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OUTCOMES OF DESCEMETOPEXY FOR DESCEMETS MEMBRANE DETACHMENT POST CATARACT SURGERY

Ophthalomology

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ABSTRACT

Aim: To study the efficacy of Air descemetopexy in the management of DMD. **Materials And Methods:** Clinical data of 26 patients during the period of 1st January 2024 to 30th November 2024, who developed DMD after cataract surgery were analyzed. Grade of cataract, type of surgery, visual outcomes were recorded. AS-OCT-based HELP algorithm was used for diagnosis and determining management. **Results:** Out of 28 patients with DMD, 11 patients underwent medical management and 17 patients underwent surgical management .The male: female ratio of study patients was 5:9, the mean age of the patients in the present study was 64.12±5.12 years. Out of 26 patients 22 patients underwent MSICS and 4 patients underwent phacoemulsification. Out of 17 patients, 14 patients underwent descemetopexy with air and 3 patients14% C3F8 gas was injected. Reintervention was performed in one patient with C3F8 where Air Descemetopexy failed. **Conclusion-** Air descemetopexy is a safe & efficacious option for DMD repair in most of the cases and it is associated with less postop complications.

KEYWORDS

DMD, Air Descemetopexy, visual acuity, AS- OCT.

INTRODUCTION

Descemet's membrane detachment (DMD) is a well-recognized and potentially vision-threatening complication of cataract surgery. Detached Descemet membrane causes accumulation of fluid in the pre-Descemet space and stromal edema, which leads to loss of vision. DMD should be suspected when there is localized or diffuse corneal edema or haziness that persists for over two weeks with a decrease in visual acuity. If the cornea is relatively clear, the presence of DMD can be easily detected by slit-lamp biomicroscopy, but in the presence of severe corneal edema its diagnosis on slit lamp becomes difficult and anterior segment optical coherence tomography (AS-OCT) remains the best imaging tool to diagnose DMD in such cases It was found to be 2.6% for extracapsular cataract extraction (ECCE) and 0.5% for phacoemulsification. Jain et al have reported an incidence of 0.81% in over 40000 cataract surgeries [(1).] Successful reattachment of Descemet membrane has been observed with the intracameral use of air, sulfur hexafluoride (SF6), and perfluoropropane (C3F8).[(2)]

Most are small, peripheral detachments at the site of corneal incisions and are clinically insignificant, resolving without further intervention. Only 0.5% are large and involve the central cornea[(3)] and up to 8% of these subsequently require a corneal transplant to regain corneal clarity[(4)]

MATERIALS AND METHODS

This was a retrospective review of cases with DMD following cataract surgery who presented to a tertiary eye hospital in Sankara Eye Hospital, Kanpur, India during the period from 1st January 2024 to 30 November 2024. These patients had undergone either intracameral air or C3F8 injections for DMD reattachment

Medical records were reviewed, and data collection included demographic data, eye operated, pre-existing corneal pathology, grade of cataract, type of cataract surgery, site of DMD, visual acuity, duration between descemetopexy and cataract surgery, slit lamp examination findings, and anterior segment optical coherence tomography (AS-OCT) records.

Inclusion Criteria:

All the patients, who have undergone cataract surgery either MSICS or phacoemulsification during the study period and have had DMD as an intraoperative complication during the cataract surgery, were included in the present study. All the consecutive patients fulfilling the inclusion criteria during the study period were included in the study.

Exclusion Criteria:

Traumatic DMDs, patients with pre-existing corneal pathologies and DMDs, which resulted after other intraocular surgeries, were excluded from the study

RESULTS

The present study included 28 eyes of 28 patients. All the characteristics of study patients with DMD as an intraoperative complication during cataract surgery are shown in [Table 1]. The male: female ratio of study patients was 5:9. The mean age of the patients in the present study was 64.12±5.12 years (range 50-79 years). Out of 28 eyes, 15 (52%) were right and 13 (48%) were left eyes in the present study.

