

## KATARAKT AMELİYATI SONRASI GEÇ DÖNEMDE FARKEDİLEN DESCEMET MEMBRAN DEKOLMANINA YAKLAŞIM

### APPROACH TO THE DESCEMET MEMBRANE DETACHMENT THAT IS NOTICED LATE PERIOD AFTER CATARACT SURGERY

Erdoğan BOZKURT, Ersin MUHAFAZ

Kafkas Üniversitesi Tıp Fakültesi, Göz Hastalıkları Ana Bilim Dalı

#### ÖZET

Fakoemülsifikasyon cerrahisi sonrası akut kornea ödemi gelişen bir katarakt olgusunda, Descemet membran dekolmanının (DMD) ayırıcı tanısı ve tedavisini sunmayı amaçladık. 52 yaşındaki bayan hasta, sol gözde rutin fakoemülsifikasyon cerrahisi sonrası postoperatif 16. gün farkedilen DMD'ye sekonder akut kornea ödemi ve görme bozukluğu şikayeti ile kliniğe başvuruyor. Olgunun postoperatif 16. gün kontrolünde görme keskinliği sağ gözde 0.8, sol gözde ise 50cm'den parmak sayma düzeyinde olduğu görüldü. Biyomikroskopik muayenede sağ gözde nükleer skleroz, sol gözde üst temporal bölge hariç yaygın kornea ödemi izlenmekteydi. Göz içi basınçları her iki gözde normaldi. Fundus muayenesinde sağ doğal, solda net olarak değerlendirilememekle beraber göz dibi ultrasonografik olarak normaldi. DMD'den şüphelenilerek anterior segment optik kohrens tomografi (ASOCT) çekildi. ASOCT görüntülerinde korneal epitelial ve stromal ödem altında ikinci bir ön kamaraya oluşturan hiperreflektif bant fark edilmiştir. Hastaya DMD ve buna bağlı kornea ödemi tanısı konarak, ön kamaraya perfloropropan (C3F8) enjeksiyonu yapıldı. Enjeksiyonu takip eden 3. günde, parasantral descemet kırışıklıkları dışında kornea saydamdı, ön kamarada superiora gaz mevcut idi ve görme keskinliği 0,2 düzeyine çıkmıştı. Bu olgu bize 14 günü aşan DMD'lerde intrakamaral gaz enjeksiyonlarının etkili bir tedavi yöntemi olabileceğini göstermektedir.

**ANAHTAR KELİMELEER:** Korneal ödem, Descemet membran dekolmanı, Perfloropropan.

#### ABSTRACT

We aimed to present the differential diagnosis and treatment of Descemet membrane detachment (DMD) in a patient with acute corneal edema after phacoemulsification surgery. A 52-year-old female patient presented to our clinic with acute corneal edema and visual impairment secondary to DMD, which was noticed on the postoperative 16th day after routine phacoemulsification surgery in the left eye. On the 16th day, visual acuity of the case was; 0.8 in the right eye and from 50 cm in the left eye at the level of counting finger. In biomicroscopic examination nuclear sclerosis in the right eye, diffuse corneal edema except the upper temporal region in the left eye was followed. Intraocular pressures were normal in both eyes. On fundus examination, the right eye was normal and the left eye was normal ultrasonographically like the right eye although cannot be evaluated clearly. Anterior segment optical coherence tomography (ASOCT) was performed with suspicion of DMD. ASOCT images showed a hyperreflective band that was forming a second anterior chamber under corneal epithelial and stromal edema. The patient was being diagnosed with DMD and corneal edema related with this and perfluoropropane (C3F8) injection was made into the anterior chamber. On the third day following the injection, the cornea was transparent except for the paracentral descemet wrinkles, there was gas appearance in the anterior chamber and visual acuity increased to 0.2 level according to snellen. This case shows us that intracameral gas injections can be an effective treatment modality in DMDs exceeding two weeks.

**KEYWORDS:** Corneal edema, Descemet membrane detachment, Perfloropropane.

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**Yazışma Adresi / Correspondence:** Dr. Öğr. Üyesi Erdoğan BOZKURT

Kafkas Üniversitesi Tıp Fakültesi, Göz Hastalıkları Ana Bilim Dalı

**E-mail:** drerdincbozkurt@hotmail.com

**Orcid No (Sırasıyla) :** 0000-0002-5570-799X, 0000-0002-8281-8767

## INTRODUCTION

Descemet membrane is one of the 5 layers of the cornea which is about 12  $\mu\text{m}$  thick in adults and serves as the basement membrane for the endothelium. Descemet membrane detachment (DMD) was first described by Samuels in 1928 (1). It is a complication that may develop after other intraocular surgeries such as glaucoma, vitrectomy and keratoplasty, especially cataract surgery (2).

