

Descemet's membrane detachment caused by inadvertent vancomycin injection

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Descemet's membrane detachment is a condition with a wide range of etiologies. The most common cause is a localized detachment occurring after cataract surgery. We report a case of vancomycin injection-induced Descemet's membrane detachment as a complication following a routine cataract surgery and its management.

Key words: Cataract surgery, Descemet's membrane detachment, vancomycin

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Descemet's membrane detachment (DMD) can occur during anterior segment ocular surgery with instrumentation¹ or following inadvertent injection of fluid just posterior to the corneal stroma (or in the very posterior stroma).^{2,3} In the former, the detached Descemet's membrane (DM) may hang in a scroll-like manner in the anterior chamber (AC) from its root of attachment to the corneal stroma. On the contrary, in the latter situation the injected fluid in the corneal stroma causes hydrodissection and separation of the DM along with the corneal endothelium and it remains attached to the stroma all around beyond the site of detachment. This report documents a case of DMD following intrastromal injection of vancomycin and its treatment and recovery.

Case Report

An 85-year-old gentleman reported for cataract surgery in his left eye. Routine preoperative slit-lamp examination (SLE) of the left eye revealed ectopic pupil with peripheral anterior synechiae from 9 to 11 o'clock position with atrophic iris changes in that sector (the patient did not have any history of ailment, injury or surgery in the left eye) and nuclear sclerotic (Grade III) cataract. Corneal status, AC depth, intraocular pressure and ocular fundus were within normal limits in the left eye. Ultrasound biomicroscopy (UBM) of the left eye revealed complete obliteration of the angle recess from 9 to 11 o'clock position along with atrophy of the adjoining iris and ciliary body.

The patient underwent routine, uneventful phacoemulsification with foldable intraocular lens implantation (Acrysof, Alcon) under topical anesthesia through a 2.75 mm clear corneal tunnel (superior) and two corneal sideports. At the

end of the surgery, during intracameral injection of vancomycin hydrochloride (Vancocin) with a 27-gauge cannula through the three o'clock sideport, the drug was injected inadvertently into the corneal stroma resulting in DMD involving about half of the cornea. Immediately a cellophane-like reflex from the surface of the detached DM was seen under the operating microscope. The detachment was managed with intracameral injection of sterile air. A 27-gauge cannula was introduced through the 10 o'clock sideport and advanced into the AC parallel to the iris plane till the tip of the cannula was clearly in the AC. Air was injected with the cannula facing posteriorly and forming a single, large, full-chamber air bubble in the AC, flattening the detached membrane on to the stroma and acting as a tamponade. The patient was discharged with topical steroid-antibiotics and hyperosmotic saline eye drops and advised to maintain supine (face up) position.

First postoperative day vision was 20/200 (pinhole). The SLE showed corneal stromal edema, apposition of DM except in its inferotemporal quadrant and a freely moving half chamber air bubble in the AC with an otherwise quiet eye. Corneal edema started subsiding clinically from the fifth postoperative day, but a curvilinear border demarcating the attached and detached DM was still identifiable [Fig. 1] along with minimal DMD [Fig. 2].



Figure 1: Slit-lamp photograph (5th postoperative day) showing curvilinear border (arrows) demarcating the attached and detached Descemet's membrane



Figure 2: Slit-lamp photograph showing reducing Descemet's membrane detachment (inset showing magnified view)

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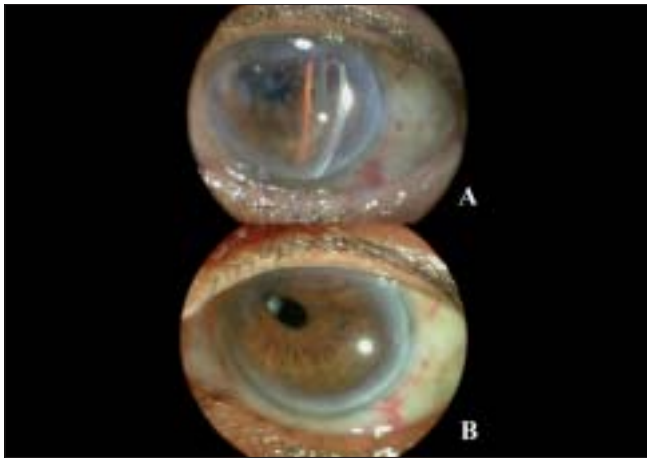


Figure 3: Comparative postoperative photographs showing reducing corneal edema with complete reattachment of Descemet's membrane. A. First postoperative week (third postoperative day) and B. Twelfth postoperative week

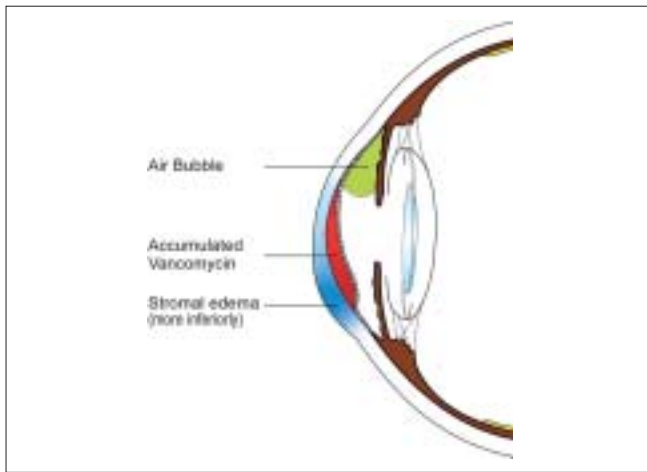


Figure 4: Schematic diagram showing DM detachment with the accumulated vancomycin in the intrastromal pocket

Progressively the cornea cleared from center to periphery and the DMD was completely re-attached by the eighth postoperative week. On the last follow-up (12th week), the best corrected visual acuity was 20/30 with a SLE showing quiet anterior segment without any clinically detectable corneal edema [Fig. 3].