Out of these 28 patients, 24 patients underwent MSICS and 4 patients underwent Phacoemulsification. 17 patients underwent descemetopexy. The Baseline Best corrected Visual Acuity before intervention were as follows - 5 patients had VA of <1/60 to PL, PR*, 7 patients with VA of <3/60 to 1/60, 5 patients had VA of <6/60 to 3/60.

Post DMD intervention the VA significantly improved. 6 patients regained VA of <6/18 to 6/60, 7 patients improved to 6/12 to 6/9 and 4 patients improved to 6/6 to 6/9 at 1 week follow up

Table -1

Characteristics	Parameters	Number of patients, n (%)
Sex	Male	10 (35%)
	Female	18 (64%)
Age (in years)	50-59	8 (28%)
	60-69	13 (46%)
	70-79	7 (25%)

Table - 2

Height (in microns)	Extent	Length (in mm)
<100 (8)	Central 06	<1 (06)
100-300 (17)	Paracentral 11	1-2 (11)
>300 (03)	Periphery 10	>2 (11)

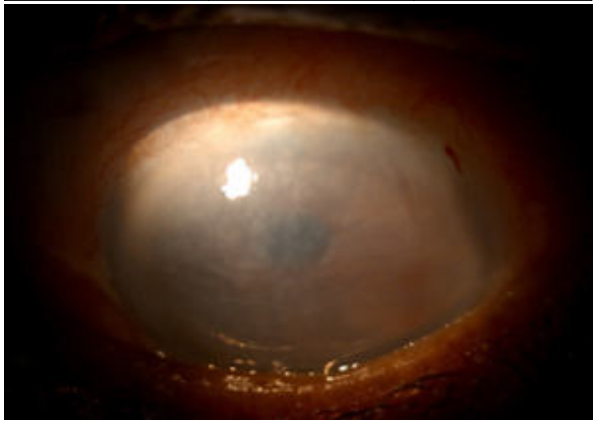

Figure 1 Slit lamp photography of patient showing diffuse corneal edema

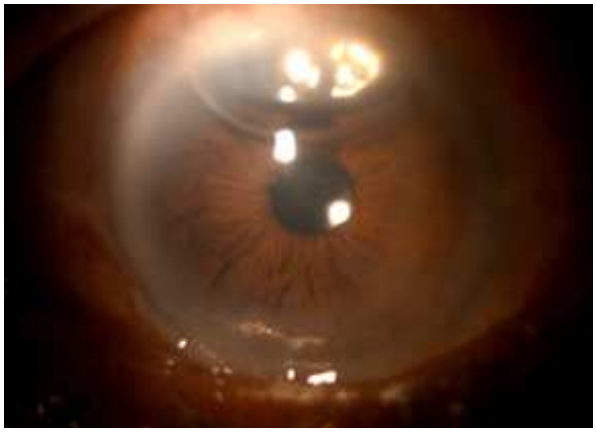

Figure -2 Slit Lamp Photography Of Same Patient After Air Descemetopexy (POD1)

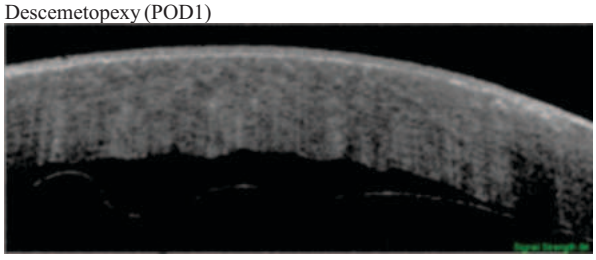

Figure -3 AS – OCT picture of the patient showing DMD

In HELP algorithm, the DMD parameters were In HELP algorithm, the DMD parameters were taken from AS-OCT. Based on the acronym, "HELP" components are height, extent, length and relation to pupil (with or without pupillary involvement) [Table - 2]. These tables depict the parameters of DMD using HELP algorithm and the type of intervention done in these cases utilizing AS-OCT-based HELP algorithm, respectively. 11 cases (39%) were managed medically and 17 cases (60%) were managed surgically. Moutsouris K et al., in their study suggested that, AS-OCT added diagnostic information in 36% of eyes, in whom examination was not possible by using slit-lamp biomicroscopy alone.[8]

In the present study, DMD cases with length less than 1 mm and height <100 microns in any zone, DMD cases with length 1-2 mm and height 100-300 µm in zone 2 and 3 and DMD cases with length >2mm and height >300 µm long in zone 3 included 11 cases, in whom medical management was considered.

