Medical and Research Publications
International Open Access

Case Report **Journal of MAR Ophthalmology (Volume 5 Issue 6)**

Refractive Results with Refractive Lens Exchange and Piggyback Implantation to Correct High Hypermetropia

Moemen Al-Reefy MD, FRCS *[1], Ali Kamal MD, FICO [2], Faisal Al-Reefy [3]

Corresponding Author: Moemen Al-Reefy, Al Reefy Specialist Center (Kingdom of Bahrain).

Received Date: May 24, 2023

Published Date: June 01, 2023

Abstract

This case report describes about a case of bilateral high hyperopia for achieving spectacle independence with refractive lens exchange (RLE) A 22-year Female presented with diminution of vision (DOV) since Birth. On examination, unaided distance visual acuity (UDVA) was 0.05 in OU and corrected distance visual acuity (CDVA) was 0.8 with a refraction of +12.50DS/+1.00DC (DS: Dioptre sphere, DC: Dioptre cylinder) @90 degrees in oculus dexter (OD) and +12.00DS/+1.25DC @85 degrees in oculus sinister (OS). Primary diagnosis was high hyperopia. Refractive lens exchange with a monofocal intraocular lens (IOL) plus piggyback sensar 3piece IOL. The IOL power was calculated by multiple formulae and we decided to implant +47.0D in OD and +48.0D in OS calculated using personalized A-constant. At post-op day 15, no complications were noted, UDVA in OD was 0.7 and in OS was 0.8 and CDVA was 0.8 OU, corrected near visual acuity was N6 OU with a refraction of +2.00DS OU, which was stable even at 6 months follow up RLE in high hyperopia requires meticulous planning and biometry to give good results.

Introduction

Intraocular lens (IOL) implantation is a common procedure performed in ophthalmology to correct refractive errors. In recent years, the use of piggyback IOL has gained popularity in young high hypermetropic patients. RLE or intraocular surgery in patients with high hyperopia can be surgically challenging, mainly due to a shallow anterior chamber, increased risk of choroidal effusion, choroidal detachment and macular oedema.

Patient Consent Statement

The patient agreed and consented to the surgical procedure having been explained in vernacular language about the advantages and disadvantages of the surgery and the likely complications associated. Informed written consent has been taken and a copy of it has been uploaded. IRB/Ethics Committee approval was taken for this case report.

Case Report

A 22-year-old female presented with diminution of vision in oculus uterque (OU) since birth. Unaided distance visual acuity (UDVA) was 0.05 OU improving to 0.8 with refraction of +12.50 DS/+1.00 DC @90° in oculus dexter (OD) and +12.00 DS/+1.25 DC @85° in oculus sinister (OS). Intraocular pressures recorded with contact tonometry (CT) was 14 mm Hg in both the eyes. Gonioscopy revealed open angles in both eyes.

On examination, the patient had deep set eyes, orthophoria on cover test, extraocular movements were full and free and nanophthalmos (Axial length by optical biometry: IOL Master 500 [Carl Zeiss Meditec, Jena, Germany] [no financial interest] OD – 16.00 mm, OS – 16.04 mm), with a well-dilating pupil in both eyes (8 mm). Dilated fundus examination revealed hyperopic disc OU and few areas of white without pressure temporally and no treatable lesion. Corneal topography (Pentacam HR, Scirius, , Germany) revealed K1: 52.69 @158°, K2: 54.71 D @68° in OD and K1: 53.27 @8°, K2: 55.07 D @98° in OS. Anterior chamber depth was 3.08 mm OU. White to white measurement was 11.3 mm OD and 11.4 mm in OS, measured Iusing OL Master 500 [Carl Zeiss Meditec, Jena, Germany] [no financial interest] Based on these findings, the available treatment options were – (1) RLE with a Monofocal/ Trifocal/Toric IOL, (2) toric implantable Collamer lens (ICL), (3) piggyback IOL and (4) non- surgical intervention-contact lenses.

