Volume : 3 | Issue : 7 | July 2014 • ISSN No 2277 - 8179

Research Paper

Air Descemetopexy as a Treatment of Iatrogenic Descemet's Membrane Detachment

Medical sciences

KEYWORDS : Air Injection, Descemet's Membrane Detachment (DMD), cataract,descemetopexy.

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ABSTRACT

Descemet's membrane detachment(DMD) is not an uncommon occurrence during cataract surgery, however large detachments are rare and can lead to substantial diminution of vision. Early recognition and appropriate management is the key to a favorable visual outcome.

In this report, we present a case of DMD and its management by intracameral air injection. In our method, we neither injected expanding gas nor used a suture. Consequently, there was little chance of increased intraocular pressure or suture-induced astigmatism. This technique may be considered a relatively safe and simple surgical method for the management of postoperative DMD.

Introduction

Descemet's membrane detachment (DMD) is not an uncommon occurrence during cataract surgery, however large detachments are rare and can lead to substantial diminution of vision.[1,2]It was diagnosed by Weve in 1927. A tear in the Descemet's membrane (DM) can progress into a large detachment by continued traction on the torn edge of the DM by any intraocular instrumentation or manipulation.

Mackool and Holt zclassified the DMD into two groups:

Planar DMD where DM separation from its overlying corneal stroma is less than one mm; and nonplanar DMD where DM separation from its overlying corneal stroma is greater than one mm. Each of these groups are divided into two subgroups - peripheral and combined. In peripheral DMD, the detachment is merely confined to the peripheral cornea, but in combined DMD the detachment involves both peripheral and central cornea.[3]

DMD can be localized, extensive or total and can cause corneal edema, diminution of vision and permanent corneal decompensation.[4,5] The incidence is 2.6% in Extra Capsular Cataract Extraction (ECCE) and 0.5% in phacoemulsification.[6,7] Vastine et al suggested surgical intervention for large non- planar and scrolled detachments.[8] In extensive DMD, early surgical treatment is recommended to achieve good results.[3] In this article, we report a relatively easier and effective technique of intracameral air injection for repairing iatrogenic DMD and reverse the corneal edema.

Case History

A 65 year old female patient came to our centre with history of left eye cataract surgery done one month back. She complained of pain, watering, diminution of vision and foreign body sensation starting one week post-operatively. She was a known diabetic on oral hypoglycemic medication. On examination of left eye, her BCVA was 6/24. Slit-lamp examination (SLE) revealed a combined non-planar DMD with scrolling in temporal quadrant extending upto the central cornea with corneal edema.There was a vertical tear in the DM from which the scrolled up DM was hanging into the anterior chamber.



Figure 1- Non-planar combined DMD with scrolling

Intraocular pressure (IOP) in her left eye was 14 mm Hgby non contact tonometry. Initially, medical therapy was instituted consisting of combination of topical Ofloxacin 0.3% and Prednisolone acetate 1% six times a day and hyperosmotic agent (6% NaCl ointment twice daily). On follow up after one week,her symptoms worsened and on examination, her BCVA worsened to 6/60 and cornea showed presence of bullae in the temporal region with increasing corneal edema. We decided to intervene at this stage and the patient was taken for intracameral air injection in the operating room.

Surgical technique:Under peribulbar anaesthesia, two side-ports were made - one in the region of DMD and other at the meridian 180° away from the first side port. The scrolled DM was tried to unscroll by injecting Balanced Salt Solution (BSS) from the second side-port with the idea that the fluid will flow towards the first side port unscrolling the DM. But the DM was not getting unscrolled only with BSS. Hence it was done using injection of viscoelastic substance (2 % Hydroxy Propyl Methyl Cellulose) into the anterior chamber injected from the second side port. The viscoelastic substance was then completely removed from the anterior chamber replacing it with BSS and making sure that the detached DM was now freely mobile. Then by inserting a 27 guage bluntcannula towards the central cornea close to the pupil, air was steadily injected into the anterior chamber to form a large, full chamber air bubble thus reattaching the DMD by the tamponade effect of the air bubble. This resulted in uniform attachment of the DM without any folds. This full chamber air bubble was left in the anterior chamber for 3 minutes and then the cannula was introduced into the anterior chamber and the size of the air bubble was decreased to prevent postoperative rise of IOP.

Post operative Results :-

On first post operative day, the cornea was much clear and SLE showed minimal stromal edema but uniform attachment of DM without any gaps or folds. There was residual air bubble in the anterior chamber. Visual acuity was not measured as air bubble was covering the pupillary area. She was started on combination of "Ofloxacin" and "Prednisolone" acetate six times /day and Homatropine (2%) eye drops twice a day.