Whereas, in DMD cases with length 1-2 mm and height of 100- 300 microns in zone 1 (for both with and without pupillary axis involvement, DMD >2 mm and height >300 µm long in zone 1 and 2) - included 17 cases, where surgical management was considered.

DISCUSSION-

Descemet's membrane detachment (DMD) is a common complication after intraocular surgery especially after cataract surgery. The management of Descemet detachment depends on various factors, such as the location and area of the detachment, the degree of anteroposterior separation from the posterior stroma.

Kumar DA and Agarwal A, in their study proposed an AS-OCT based HELP algorithm, for deciding the treatment plan [5]. This HELP algorithm has been utilized in the present study, to decide the plan of management in all the study patients.

We studied the role of AS-OCT in early diagnosis of patients with Descemet's membrane detachment and the role of only 100% air initially in various types of DMD. Other gases such as C3F8 was used only if descemet membrane failed to reattach by air in first attempt. We prefer to use 100% air over other long-standing gases (SF6 or C3F8) for many reasons. Air is absorbed in the shortest time (1 to 3 days). It has a lower risk for endothelial toxicity than the gases. C3F8 might lead to complications to complications like endothelial dysfunction as it's toxic to corneal endothelium, raised IOP, pupillary block glaucoma, iris ischemia due to compression of iris against the lens.

A 29-gauge needle was introduced with the bevel down to reach beneath the plane of the detached Descemet membrane, and slow injection of air was attempted to tamponade Descemet membrane. The needle was then gently withdrawn and the site of entry sealed with a surgical sponge for 1 minute to prevent the air from escaping .In all eyes, complete air fill of the anterior chamber was targeted and a supine position was maintained for 15 to 20 minutes. After 15 to 20 minutes, partial, controlled release of air was performed in all eyes to maintain an air fill of approximately 80 percent of the anterior chamber. One drop of tropicamide and phenylephrine was instilled in most cases to prevent pupillary block in the immediate postoperative period.

Surgical intervention was considered for 17 patients in the present study. It included intracameral injection of 100% sterile air in 14 study patients and 14% isoexpansile perfluoropropane (C3F8 gas) in the rest three patients. Reintervention was performed in one out of 17 patients where intracameral air was put initially during intervention but on follow-up, DMD was found to be persistent. So, reattachment was done using 14% C3F8 gas. One patient had a pupillary block on a post-operative day one, which was managed conservatively with intraocular pressure-lowering agents and cycloplegics. None of the eyes had a persistent increase in intraocular pressure. In a study conducted by Odayappan A et al., Potter J and Zalatimo N, they found that large, central detachments were unlikely to resolve with topical medical treatment and required surgical intervention[6,7]

Keratoplasty is considered as final line of management, in case of failed DM reattachments. In the present study, no case required keratoplasty.

So, we conclude our study by recommending, the use of only Air for almost every type & duration of DMD for descemetopexy, as the anatomical and visual both outcomes were found significant and isoexpansile gases such as 14% C3F8 or 20% SF6 should be used only when air descemetopexy fails to reattach, such as in cases with extensive non-planar DMDs. Post-descemetopexy complications were also high with them as compared to air, so air is a safe, easy, cheap and effective option for descemetopexy. The present study the importance of AS-OCT based HELP algorithm in the treatment of DMD

Limitations of the present study include smaller sample size, shorter follow-up period (one month), and unequal distribution of cataract cases based on the type of surgery performed

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