

Descemet's membrane detachment during cataract surgery: a case report

Aina Pons^{1*}, Cristina Christian², Abhinav Loomba³, Sid Goel³

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ABSTRACT

Background: Descemet's membrane detachment is a possible complication after cataract surgery and has been reported to happen in 0.5% of cases after cataract surgery.

Case Presentation: A 77-year-old male patient underwent right eye cataract surgery and presented 2 weeks after surgery with decreased visual acuity (CF) in the operated right eye. There was generalized cornea edema and the Descemet's membrane (DM) was noticed to be detached at 80% of the corneal surface. At 12 days postoperatively, a descemetotomy with intracameral air bubble was performed following the principles of endothelial keratoplasty. On follow-up, the visual acuity in the right eye was 6/7.5 with complete corneal clarity at 2 months.

Conclusion: Early recognition and surgical intervention of a DM detachment at cataract surgery are likely to enable resolution without the need for a transplant. If suspected or identified at the end of surgery, anterior chamber air insertion is recommended. It is important to note that separated DM can mimic a retained anterior capsule flap. Care must be taken when considering removal of any clear membranes at the end of cataract surgery.

Keywords: Descemet's, detachment, descemetotomy, outcome, prevention.

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Correspondence to: Aina Pons

*Central Middlesex Hospital, London North West University Healthcare NHS Trust, Harrow, UK.

Email: ainapons8@gmail.com

Full list of author information is available at the end of the article.

Background

Descemet's membrane detachment (DMD) has been reported as a possible complication following cataract surgery [1]. First, described in 1928 [2], its reported incidence is approximately just 0.5% after cataract surgery and a visually significant DMD has an incidence of approximately 0.044% [3]. Some cases might be spontaneous [1]. The injury is often peripheral and often resolves without treatment. Large central DMDs, if not managed appropriately, may lead to corneal decompensation and visual damage. Overall, 8% of these require corneal transplants [4]. Patient-related risk factors have been identified for DMD including advanced age, hard cataracts, and pre-existing endothelial dystrophies. Surgery-related risk factors are prolonged surgical times, ragged clear corneal incisions, inadvertent trauma with blunt instruments or phacoemulsification probes, or premature saline or viscoelastic injections [2].

Through this case report we demonstrate surgical options to allow for early resolution of this complication avoiding progression to transplant surgery. We present learning points on prevention, identification of DMD (on the table or in outpatient setting), immediate management,

and signs and symptoms that may be observed post-operatively and that should be taken into consideration.

Case Presentation

A 77-year-old male patient with no past medical nor ophthalmological history underwent routine right eye cataract surgery in our unit. He presented at the Acute Clinic 2 weeks after surgery with decreased visual acuity (counting fingers) in the recently operated right eye. Left eye visual acuity was 6/6. On examination, there was generalized cornea edema with normal intraocular pressure. The anterior chamber was deep and quiet with no fundal view. This was initially treated as decompensated cornea and a second opinion from a cornea specialist was sought.

On specialist review the Descemet's membrane (DM) was noticed to be detached at 80% of the corneal surface but anatomically remained *in situ* (Figure 1). Anterior segment optical coherence tomography (OCT) images demonstrated the extent of the detachment (Figure 2). On reflection, this was noted to have likely happened after vigorous hydration of the main incision at the end of the cataract operation. At 12 days postoperatively, a descemetotomy with intracameral air bubble was performed following the principles of