Discussion

Descemet's membrane detachment is neither rare, nor always a benign problem with a wide range of etiologies. The most common cause is a localized detachment occurring during instrumentation in cataract surgery^{1,4}, higher incidence being observed in clear corneal procedures.⁴ It is also seen following uncomplicated clear corneal phacoemulsification.⁵ It may occur following inadvertent intracorneal injection of fluids like viscoelastics^{2,3,6,7} and is also possible with other fluids like balanced salt solution, adrenaline and antibiotics. Small and localized DMDs are insignificant and resolve spontaneously with medical management. Large DMDs are rare and may cause vision loss because of subsequent corneal decompensation. These require surgical treatment like internal tamponade using

air or non-expansile mixture of perfluoropropane (C3F8) or sulphur hexafluoride (SF6) gas in the AC.^{8,9}

In our case vancomycin hydrochloride solution (1 mg/0.1 ml) was inadvertently injected into the corneal stroma at the clear corneal sideport incision resulting in a planar DMD affecting nearly half the cornea and was attached all around the fluid pocket except at the injection site. The air injected into the AC could not express out the intracorneal pocket of fluid and appose the DMD immediately as accidental injection site had closed by corneal tissue edema. Buoyancy of the injected tamponading air bubble in the AC along with the corneal endothelial pump action, supportive hygroscopic action of the hyperosmotic saline solution helped in re-attachment of the DMD [Fig. 4].

It was observed that the inadvertent injection of 0.1 ml of the antibiotic vancomycin hydrochloride at the strength of 1 mg/0.1 ml into the corneal stroma did not result in any clinically detectable signs of corneal scarring or endothelial damage till the last follow-up (12th postoperative week). Knowledge of the possible effects of antibiotic agents and their diluents on the corneal stroma in their intracameral dose is limited. Sandboe *et al.*, have reported that vancomycin in the concentration of 1.0 mg/ml is nontoxic to the rabbit endothelium.¹⁰ A PubMed search revealed case reports of DMD following accidental injection of fluids like viscoelastics.^{2,3,6,7} This report, we believe, is the first documentation of DMD induced by injection of vancomycin. At the last follow-up, there was excellent anatomical and functional recovery and we could not detect any significant corneal endothelial or stromal damage following intrastromal injection of vancomycin. However, it is difficult to predict the long-term clinical course and a longer follow-up is necessary for drawing any conclusion regarding corneal toxicity of the antibiotic. The current case adds to the spectrum of causes of DMD that can occur during routine cataract surgery and its subsequent management.

Conclusion

A routine approach of DMD management is recommended even for vancomycin hydrochloride-induced DMD.

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References

1. Aust W, Wernhard U. Defects of Descemet's membrane a complication in cataract extraction with lens implantation. *Dev Ophthalmol* 1987;13:20-9.
2. Luke C, Dietlein T, Jacobi P, Konen W, Kriegelstein GK. Intracorneal inclusion of high-molecular-weight sodium hyaluronate following detachment of Descemet's membrane during viscocanalostomy. *Cornea* 2000;19:556-7.
3. Kim CY, Seong GJ, Koh HJ, Kim EK, Hong YJ. Descemet's membrane detachment associated with inadvertent viscoelastic injection in viscocanalostomy. *Yonsei Med J* 2002;43:279-81.
4. Marcon AS, Rapuano CJ, Jones MR, Laibson PR, Cohen EJ. Descemet's membrane detachment after cataract surgery: Management and outcome. *Ophthalmology* 2002;109:2325-30.

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5. Kim IS, Shin JC, Im CY, Kim EK. Three cases of Descemet's membrane detachment after cataract surgery. *Yonsei Med J* 2005;46:719-23.
 6. Ostberg A, Tornqvist G. Management of detachment of Descemet's membrane caused by injection of hyaluronic acid. *Ophthalmic Surg* 1989;20:885-6.
 7. Hoover DL, Giangiacomo J, Benson RL. Descemet's membrane detachment by sodium hyaluronate. *Arch Ophthalmol* 1985;103:805-8.
 8. Mascari MS, Gainer KM, Chisholm L. Repair of Descemet's membrane detachment with perfluoropropane (C₃F₈). *Cornea* 1998;17:129-34.
 9. Kremer I, Stiebel H, Yassur Y, Weinberger D. Sulfur hexafluoride injection for Descemet's membrane detachment in cataract surgery. *J Cataract Refract Surg* 1997;23:1449-53.
 10. Sandboe FD, Medin W, Bjerkens R. Toxicity of vancomycin on corneal endothelium in rabbits. *Acta Ophthalmol Scand* 1998;76:675-8.
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