

# Resolution of Pseudophakic Cystoid Macular Edema with Combination Therapy of Topical Corticosteroids and Nonsteroidal Anti-inflammatory Drugs

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## ABSTRACT

A 69 years old women underwent uneventful cataract surgery of her left eye with phacoemulsification and posterior chamber intraocular lens implantation in topical anesthesia. Patient was postoperatively treated with combination of antibiotic and steroid in decreasing dosages during five weeks: one drop five times a day the first week, three times a day second to fourth week and one time a day the fifth week. In each checkup, performed first postoperative day, 7 days, 5 weeks and 12 weeks after the operation, visual acuity with and without correction, tonometry, corneal transparency, biomicroscopy of posterior pole and measure of macular thickness by optical coherence tomography (OCT) were performed. At first day follow-up visit, the patient's visual acuity was 20/25 but 6 weeks after the operation, the patient's vision had worsened to 20/60 after a slow steroid taper. At that time OCT showed foveal thickening and cystic changes specific for cystoid macular edema (CME). Combination of corticosteroid and non-steroidal anti-inflammatory drug four times daily was included in therapy. The dose was tapered off over the ensuing 8 weeks. The total treatment duration was 12 weeks. At the patient's 2-month follow-up visit, vision has improved to 20/20 and the fovea appeared flat. OCT showed complete resolution of foveal thickening and cystic changes. Combination of corticosteroid and NSAID is effective and safe therapy for treating pseudophakic CME. Patient showed significant improvement in visual acuity and retinal thickness at 2 months post treatment.

Abbreviations: OCT – optical coherence tomography, CME – cystoid macular edema, NSAID – non-steroidal anti-inflammatory drugs

**Key words:** cystoid macular edema, corticosteroids, antibiotics, non-steroidal anti-inflammatory drug, optical coherence tomography

## Introduction

Cystoid macular edema (CME) is the accumulation of extracellular fluid in the outer plexiform and inner nuclear layer of the macula that occurs as the result of the breakdown of the blood-retinal barrier<sup>1</sup>. It is characterized by cystoid fluid-filled spaces and it is easily detected with high sensitivity by fluorescein angiography and optical coherence tomography (OCT)<sup>2</sup>. Fluorescein angiography shows perifoveal petaloid pattern of leakage and late leakage of the optic disc. OCT shows cystic spaces in the outer nuclear layer<sup>3</sup>. CME has been classified either as angiographic or as clinically significant<sup>4</sup>. Clinically significant CME is defined as a Snellen visual acuity of 20/40 or worse. Common symptoms include decreased vi-

sual acuity and contrast sensitivity as well as metamorphopsia. CME is the most common cause of poor visual outcome following cataract surgery<sup>5</sup>. The incidence of CME following phacoemulsification in uncomplicated, low-risk patients can vary from 2–12%. The peak incidence is four to six weeks following cataract surgery<sup>6,7</sup>. Over time, there has been a decrease in the incidence of the CME which is attributed to improvement in surgical technique, reduced operative time and better intraocular lens devices<sup>8</sup>. Advances in technique, instrumentation, and pharmacology have increased expectations for surgical outcomes, from both the patient's and the surgeon's perspective<sup>9,10</sup>. First-line treatment of postsurgical CME

should include topical nonsteroidal anti-inflammatory drugs (NSAID) and corticosteroids. Oral carbonic anhydrase inhibitors can be considered complementary. In cases of resistant CME, periocular and intraocular corticosteroids present an option. Antiangiogenic agents should be considered for nonresponsive persistent CME. Surgical options should be reserved for special indications<sup>11</sup>.

### Case Report

A 69 years old women underwent uneventful cataract surgery of her left eye with phacoemulsification and posterior chamber intraocular lens implantation in topical anesthesia. Patient had no systemic vascular diseases, such as diabetes mellitus or hypertension and had no pre-existing macular disease before cataract surgery. Postoperatively, patient was treated with combination of antibiotic and steroid (tobramicine + dexametasone, Tobradex, Alcon®, USA) in decreasing dosages during five weeks: one drop five times a day the first week, three times a day second to forth week and one time a day the fifth week. No preoperative NSAID was used in prevention of clinical CME. In each checkup, performed first postoperative day, seven days, 5 weeks and 12 weeks after the operation, visual acuity with and without correction, tonometry, corneal transparency, biomicroscopy of posterior pole and measurement of macular thickness by OCT (Stratus OCT 3000, Zeiss, Germany) were performed. Preoperative visual acuity was 20/80. At first day follow-up visit the patient's visual acuity was 20/25 and at seventh day 20/20. Six weeks after the operation, the patient's vision had worsened to 20/60 after a slow ste-