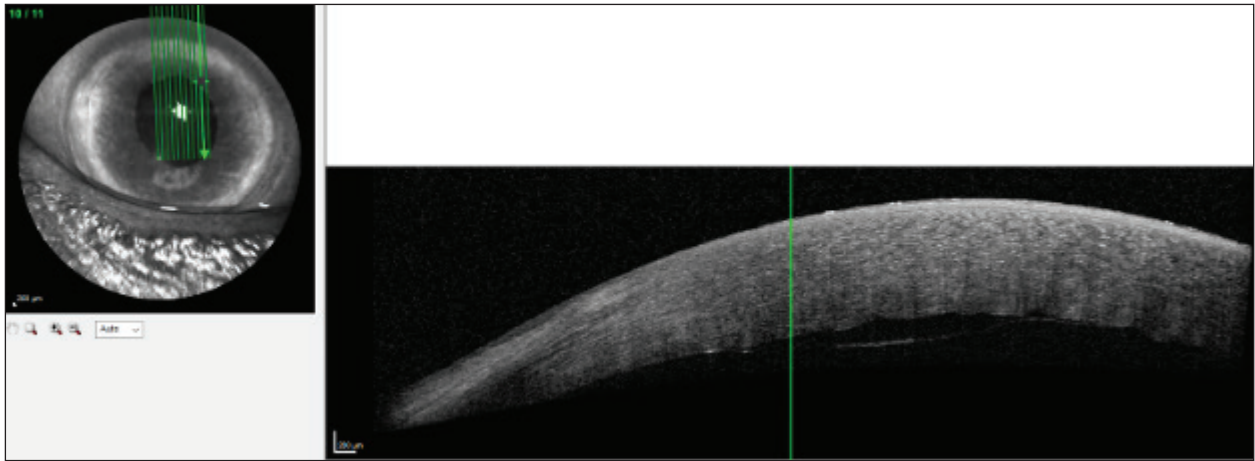


Figure 1. Anterior segment OCT images demonstrating the extent of the detachment.

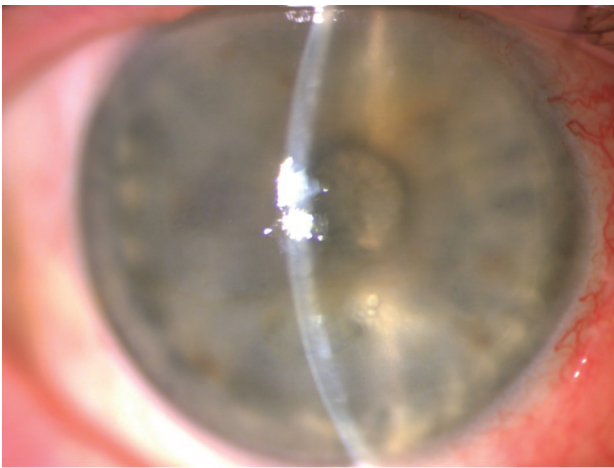


Figure 2. Preoperative appearances before descemetopexy with intracameral air bubble.

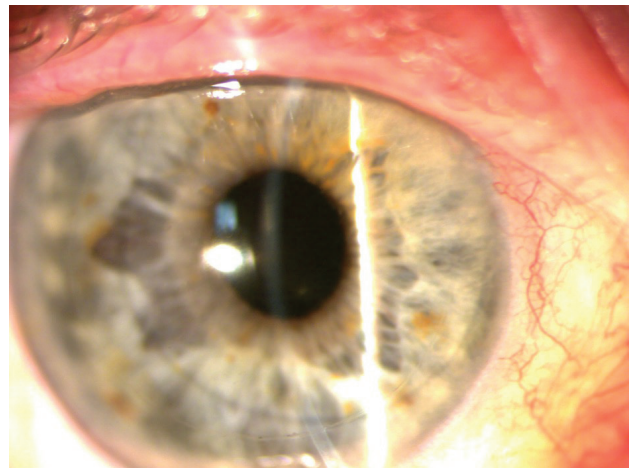


Figure 4. Postoperative appearances 1 month after descemetopexy with intracameral air bubble.

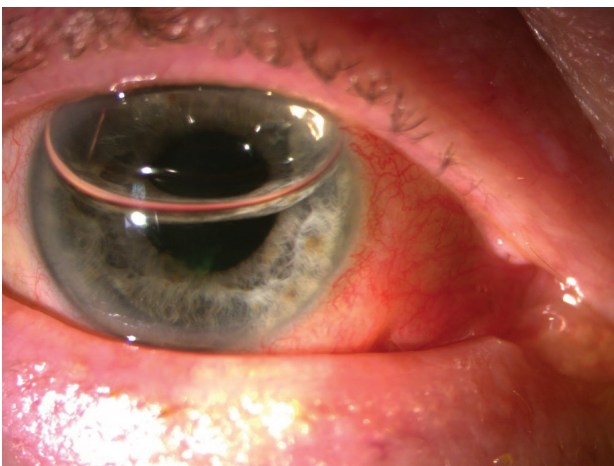


Figure 3. Postoperative appearances day 1 after descemetopexy with intracameral air bubble.

endothelial keratoplasty (Figure 3). Anterior segment OCT images also aided the pre-operative decision-making process when selecting the site of air injection. Instructions were given to the patient to posture after the procedure.

On follow-up at 1 month complete anatomical and functional improvement was achieved, and the visual acuity in the right eye was 6/7.5 with complete corneal clarity at 2 months after intracameral air injection (Figure 4). The patient underwent left eye cataract surgery after the complete resolution of the right eye complication.

