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Case Report

Toric Intraocular Lens Implantation in a High-Risk Challenging Eye: A Case with Successful Outcome

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Abstract

Background: A toric intraocular lens implantation in a one-eyed patient, having high corneal astigmatism, hypermetropia and eccentric pupil, can be very challenging and associated with a high risk of poor visual outcome.

Case discussion: Here we report a one-eyed patient with short anterior chamber depth and high astigmatism of -4.0dioptres, who was taken-up for phacoemulsification with toric intraocular lens implantation in the good eye. Pre and postoperative status including best-corrected visual acuity, complications and anatomical outcomes have been described. Intra-operative challenges like small pupil, short phacoprobe-to-endothelium distance and judgement of putting toric intraocular lens in the only seeing-eye posed higher surgical complexity. Post-operatively, the lens was center in-the-bag maintaining its axis, cornea was clear, adequate anterior chamber depth and visual acuity improved to 6/9 from 6/24 in the only seeing eye.

Conclusion: Thus, toric intraocular lens implantation has good functional outcome in managing one-eyed cases with other high-risk factors like shallow anterior-chamber, eccentric pupil and high astigmatism.

Introduction

Toric intraocular lenses (IOLs) were first familiarized in 1992 by Shimizu et al. The improved predictability and safety of toric IOL implantation has been recognized and is used to correct significant corneal astigmatism in cases undergoing phacoemulsification. Ideal case assortment is a precondition to certify patient satisfaction and optimal visual outcomes. The decision of toric IOL is governed by the magnitude and axis of corneal astigmatism, patient expectations, and presence of any other ocular disease. Toric IOLs are available in cylinder powers of 1.5 D to 6.0 D (1.03 D to 4.11 D at the corneal plane) and are correct preexisting regular corneal astigmatism ranging from 0.75 D to 4.75 D [1]. Poor pupillary dilatation is a relative contraindication, as it may hinder the visualization of the

alignment marks present on toric IOL. On top of that, cataract surgery in a one-eyed patient with narrow anterior chamber poses high surgical complexity and stress in the surgeon. Here, we report a one-eyed case with several high-risk factors like eccentric small pupil, narrow anterior chamber and high astigmatism, who underwent successful toric IOL implantation and resulted in successful visual outcome in the only seeing eye.

Case Discussion

A 54-year-old male patient reported with diminution of vision in right eye (OD) for last 6-months. Ocular examination revealed best corrected visual acuity (BCVA) of 6/60 in OD, normal corneal endothelial morphology and shallow anterior chamber. On dilatation, eccentric pupil with nuclear sclerosis grade III (Lens Opacity Classification System III) [2]. Fundus details were normal in OD. While the left eye (OS) had no perception to light due to primary optic atrophy.

His preoperative work-up included biometry (IOL Master V.5 Carl Zeiss Meditek) which revealed OD axial length 21.93 mm, ACD 2.40 mm, lens thickness 4.94mm, keratometry K1: 42.06 D (Diopters), 45.67 D, cylinder-4.11 D×177, IOL power +27.50 D; and pachymetry of 562 µm. Her endothelium cells (Specular Microscope SP-3000P) were 2448 in OD. Patient was planned for phacoemulsification with toric intraocular lens implantation in OD. IOL power was calculated using Barrett toric calculator.

Patient underwent phacoemulsification (Alcon InfinityR vision system) with +27.0 D toric (SE 3.75 D) IOL implantation in OD. Surgical steps included 2.2 mm clear corneal temporal incision at steeper axis, use of cohesive beneath dispersive to coat endothelium. The eccentric small pupil of 4mm posed a problem and to avoid unnecessary iris manipulation and corneal endothelium injury, intracameral phenylephrine was used to dilate the pupil. The use of iris hooks and Malyugin ring was avoided in view of shallow AC and one-eyed case. In view of short phacoprobe-to-endothelium distance, slow phacoemulsification was done using minimal adequate power to avoid corneal edema. Narrow AC made it difficult to perform intraocular manipulations and to move the instruments in and out of the eye. However, the phacoemulsification was carried out with low parameters and toric IOL was implanted in the bag. No intraoperative complications were reported. The possibility of post-operative corneal oedema, corneal decompensation, iridodialysis and chance of surgical aphakia with secondary IOL implantation in future was discussed thoroughly with the patient.

On day 1 postoperatively, patients had mild corneal oedema (OD). The IOL was well-centered with no ocular inflammation. No complications were reported in the operated eye of the patient during follow-up. The corneal oedema gradually resolved in few days with BCVA reaching 6/9. On follow-up (1 month) BCVA reported was 6/9 with refractive error of -1.0/-0.50×90 and endothelial cell count of 2330 OD with center stable toric IOL.

Discussion

Some eyes are at a high-risk of complication during cataract surgery and intervening in such 'high-risk' eyes are more likely to produce a poor visual outcome (best corrected vision less than 6/60 after surgery) [3-6]. Knowledge of recognizing eyes at greater risk and acting accordingly helps to avoid more serious long-term ocular complications. Even so, before the operation, it is important to explain to such patients about the possibility of poor visual results to make their expectations more realistic and expand postoperative follow-up.

Over and above, the stress of doing surgery in the good eye made the case challenging at every step. Starting from maintaining AC with viscoelastic, achieving optimal dilatation in small eccentric pupil with intracameral phenylephrine, slow-motion phacoemulsification and prompt decision of continuing with preplanned toric IOL implantation in the bag posed surgical complexity all the time. The risk of postoperative corneal edema, inflammation and rotation stability of toric IOL were another unpredictable challenge for the surgeon particularly when he is performing on the only seeing eye of the patient.

In our case, the decision of not using iris hooks or any other mechanical dilator was taken to avoid iris manipulation and injury to other ocular structures while going in and out of the good eye. Viscoelastic substances had a great role and support for uneventful surgery. In our case, the use of less torsional power along with careful use of dispersive as well as cohesive agents had a significant impact in reducing endothelium cell count loss during the phacoemulsification. By taking care of minimal incisional distortions, maintaining AC stability and thorough cortical clean-up, all helped in smooth cataract surgery and implantation of toric IOL in the good eye. Extreme attention was taken at every single step.

Conclusion: The surgery can be performed safely with the use of contemporary tools and suitable techniques. This case report emphasizes the thoughtful combination of extreme care as well as the skill which may result in successful phacoemulsification with toric IOL implantation in 'high-risk' challenging eyes. Hence, toric intraocular lens has good functional outcome in managing one-eyed cases with short anterior-chamber, eccentric pupil and high corneal astigmatism.

Acknowledgments

None.

Conflict of Interests

None.

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