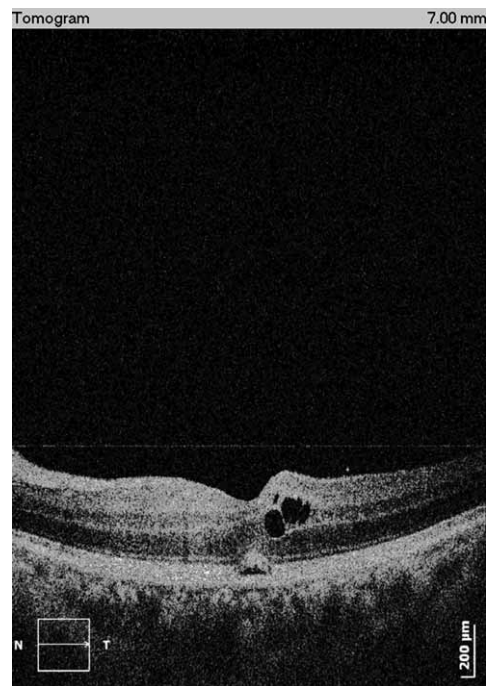


Fig. 2. Decreased macular thickness 2 weeks after starting treatment with combination of corticosteroid and non-steroidal anti-inflammatory drug.

roid taper. At that time Stratus OCT showed foveal thickening and cystic changes specific for CME (Figure 1). Combination of corticosteroid (dexametasone, Maxi-

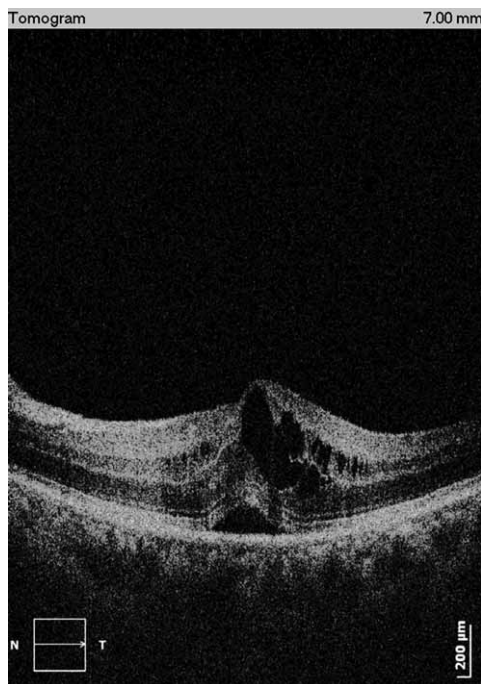


Fig. 1. Foveal thickening and cystic changes specific for cystoid macular edema 6 weeks after the cataract surgery.

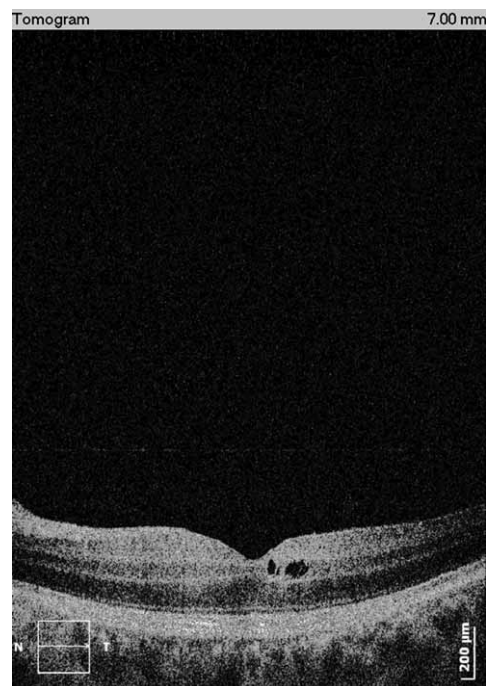


Fig. 3. Significant reduction in retinal thickness one month after starting treatment with combination of corticosteroid and non-steroidal anti-inflammatory drug.

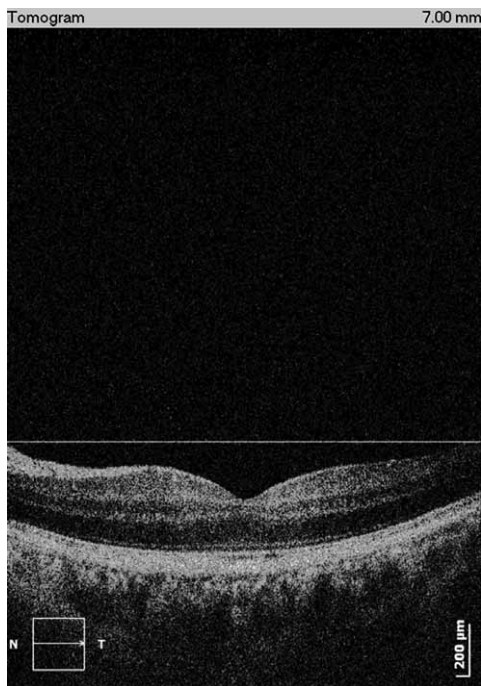


Fig. 4. Complete resolution of foveal thickening and cystic changes two months after starting treatment with combination of corticosteroid and non-steroidal anti-inflammatory drug.

dex, Alcon®, USA) and NSAID (diclofenac 0.1%, Naclof, Switzerland) four times daily was included in therapy. The dose was tapered off over the ensuing 8 weeks. The total treatment duration was 12 weeks. At first, two-weeks follow-up visit, visual acuity improved to 20/40 and the OCT demonstrated decreased macular thickness (Figure 2). On second visit, one month after the therapy was included, visual acuity was 20/30 and the OCT showed a significant reduction in retinal thickness (Figure 3). At the patients 2-month follow-up visit, vision has improved to 20/20 and the fovea appeared flat (Figure 4). Stratus OCT showed complete resolution of foveal thickening and cystic changes.