Discussion

Risk factors for DMD are numerous after phacoemulsification surgery. The results of a case series suggested that friction of surgical instruments had the greatest association with incisional DMD. In this study, the authors suggested decreasing ultrasonic energy and phacoemulsification time may reduce the severity of incisional DMD [5]. In our case, vigorous hydration of the main incision at the end of the cataract operation was hypothesized to have led to DMD and identifying this as a risk factor might impact future surgical practice.

Several therapeutic options have been described to treat DMD [6] including conservational management (if small and localized at the limbus), descemetopexy (if extensive) with intracameral air, and gas; or corneal transplant.

Timeline

Day 0 - day of surgery	A 77-year-old male patient with no past medical nor ophthalmological history underwent routine right eye cataract surgery in our unit.
1 week	Acute Clinic 2 weeks after surgery with decreased visual acuity (counting fingers) in the recently operated right eye - generalized cornea oedema with normal intraocular pressure. Was initially treated as decompensated cornea and a second opinion from cornea specialist was sought.
Specialist review	DM was noticed to be detached at 80% of the corneal surface but anatomically remained in situ. Anterior segment OCT images demonstrated the extent of the detachment
12 weeks postop	Descemetopexy with intracameral air bubble was performed following the principles of endothelial keratoplasty
1 month	Complete anatomical and functional improvement was achieved, and the visual acuity in the right eye was 6/7.5 with complete corneal clarity at 2 months after intracameral air injection

Authors have reported the possibility of spontaneous DM reattachment and strengthened the importance of surgeons being aware of this to avoid unnecessary procedures [7]. Another treatment option described has been DM suturing that can reattach DM, especially in moderate to severe, recurrent DMD with fewer postoperative complications and reduce the need for corneal transplantation [8].

A retrospective study reported outcomes of post-cataract surgery DMD undergoing air descemetopexy in 112 patients. They concluded that air descemetopexy is a safe and efficient modality of treatment of DMD that should be tried even in patients with severe DMD before planning a major surgery like endothelial keratoplasty. This was consistent with our case of 80% DMD treated with air descemetopexy with an excellent outcome [9]. Importantly the ideal timing for air descemetopexy is unclear but a sooner approach might be advisable to avoid possible further endothelial cell loss due to stromal haze. In patients susceptible to glaucoma, patients that have logistic issues for repeat air pneumodescemetopexy, and precious eyes that require early visual recovery a lower concentration of C3F8 can be considered as fewer ocular complications have been recorded [10].

Interestingly, anterior segment OCT has been described in the literature as a valuable tool to identify DM detachment and its position to guide clinical treatments and improve prognosis of patients. This instrument was of use in our case, and we recommend its use in similar clinical settings [11].

Conclusion

Early recognition and surgical intervention of a DM detachment at cataract surgery are likely to enable resolution without the need for a transplant. If suspected or identified at the end of surgery, anterior chamber air insertion is recommended. It is important to note that separated DM can mimic a retained anterior capsule flap. Care must be taken when considering removal of any clear membranes at the end of cataract surgery.

What is new?

DMD is a possible complication after cataract surgery and has been reported to happen in 0.5% of cases after cataract surgery. Recognizing these early and prompt surgical interventions is likely to enable resolution without the need for a transplant. If suspected or identified at the end of surgery, anterior chamber air insertion is recommended. Care must also be taken when considering removal of any clear membranes at the end of cataract surgery.

List of Abbreviations

DM	Descemet's membrane
DMD	Descemet's membrane detachment
OCT	Optical coherence tomography

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

None.

Consent for publication

Due permission was obtained from the patient to publish the case and the accompanying images.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

Author details

- Aina Pons¹, Cristina Christian², Abhinav Loomba³, Sid Goel³
1. Central Middlesex Hospital, London North West University Healthcare NHS Trust, Harrow, UK
 2. St James Hospital, Leeds Teaching Hospitals NHS Trust, Harrow, UK
 3. Hull University Teaching Hospitals NHS Trust, Harrow, UK

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Summary of the case

1	Patient (gender, age)	77-year-old male
2	Final diagnosis	Descemet’s membrane (DM) detachment after cataract surgery
3	Symptoms	Decreased visual acuity (counting fingers) in the recently operated right eye, generalized cornea edema with normal intraocular pressure
4	Medications	Initially treated as decompensated cornea awaiting specialist review
5	Clinical procedure	Descemetopexy with intracameral air bubble
6	Specialty	Cornea