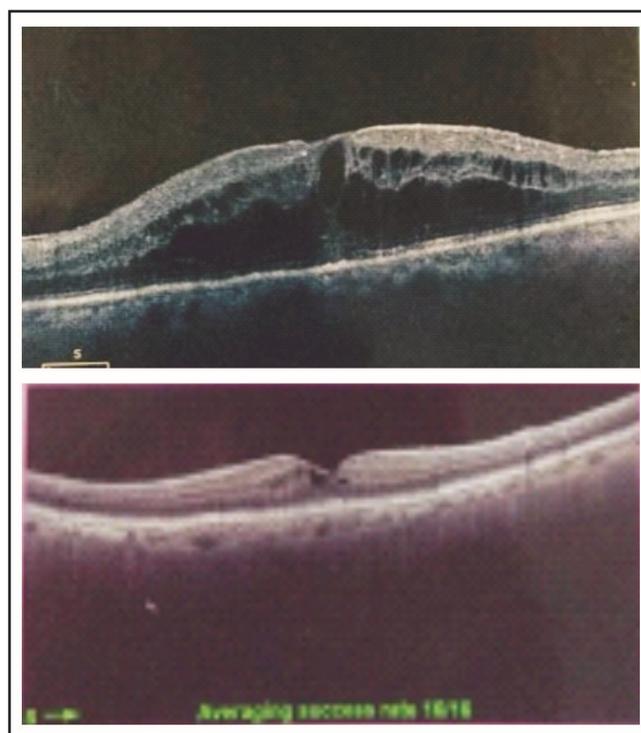


Fig. 1: Pre-injection and Post-injection central subfield thickness on OCT.

Table 1: Demographic features and final visual outcome of refractory (resistant) CME after treatment.

S/N	Age	Gender	BCVA on 1 st Post-op Visit	BCVA after 3 Injections of Bevacizumab
1	70	Female	6/24	6/6
2	68	Female	6/60	6/18
3	66	Male	6/36	6/12
4	81	Female	6/60	6/9

Table 2: Pre and Post injection (Bevacizumab) central subfield thickness.

S/N	Age	Gender	Pre Injection CSFT	Post Injection CSFT
1	70	Female	611 micron	272 micron
2	68	Female	550 micron	260 micron
3	66	Male	520 micron	250 micron
4	81	Female	480 micron	269 micron

for 3 months, 20 (5%) patients developed cystoid macular edema diagnosed on OCT. Patients were managed conservatively with topical non-steroidal anti-inflammatory drugs (NSAIDs) and topical steroids. These patients were further followed up for 6 months. Sixteen patients (80%) improved with conservative treatment while 04 (20%) were found resistant (refractory), who were given intravitreal Bevacizumab monthly for three months. After 3 months, all 4 patients (100%) reported improvement in BCVA of two or more lines on Snellen visual acuity chart ranging between 6/18 to 6/6. Central macular thickness improved from 611 micron to 250 micron on OCT (Figure 1). Visual acuity and OCT remained stable at 24 weeks of follow-up as shown in table 1 and 2.

DISCUSSION

Multiple factors are involved in the pathogenesis of pseudophakic CME. However, inflammatory process appears to be the main factor of edema. Prostaglandin mediated inflammation and subsequent breakdown of blood aqueous and blood retinal barrier increases vascular permeability⁹ with accumulation of fluid in retinal layers creating cystic spaces that subsequently coalesce to form larger pockets of fluid¹⁰.

The incidence of CME increases when complications occur during surgery¹¹. The most common complications are posterior capsular rent with loss of vitreous, incarceration of vitreous in the wound, lens drop in the vitreous, iris damage, intraocular lens dislocation, and implantation of

anterior chamber lens. Known history of retinal diseases such as uveitis, retinal vein occlusion, diabetes mellitus. Latanoprost usage for glaucoma treatment also increase the risk of macular edema after cataract surgery. Patient factors like age and sex, are also factors which affect development of CME¹². According to Stern et al younger people are more prone to CME after cataract surgery¹³. On the other hand, Rosetti et al said that older people are more prone to CME after cataract surgery¹⁴. In our study 15 (75%) out of 20 CME cases were 50 or above. Thus, in our study old age group developed CME more frequently than young age group. In our study, in 20 CME cases, 12 (60%) were females and 8 (40%) were males. These results were slightly different from the previous literature which stated that there was no sexual predilection for CME^{3,4}.

Treatment is aimed at the underlying etiology. Steroids directly inhibit the enzyme phospholipase thereby reducing the formation of prostaglandins and leukotrienes. They are considered primary treatment in many instances. Steroid are administered topically, systemically, intravitreally¹⁵. They can also be given in posterior subtenon space. However, they are associated with increased intraocular pressure. NSAIDs inhibit the enzyme cyclooxygenase and can be used in prevention and treatment of CMO. They are advised for 3-4 months; they do not increase the intraocular pressure. Carbonic anhydrase inhibitors and pars plana vitrectomy are also treatment options.

Anti-vascular endothelial growth factor (VEGF) therapy has revolutionized many retinal treatments. VEGF not only promotes angiogenesis, but it also promotes inflammation and capillary permeability that causes CME. Bevacizumab is a humanized monoclonal antibody that inhibits VEGF-A. Bevacizumab can be used as primary as well as refractory treatment for CME¹⁶. In our study we injected all the four refractory CME cases with intravitreal bevacizumab. All the patients showed significant improvement in BCVA of two or more lines on Snellen visual acuity chart as well as significant reduction in central sub field thickness on OCT. Multiple studies have reported cases of refractory CME treated with intravitreal bevacizumab with significant improvement in visual acuity as well as macular thickening¹⁷⁻¹⁹.

Arevalo et al¹⁶ reported a series of 39 eyes with pseudophakic macular edema unresponsive to conservative treatment. He showed that in 26 eyes

(72%) BCVA improved by at least two lines and mean baseline BCVA and central macular thickening improved from 6/60 and 500 micrometer to 6/24 and 286 microns respectively after a mean of 2.7 injections per eye. Barone et al¹⁷ reported 10 eyes with refractory CME and showed significant improvement in VA and macular thickness.

CME remains a common and difficult problem for patients and surgeons. Similar to previous studies, OCT has proved to be an excellent tool for diagnosis, management and follow up of CME after cataract extraction^{20,21}.

Limitation of our study was that it only included residents. Frequency of CME in expert hands could not be studied.

CONCLUSION

Even uneventful cataract surgeries can end up in macular edema, which needs proper follow up and management in the form of topical NSAID or Intravitreal Bevacizumab as a primary treatment or in refractory cases.

Ethical Approval

The study was approved by the Institutional review board/Ethical review board.

Conflict of Interest

Authors declared no conflict of interest.

Authors' Designation and Contribution

Adnan Alam; Specialist Registrar: *Study design, data interpretation, manuscript writing, final review.*

Mohammad Idris; Assistant Professor: *Manuscript writing, final review.*

Hassan Yaqoob; Associate Professor: *Manuscript writing, final review.*

Eemaz Nathaniel; *Manuscript writing, final review.*

Hadia Sabir; Post graduate trainee: *Manuscript writing, final review.*

Syed Ittrat Hussain; Posgraduate trainee: *Manuscript writing, final review.*

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