## Discussion

CME is still the most frequent cause of decreased vision after cataract surgery, although it's incidence has

declined with advantages in surgical techniques<sup>12,13</sup>. Advances in technique, instrumentation and pharmacology have increased expectations for surgical outcomes, from both the patient's and the surgeon's perspective. Less dramatic visual deficits than 20/40 may be considered clinically significant today. Patients are demanding better outcomes after cataract surgery. After a confirmed diagnosis of pseudophakic CME, OCT is an objective and relatively sensitive method of monitoring the patient's response to treatment. In all patients with pseudophakic CME, we initiate topical therapy consisting corticosteroid (dexametasone) and an NSAID (diclofenac 0.1%) 4 times a day for at least 6 weeks. If we observe a treatment response, the patient continues therapy until the edema resolves, which may take several months. Once the swelling abates, we taper the drops by one drop per week. It is still not known whether topical NSAIDs alone are as effective as the combination of topical NSAIDs and steroids. It is possible that these drugs may act synergistically to restore the blood-retinal barrier by blocking prostaglandin synthesis (NSAIDs) and decreasing intraocular inflammation (steroids). Topical therapy alone is usually effective in treating routine pseudophakic CME but it may fail in patients who have other risk factors. If no improvement occurs after 6 weeks of strict compliance, one may consider periocular or intravitreal steroids. Antiangiogenic agents should be considered for nonresponsive persistent CME. It has been shown that macular edema requests intravitreal or parabolbar injection for its resolution<sup>14</sup> (citat: Synek S, Vojnikovic B, Coll Antropol, 34(2010) 99. Pars plana vitrectomy may be indicated when macular edema is associated with epiretinal membranes, suspected retained lens fragments or pars planitis that is unresponsive to maximum medical therapy.

## Conclusion

Combination of corticosteroid (Dexametasone, Maxidex) and NSAID (Diclofenac 0.1%, Naclof) is effective and safe therapy for treating pseudophakic CME. Patient showed significant improvement in visual acuity and retinal thickness at 2 months posttreatment.

OCT is used to diagnose and monitor response to therapy. The advantages of OCT are it's high sensitivity, non-invasiveness and ability to quantify macular edema.

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## **REGRESIJA CISTOIDNOG MAKULARNOG EDEMA NASTALOG NAKON OPERACIJE KATARAKTE FAKOEMULZIKACIJOM PRIMJENOM KOMBINIRANE TOPICKE TERAPIJE KORTIKOSTEROIDIMA I NESTEROIDNIM ANTIINFLAMATORNIM LIJEKOVIMA**

### **S A Z E T A K**

Pacijentici u dobi od 69 godina operirana je katarakta lijevog oka fakoemulzifikacijom u topičkoj anesteziji te je ugrađena stražnja intraokularna leća. Nakon operacije, pacijentica je u terapiji primala kombinaciju antibiotika i kortikosteroida (tobramicin + dexametazon, Tobradex) u dozi koja se postepeno smanjivala tokom pet tjedana: jedna kap pet puta dnevno prvi tjedan, tri puta dnevno drugi do četvrti tjedan i jednom dnevno peti tjedan. Na svakom kontrolnom pregledu, prvi postoperativni dan, 7 dana, 5 tjedana i 12 tjedana nakon operacije, ispitivani su: vidna oštrina sa i bez korekcije, očni tlak, prozirnost rožnice, stražnji segment oka te je mjerena debljina makule pomoću Stratus optičke koherentne tomografije (OCT) 3000. Na prvom kontrolnom pregledu, prvi dan nakon operacije vidna oštrina je bila 20/25 ali se 6 tjedana nakon operacije smanjila na 20/60 nakon postepenog ukidanja kortikosteroida iz terapije. Na Stratus OCT-u vidjelo se foveolarno zadebljanje te cistične promjene specifične za cistoidni makularni edem (CME). U terapiju je uključena kombinacija kortikosteroida i nesteroidnog antiinflamatornog lijeka 4 puta dnevno. Doza se postepeno smanjivala kroz 8 tjedana. Terapija je trajala 12 tjedana. Na kontrolnom pregledu nakon 2 mjeseca vidna oštrina se povećala na 20/20 a fovea je bila bez zadebljanja. Na Stratus OCT-u vidjelo se da su se potpuno povukli foveolarno zadebljanje te cistične promjene. Kombinacija kortikosteroida (Dexametazon, Maxidex) i nesteroidnog antiinflamatornog lijeka (Dikolfenak 0,1%, Naclof) je učinkovita i sigurna terapija u liječenju cistoidnog makularnog edema nastalog nakon operacije katarakte fakoemulzifikacijom. Pacijentica je pokazala značajan napredak u vidnoj oštrini te foveolarnoj debljini 2 mjeseca nakon početka terapije.