Unsuitable corneal incisions during surgery, too narrow or too long corneal tunnels, shallow anterior chamber, the use of surgical instruments, risk factors such as rupture in the Descemet membrane, small perforation and withdrawal may cause separation of the posterior stroma descemet surface and cause the formation of DMD (3). During irrigation process, viscoelastic material usage, DMD can develop by accumulating fluid between the posterior stroma and Descemet membrane without disturbing the design integrity. In addition to surgery, blunt trauma, congenital glaucoma, and corneal ectasias, as well as osteogenesis imperfecta 'has been reported to develop spontaneous DMD in some collagen connective tissue diseases (4). As a result, corneal edema resistant to medical treatments develops because it cannot perform endothelial pump function (5).

For the first time, Mackool and Holtz have classified DMD as planar (<1 mm detachment, usually spontaneous reattachment) and nonplanar (> 1 mm, surgical intervention required) for the first time (6). In the current diagnostic and therapeutic applications, different classifications have been added due to the widespread use of anterior segment optical coherence tomography (ASOCT). Jacob et al. aimed to form a new treatment scheme by classifying the regatogen, tractional, bullous and complex headings with ASOCT (7). Although spontaneous improvement of Descemet membrane detachment can sometimes be seen, the replacement of Descemet membrane is important in treatment. Although this placement can be performed with various approaches such as surgical instrument manipulation, suturing, air or viscoelastic injection to the anterior chamber, gas injections that descend the Descemet membrane with minimal manipulation are the most preferred approach (8, 9).

In this case report, the patient presented to our clinic with intensive corneal edema 16 days after cataract surgery, which was thought to be normal, and the importance of the use of ASOCT with suspected DMD and the effectiveness of perfloropropane gas were emphasized. Patient's consent form was taken along with institutional review board approval.

## CASE REPORT

A 52-year-old female patient with no other disease underwent phacoemulsification surgery to her left eye. On the first postoperative day, topical prednisolone acetate (Pred Forte 1%, Allergan) 8x1 and Moxifloxacin (Vigamox 0,5%, Alcon) 5x1 were administered and the patient was called for control on the third day. The patient, who did not come to this control, was admitted to the clinic at the post-op 16 th day with low vision. Visual acuity of the case was exact in the right eye and from 50 cm in the left eye at the level of counting finger. Biomicroscopic examination revealed clear corneal and nuclear sclerosis in the right eye. In the left eye, the cornea was commonly edematous except for a small area in the upper temporal region (**Figure 1**).



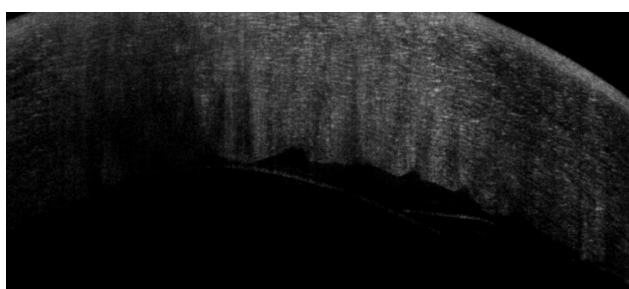
**Figure 1:** Postoperative 16th day corneal stroma with diffuse edematous appearance except upper temporal quadrant

Intraocular pressures were normal in both eyes. Fundus examination was normal in the right eye although it cannot be evaluated clearly on the left. Ocular ultrasonography retinal vitreous structures in both eyes was traced natural.

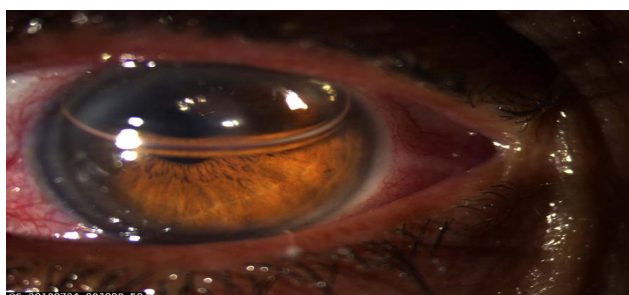
ASOCT was performed with suspicion of DMD. ASOCT images revealed a hyperreflective band forming a second anterior chamber under corneal epithelial and stromal edema (**Figure 2**).