On the third post operative day, the air bubble was absorbed completely. The cornea was clear and her uncorrected visual acuity increased to 6/12. Her Central Corneal Thickness (CCT) was 520 µm and IOP was 14mmHg.

Volume : 3 | Issue : 7 | July 2014 • ISSN No 2277 - 8179



Figure 2- Third postoperative day- completely attached DMD without folds

On fifteenth post operative day her cornea was clear and the DM was uniformly attached.



Figure 3- Fifteenth postoperative day showing clear cornea with complete resolution of DMD.

IOP was12mmHg and CCT was 502 µm. Her BCVA was 6/6 and the patient was very happy with the surgical result.

Discussion :

Iatrogenic DMD is a complication that can have serious impact on postoperative visual outcome, if not treated adequately and in time. Mackool and Holtz reported that planar DMD's are more likely to resolve spontaneously and non- planar DMD's should be repaired early.[3] Assia et al divided DMD's into those with or without scrolling. Detachments without scrolling are more likely to resolve spontaneously.[9] The DMD in our case was of non- planar and combined ("central" and "superotemporal") type with scrolling .

As the natural history of DMD has not been completely understood, the suitable timing of intervention is unknown.

The treatment options include-

1) Conservative approach in the form of topical steroids and hyperosmotic agents.
2) Surgical options are- intracameral air injection,[1,10] supradescemet's fluid drainage with intracameral air, [11]intracameral injection of viscoelastic agents[12] transcorneal suturing.[6,10]

Expandable gases like 14% perfluoropropane (C_3F_8)[13]or 20% sulphur hexafluoride (SF_6)[14]can be injected intracamerally.

If above management fails, then Keratoplasty is the treatment.[15]

Since the DMD in our case was non- planar, combined ("central" and "superotemporal") with scrolling, early intervention in this case led to complete recovery of visual acuity with uniform attachment of the DM. Hence, we recommend the technique of intracameral air injection for non-planar, combined DMD's with scrolling as we believe that this is relatively safe easier and cheaper method for DMD and should be considered as the mode of initial intervention for DMD's.

REFERENCE

1. Aust W, Wernhard U. Defects of Descemet's membraneas a complication in cataract extraction with lensimplantation. DevOphthalmol. 1987; 13: 20–29. | 2. Macsai MS. Total detachment of Descemet's membraneafter small incision cataract extraction. Am JOphthalmol.1992; 114: 365-6. | 3. Richard J. Mackool, MD; S. Jerome Holtz, MD.Descemet Membrane DetachmentArchOphthalmol.1977; 95: 459-63. | 4. Zeiter HJ, Zeiter JT. Descemet's membrane separation during five hundred forty-four intraocular lens implantations. 1975-1982. J Am Intraocul Implant Soc. 1983;9:36–39. | 5. Makley TA, Jr, Keates RH. Detachment of Descemet's membrane with insertion of an intraocular lens.Ophthalmic Surg. 1980;11:492–494. | 6. Pahor D, Gracner B. Surgical repair of Descemet's membrane detachment. CollAntropol. 2001; 25: 13-6. | 7. Khng CY, Voon CW, Yeo KT. Causes and management ofDescemet's Detachment associated with cataractsurgery not always a benign problem. Ann AcadMed.Singapore. 2001; 30: 532-5. | 8. Vastine DW, Weinberg RS, Sugar J, Binder PS.Stripping of Descemet'smembrane associated with intraocular lens implantation. Arch Ophthalmol. 1983;101: 1042–5. | 9. Assia EI, Levkovich-Verbin H, Blumenthal M. Management of Descemet's membrane detachment. JCataract Refract Surg. 1995; 21: 714–7. | 10. Amaral CE, Palay DA. Technique for repair of Descemet's membrane detachment.Am J Ophthalmol.1999; 127: 88-90. | 11. Ghaffariyeh A, Honarpisheh N, Chamacham T. Supra-Descemet's fluid drainage with simultaneous airinjection: An alternative treatment for Descemet's membrane detachment. Middle East Afr J Ophthalmol.2011; 18: 189-91. | 12. Donzis P B, AKarcioglu Z, Insler M S. Sodium hyaluronate (Healon) in the surgical repair of Descemet's membrane detachment. Ophthalmic Surgery.1986; 17: 735-7. | 13. Macsai M S, Gainer K M, Chisholm L. Repair of Descemet's membrane detachment with perfluoropropane (C3F8) Cornea. 1998; 17: 1242-4. | 14. Gault JA, Raber IM. Repair of Descemet's membrane detachment with intracameral injection of 20% sulfur hexafluoride gas. Cornea.1996; 15: 483-9. | 15. Mulhern M, Barry P, Condon P. A case of Descemet's membrane detachment during Phacoemulsification surgery.Br J Ophthalmol.1996; 80: 185–6.