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Anchal Thakur
MBBS, M.S, FICO
Senior Research Associate
Advanced Eye Centre,
Postgraduate Institute of Medical
Education and Research, Sector 12,
Chandigarh, India

Amit Gupta
MBBS, M.S. Professor,
Anchal Thakur, MBBS, M.S,
FICO, Advanced Eye Centre,
Postgraduate Institute of Medical
Education and Research, Sector 12,
Chandigarh, India

Natasha Gautam
Senior Resident, Advanced Eye
Centre, Postgraduate Institute of
Medical Education and Research,
Sector 12, Chandigarh, India

Sabia Handa
Senior Resident, Advanced Eye
Centre, Postgraduate Institute of
Medical Education and Research,
Sector 12, Chandigarh, India

Correspondence

Amit Gupta
MBBS, M.S. Professor,
Anchal Thakur, MBBS, M.S,
FICO, Advanced Eye Centre,
Postgraduate Institute of Medical
Education and Research, Sector 12,
Chandigarh, India

A new surgical technique the 'rolling-bud' manoeuvre for descemet's membrane detachment

Anchal Thakur, Amit Gupta, Natasha Gautam and Sabia Handa

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Abstract

Descemet membrane detachment (DMD) is a rare but known complication of cataract surgery. On 1st postoperative day, a relatively prominent corneal edema in superior half of cornea helps in the recognition of this treatable situation. Anterior segment optical coherence tomography (AS-OCT) can detect and quantitatively monitor the reduction of corneal edema along with valuable documentation. The authors used intracameral C₃F₈ (14%) along with the 'rolling-bud' manoeuvre which helped in successful reattachment of DMD. We hereby describe this innovative manoeuvre which can accelerate the recovery of corneal edema in a patient with post phacoemulsification DMD.

Keywords: Descemet membrane detachment, C3F8, rolling bud manoeuvre, management

Introduction

DMD is still one of the most serious complications of cataract surgery. The incidence of clinically significant DMD after phacoemulsification varies between 0.044 and 0.5%.¹ Major etiological factors include the use of blunt surgical knives, incision morphology, aggressive stromal hydration and during intraocular lens insertion^[2].

In the presence of early postoperative corneal oedema and inflammation, the clinical diagnosis of small localised DMD is challenging. This renders the novel anterior segment imaging techniques like anterior segment optical coherence tomography (AS-OCT) useful in diagnosing as well as knowing the accurate site, extent and configuration of DMD^[3]. Postoperatively, AS-OCT also helps to confirm the adequate apposition of Descemet's membrane to stroma. Although modalities like intra-operative OCT help to document as how early the descemet's gets attached, it is an expensive tool and availability in our centre was difficult.

Management is largely dependent on intracameral injection of expansile gases like C₃F₈ or SF₆^[4-6]. Menezo *et al* reported one of the earliest cases signifying the role of paracentesis with air tamponade for DMD after cataract surgery^[7]. Ghaffariyeh *et al* successfully attempted supra-descemet fluid drainage with corneal venting incisions for DMD after phacoemulsification without the use of any air/gas tamponade^[8].

Hereby, we report a new technique which was carried out successfully on 25 cases of post phacoemulsification DMDs. Three of the cases presented as late as 4-8 months after cataract surgery. These were diagnosed with the help of AS-OCT and managed successfully with intracameral C₃F₈ gas injection along with this unique manoeuvre which helped in better stromal apposition and accelerated resolution of corneal edema.

Technique

We describe a simple, safe and effective technique that can be performed by any ophthalmologist. The only instruments required are a standard Barraquer eyelid speculum, a 30 gauge needle with a syringe for paracentesis, a 30 Gauge needle on a syringe with 14% C₃F₈ gas and a wet cotton bud for performing the rolling bud manoeuvre.

After appropriate sterile cleaning and draping the patient, a few drops of local anaesthetic are placed into the eye, and eye speculum is applied. We recommend placing the 30 Gauge needle for paracentesis temporally for the comfort of the surgeon. (Figure.1A). The 30 Gauge needle with the syringe containing 14% C₃F₈ is injected depending on the location of the flap of DMD (injected opposite to the site of DMD) completely filling the anterior chamber. (Figure.1B).

A wet cotton tip applicator is rolled towards the edge of the DMD. This leads to better apposition of DMD with the overlying corneal stroma. This 'rolling bud' manoeuvre is to be repeated for 4-5 times in one direction gently with a full air bubble in the anterior chamber. (Figure 1C, D, E). Subsequently a small amount of gas is removed, so that the anterior chamber is two third filled. (Figure 1F). This is done so as to decrease the chances of postoperative intraocular pressure rise. Topical antibiotic is put in the conjunctival sac at the end of procedure. Proposed mechanism of 'Rolling-bud' manoeuvre- The Descemet's membrane is generally detached inadvertently from

corneal entry sites (Main port > Side ports) during the cataract surgery. The attached junction is central while detached portion is peripheral providing the direction of 'milking-out' of fluid from detached membrane- stromal interface. This helps additionally to the internal tamponade provided by the air bubble. (Figure 2 A, B, C, D).

