Brief Communication

Role of Anterior Segment OCT in Cases of Post Cataract Surgery Corneal Edema

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ABSTRACT

Post cataract surgery corneal edema is a disturbing complication both for the patient and the surgeon. We present a case of post cataract surgery corneal edema. A 61 year old lady developed right corneal edema after an uneventful phacoemulsification. Initially diagnosis of surgery induced corneal endothelial decompensation was made. Anterior segment OCT was performed that revealed detached Descemet membrane. Intraocular SF6 gas injection successfully treated the case. Anterior segment OCT is a valuable tool in cases of post cataract surgery corneal edema to establish a diagnosis.

Key Words: Corneal Edema, Descemet Membrane, Phacoemulsification.

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INTRODUCTION

Corneal transparency is vital for its optimum optical function. Corneal detergence is a key component responsible for corneal transparency and endothelial pump plays a key role in it. Unlike other structures that make up cornea, endothelium does not regenerate. Delicate endothelium must be respected. Once it is damaged it is gone forever. Endothelium rests on Descemet's membrane. Any factor that directly damages endothelium or strips off the Descemet's membrane, it results in loss of corneal transparency.

Descemet membrane detachment (DMD) is a serious complication of cataract surgery.[1] After cataract surgery incidence of DMD varies from 0.04% to 0.5%.[2,3] Descemet membrane often detaches at the entry point of main phacoemulsification incision. Inaccurate incision construction, suboptimal quality of keratome, trauma during insertion of phaco tip and surgical manoeuvre, repeat or complicated surgery, shallow anterior chamber and injection of hydration fluid between the stroma and the Descemet membrane are plausible causes.[4]

Mild cases of DMD can spontaneously recover while severe cases need surgical intervention otherwise irreversible corneal endothelial damage can occur. Management options include air or gas tamponade, fixation by suture, drainage of interface fluid and Keratoplasty.[5]

We present a case of post cataract surgery corneal oedema caused by DMD. Corneal OCT helped in diagnosis where clinical examination was not indicative of DMD.

Case Presentation

A 61-year old lady came to our department with complaint of decreased vision in her right eye. On examination, there was nuclear sclerosis (grade 2). Patient underwent phacoemulsification with intraocular lens implantation. Surgery was uneventful. Next day the visual acuity in the operated eye was finger counting at 6 inches. On slit lamp examination, there was corneal edema. Grade 4 corneal striate extended from limbus to limbus. Details of anterior chamber, iris and lens were barely visible. Surgery

induced corneal endothelial decompensation was suspected and patient was advised topical steroid-antibiotics combination drops and topical hypertonic saline drops two hourly. Topical betablockers eye drops were also added twice daily. Patient counselling was done and follow up was planned after a week. On next visit, there was no improvement in clinical picture of the patient. Patient was referred to another colleague for second opinion. Second opinion turned out with diagnosis of Toxic Anterior Segment Syndrome (TASS) and systemic steroids 1 mg/kg body weight was added to the existing treatment with no improvement. Corneal OCT was done (Revo nx, Optopol; OCT machine) which revealed stripping off of the Descemet membrane with attachment at few spots nasally (Figure 1). A bubble of 100% SF6 gas in a volume of 0.1ml was placed in the anterior chamber. Patient was monitored for rise in intraocular pressure in the first six hours of gas injection as this was the time of maximum volume expansion. Pupil was kept dilated to avoid pupil block by gas bubble. On next day, cornea showed signs of improvement. There was no edema, corneal striations were minimal. Due to the presence of gas in the anterior chamber the vision was 6/60. Anterior segment OCT was repeated which showed that the Descemet membrane was attached leaving wrinkling at few places (Figure 2). Patient was advised to report after one week at which the best corrected visual acuity was 6/6, cornea was clear and a very small bubble of SF6 gas sparing the pupil in the sitting position was seen in the anterior chamber. Corneal OCT was repeated and Descemet membrane was completely attached (Figure 3).