Central corneal thickness was measured as 695  $\mu\text{m}$ . In order to avoid increasing detachment, the patient diagnosed with DMD was given an

anterior chamber with a 23 G lateral incision under topical anesthesia at the level of 10-11 hours at which the corneal edema was at least, and 10 % concentration of C3F8 (perfluoropropane) gas was given to fill the anterior chamber. The patient was recommended to lie in the supine position for a good apposition. 5 % hypertonic ophthalmic solution 5x1 was added to topical prednisolone acetate and moxifloxacin treatment which were the patient used. On the third day following the gas injection, visual acuity increased to 0,2 LogMAR and the cornea was transparent except for paracentral descemet wrinkles, and anterior chamber gas was present (**Figure 3**).

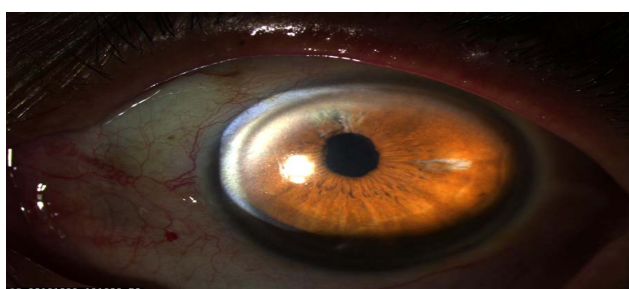


**Figure 2:** Hyper-reflective band forming a second anterior chamber under stromal edema on anterior segment optical coherence tomography images



**Figure 3:** Anterior segment structures on the third day following gas injection

Central corneal thickness decreased to 564  $\mu\text{m}$  level. In ASOCT, disappear of DMD and re-settled of Descemet membrane were seen. At the first month follow-up, the patient's visual acuity was seen that increasing to 0.07 LogMAR and the gas completely being absorbed (**Figure 4**).



**Figure 4:** Anterior segment structures at the first month following injection

## DISCUSSION

Although DMD is gradually decreasing due to developing technology and increasing knowledge and skills, it is still seen 0.5 % after phacoemulsification. The diagnosis of pseudophakic / aphakic bullous keratopathy is one of the two most common indication groups in patients undergoing corneal transplantation in our country and in the world. DMD is one of the easily treatable causes of pseudophakic bullous keratopathy (10, 11). DMD treatment is possible with a small amount of gas that can be delivered to the anterior chamber with a small incision, while the treatment of bullous keratopathy is keratoplasty.

Corneal edema may not be recognized by the surgeon, especially if the DMD occurs during the final stages of cataract surgery, such as lens placement, viscoelastic drainage, or stromal hydration of paracentesis site. In our case, we think that DMD may have developed during stromal hydration of paracentesis site at the final stage of the surgery. On the day after the surgery, according to the prevalence of descemet detachment, diffuse edema, which can involve the entire cornea, can prevent the recognition of DMD. This complicates the differential diagnosis of severe endothelial trauma, preoperative undetected endothelial insufficiency, endothelial toxicity (TASS) and descemet membrane detachment (12, 13). While DMD can be detected by careful biomicroscopic examination in the early period, it is very difficult to detect with biomicroscope in the late period due to intensive corneal edema. In these cases, DMD is suspected and further imaging methods such as ASOCT and corneal topography should be used.

While small DMD may close spontaneously, larger DMDs should be treated as soon as they are recognized for complications. As in our case, spontaneous closure of a DMD 16 days after the operation is very difficult. In these cases, Descemet membrane should be urgently apposed. Although many techniques are used for the application of Descemet membrane, the first choice is usually air because it is cheap and accessible. However, air is not preferred in long-term DMDs because of its limited efficacy, rapid absorption and increasing the risk of infection due to repeated application. Another

option is to use slowly absorbing gases such as sulfur hexafluoride (SF<sub>6</sub>) and perfluoropropane (C<sub>3</sub>F<sub>8</sub>) as buffering agents. As a result of the increasing volume of these gases in the anterior chamber due to the expansion properties, endothelial toxicity problem may occur with the increase of intraocular pressure. Therefore, it is recommended that the gases be given at a diluted concentration (14). In recent years, intracameral injections with SF<sub>6</sub> or C<sub>3</sub>F<sub>8</sub> gas have gained increasing acceptance as an effective and effective treatment option for DMD (15). In our case, DMD was suspected in the patient who admitted to the clinic 16 days after the usual phacoemulsification and was successfully treated after 10 % C<sub>3</sub>F<sub>8</sub> gas injection to the patient whose diagnosis was confirmed by ASOCT.

It is necessary to benefit from imaging methods such as ASOCT with suspected DMD in intensive corneal edema. Even in DMDs exceeding two weeks, we think that gases such as C<sub>3</sub>F<sub>8</sub> given to the anterior chamber are effective in reducing corneal edema by aposing DM.

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