The sooner the DM reattaches to the stroma, the lesser is the stromal odema and faster is the recovery, making this technique a considerable option in cases where the DM detachment is large.



Fig 1A: Paracentesis with a 30 G needle.



Fig 1B: 14% C₃F₈ is injected opposite to the site of DMD completely filling the anterior chamber.



Fig 1 C, D, E: A wet cotton tip applicator is rolled towards the edge of the DMD 4-5 times in one direction.



Fig 1F: Small amount of gas is removed; the anterior chamber is two third filled at the end of the procedure.

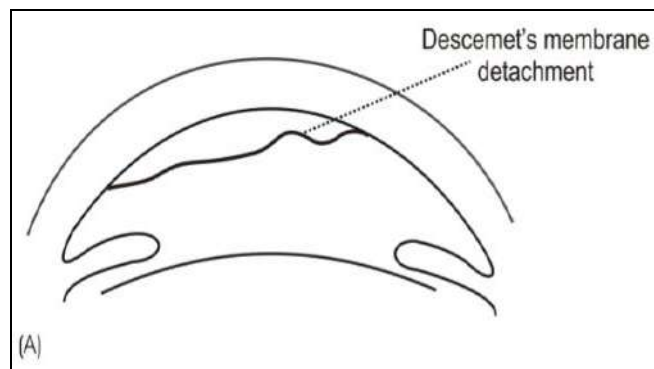


Fig 2A: Shows edematous cornea with underlying Descemet's membrane detachment and anterior chamber is full of aqueous.

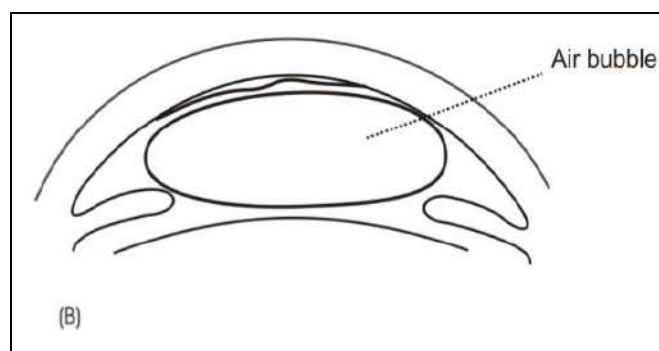


Fig 2B: After the injection of air bubble into anterior chamber, the detached Descemet's membrane is seen in close apposition (not attached) with corneal stroma.

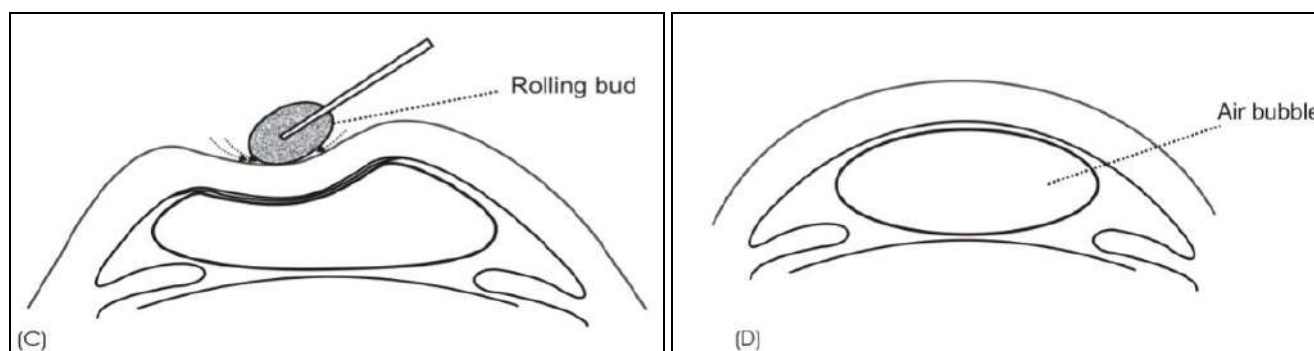


Fig 2C, D: 'Rolling-bud manoeuvre' over the cornea provides a constant and directed external pressure in addition to internal tamponade to DM by air bubble. This might be beneficial in 'milking out' the interface fluid helping earlier and stronger DM reattachment to stroma.

Discussion

In the management of DMD after cataract surgery, the sooner and prolonged is the re-attachment the better is the corneal clarity and visual outcome. Hence, for its prompt and appropriate management, a high index of suspicion and

diagnosis in early postoperative period becomes essential [9]. In patients having subclinical or occult DMD's, AS-OCT can prove to be a good diagnostic and monitoring tool [3].

Our technique, in which the mechanical 'rolling-bud' manoeuvre is used for the quicker apposition of DMD to the

corneal stroma, provided good outcome in all our patients. Moreover, this with this technique DMD as old as 8 months got attached and resulted in a successful outcome. Following the fact that the sooner the DM reattaches to the stroma, the lesser is the stromal odema and faster is the recovery, this technique is a considerable option in all the cases where the DMD is managed with intracameral gases.

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