The patient had been using spectacles; her refraction was stable over past 3 years and had a history of contact lens intolerance. RLE with a monofocal IOL was planned for the patient. IOL power calculations were done using optical biometry (IOL Master 500-Carl Zeiss Meditec, Jena, Germany). Formulae used were – Barrett TK Univeral II, Haigis, Hoffer Q and SRK-T [Table 1] which gave variable refractive outcomes. The IOL power calculated by Barrett TK Universal II, Hoffer Q was more predictable in hyperopic eyes,[3] and hence, we decided to use the above formulae. The IOL power was +47.0 D in OD and +48.0 D in OS calculated using personalised A constant of 118.0. A customised foldable hydrophobic acrylic IOL was used in bag with 3 piece IOL in sulcus for each eye. OD was operated first followed by OS. The surgical area was cleaned with povidone iodine (5%) and draped. Under topical anaesthesia with 4% lignocaine drops, a 2.6 mm clear corneal triplanar upper main incision was made followed by injection of 1% intracameral lignocaine. Two side ports of 1.2 mm incision size were made at 3’0 clock and 9’0 clock. A 5 mm central, circular capsulorrhexis was made to ensure good overlap of the IOL optic. Clear lens aspiration was done with a thorough cortical clean up. The IOL was then injected into the capsular bag and other 3 piece IOL injected in sulcus, Viscoelastic removal followed by wound hydration was done. The procedure was uneventful for both

the eyes. Postoperatively, the patient was started on eyedrops Prednisolone acetate tapering doses for 4 weeks, moxifloxacin for 4 weeks. At post- operative day 15, no complications were noted and clinical photography were done. UDVA in OD was 0.7 and in OS was 0.8, UNVA was N24 in both eyes and corrected near visual acuity (NVA) was N12, with a refraction of +2.50 OU . Binocularly, the patient maintained a CDVA of 0.8 through the months' follow-up period [Table 2].

IOL calculation formulae	Righteye		Lefteye	
	IOLpower	Residual refraction	IOLpower	Residual refraction
BarrettTK UniversalII	+47.00	−0.35	+48.00	−0.45
HofferQ	+48.00	−0.34	+46.00	+0.0
Haigis	+47.50	−0.36	+48	-0.79
SRK-T	+43.50	−0.8	+41.00	+0.07

Table 1: Different formulae with IOL powers, predicted residual refraction obtained using IOL Master 700 (Carl Zeiss Meditec, Germany)

Parameters	Right eye			Left eye		
	Pre-operative	POD-15	POD-6 months	Pre-operative	POD-15	POD-6 months
Sph	+12.50	+1.50	+1.75	+12.00	+1.00	+0.75
(D)						
Cyl (D)	+1.00	+1.00	+1.25	+1.25	+0.75	+0.75
Axis	90	95	90	85	95	90
UDVA	0.05	0.7	0.7	0.05	0.8	0.8
CDVA	0.8	0.8	0.8	0.8	0.8	0.8
UNVA	N24	N18	N18	N24	N18	N18
CNVA	N12	N12	N12	N12	N12	N12
K1	52.69	52.63	52.65	53.27	53.40	53.2
K2	54.71	54.50	54.60	55.07	55.00	55.13

Sph: Sphere, Cyl: Cylinder, UDVA: Uncorrected distance visual acuity, CDVA: Corrected distance visual acuity, UNVA: Uncorrected near visual acuity, CNVA: Corrected near visual acuity, K: Keratometry, POD: Post-op day

Table 2: Pre-operative and post-operative visual acuity and refraction.

Discussion

Patient had a amblyopia with aberrations due to thick glasses effects. We couldn't implant MFIOLs for patient because of unavailability for such high powers beside the risk of inter- lenticular opacification/red rock syndrome, associated with piggyback IOLs. On retrospective analysis, the predicted refraction and IOL power calculation were inaccurate with SRK-T, and Haigis formulae and would have resulted in a hyperopic shift, whereas Barrett TK Universal II and Hoffer Q were more reliable in terms of post-operative refraction.

Conclusion

RLE needs experts hands with accuracy and be minimally invasive to treat the presence of high refractive error in the absence of cataract when other options not suitable. Intolerance to CL and shallow AC depth make it not an option to implant ICL. Patient expectations discussed and amblyopia further discussion made.