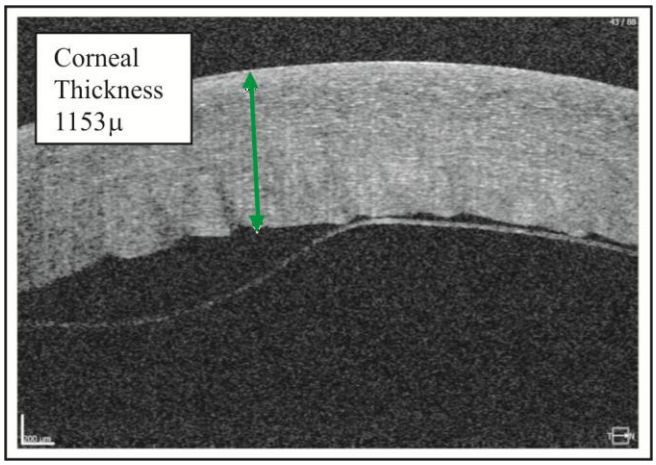

Figure 1: Anterior Segment OCT before placing SF6 gas bubble in the anterior chamber.

Figure 2: Anterior segment OCT one day after placing SF6 gas bubble in the anterior chamber.

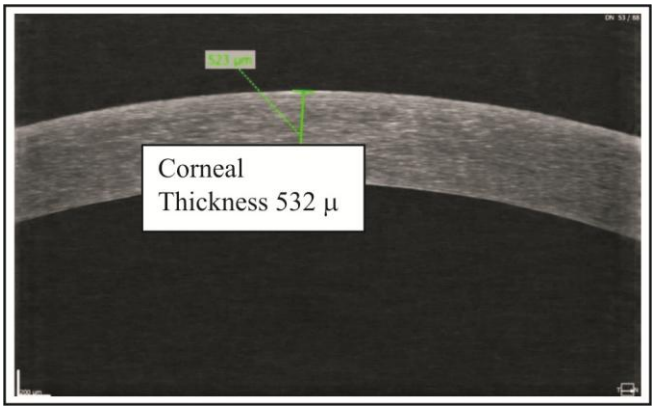

Figure 3: Anterior segment OCT seven days after placing SF6 gas bubble in the anterior chamber.

DISCUSSION

Anterior segment OCT has emerged as a remarkable tool that helps in making correct diagnosis and treatment plan in challenging cases of Descemet membrane detachment where conventional clinical examination provides insufficient information. In our study, corneal edema did not allow the ophthalmologists to evaluate cornea. The diagnosis was not clear until anterior segment OCT revealed DMD as the cause of corneal edema. Our impression is similar to other authors who have emphasized the use of anterior segment OCT in evaluating corneal edema.[5] Jiang and co-authors also described the importance of anterior segment OCT in post cataract surgery corneal edema and its management.[6]

In our case, the surgery was uneventful. The most probable cause of DMD was excessive hydration of the corneal side ports which might have inadvertently caused separation of Descemet membrane. This was endorsed by the findings of Wang and colleagues who

also indicated that the inappropriate hydration of corneal side ports might result in DMD.[7]

We recommend being gentle and vigilant while hydrating side ports. Over hydration should be avoided. Hydration cannula must be in the correct plane that is in the middle stroma. It should not be in the deep stroma or close to Descemet membrane.

In our case, placing SF6 gas bubble resulted in reattachment of Descemet membrane and bringing back clarity of the cornea. There are other reports in which DMD was successfully treated by placing SF6 gas into the anterior chamber.[8] Some surgeons place an air bubble in the anterior chamber at the end of the cataract surgery. An air bubble may be helpful in reattaching the Descemet membrane if accidental detachment of the Descemet membrane occurred. We suggest placing air bubble in anterior chamber at the end of phacoemulsification when there is suspicion of Descemet membrane detachment.

It cannot be over emphasised that without performing an OCT scan, we might have missed the diagnosis and patient might have suffered permanent visual disability. So anterior segment OCT should be part of work up for post-surgical corneal oedema.

CONCLUSION

DMD is a serious complication of cataract surgery. Anterior segment OCT is a valuable tool to establish a diagnosis in cases of post cataract surgery corneal edema.

Conflict of Interest: Authors declared no conflict of interest.

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Authors' Designation and Contribution

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