Iris Occlusion Prosthetic Contact Lens for Urrets-Zavalia syndrome

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Introduction

- Urrets-Zavalia Syndrome (UZS) is a post-surgical complication resulting in a fixed, dilated pupil.
- Persistent mydriasis results in symptoms of debilitating glare, blurred vision, photophobia, and ocular discomfort.
- A prosthetic contact lens may function as a safe and non-invasive treatment to provide a cosmetic, therapeutic, and psychological benefit to patients with UZS.

Case Report

A 40-year-old African American female was referred to our clinic for a scleral lens fitting OD and prosthetic contact lens fitting OS. She presented to the exam extremely photophobic, wearing sunglasses and a wide-brimmed hat, and reported her extreme photophobia prevented her from performing her normal daily activities. She was not using any visual correction.

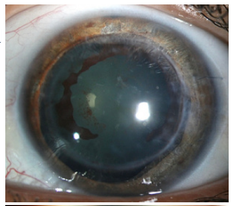

Figure 1: Slit lamp photo OS on initial examination. Note the mydriatic pupil (non-dilated) with broken PS ring.

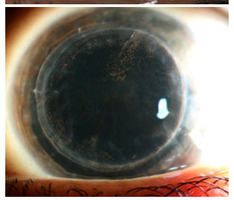

Figure 2: Slit lamp photo OS on initial examination, highlighting the cornea. Note the DSEAK under the PKP with scattered iris pigment on the posterior cornea.

Ocular History
- Keratoconus OU
- Persistent mydriasis OS secondary to UZS s/p DSEAK

Surgical History
- DSEAK OS under PKP, 2 years ago
- PKP OS, 16 years ago

Entering Uncorrected Visual Acuity:
OD: 20/60, OS: 20/125

Anterior Segment Evaluation:
OD: stromal striae, apical thinning, no scarring
OS: a fully attached DSAEK under a clear PKP with scattered iris pigment on the endothelium, and a fixed, largely dilated iris with broken posterior synechiae (PS) ring from 7 to 5 o'clock

Treatment & Management

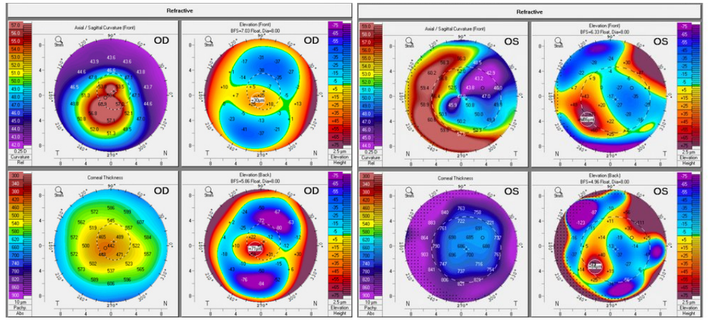

Figure 3&4: Scheimpflug tomography (Oculus Pentacam) of: OD exhibiting inferior steepening and thinning, consistent with KCN (left), and OS exhibiting irregular astigmatism and anterior & posterior floats secondary to PKP and DSEAK corneal grafts (right).

Contact Lens Fitting
OD: A CS Elite scleral lens from Valley Contax was fit to improve acuity by correcting her irregular astigmatism caused by keratoconus. Visual acuity improved to 20/20.
OS: A diagnostic prosthetic iris contact lens with a black annular ring and 4.0mm clear pupil was trialed for glare reduction. The patient reported significant improvement in her light sensitivity. However, due to her irregular corneal shape from her corneal graft, the standard contact lens (8.6 BC, 14.5 Dia) was temporally decentered causing the nasal edge of the lens to flare and result in a bubble. As a result, we ordered soft diagnostic lenses with larger diameters and steeper curvatures to trial.

The patient prosthetic lens was designed to be color-matched to her natural iris color using the Orion BioColors Fitting Set. Once we established the lens parameters that resulted in a good and comfortable fit, we ordered a lens with her printed design layers. An over-refraction was completed to optimize her acuity, which improved to 20/30.

Figure 5: Prosthetic contact lens fitting process by stacking trial lenses to color-match the patient's natural iris color.

Figure 6: Patient wearing her final scleral lens OD and prosthetic lens OS.

Final Contact Lenses:

Eye	Lens Design	Base Curve	Diameter	Rx	Other Parmeters
OD	Custom Stable Elite	7.85	15.8	+3.75 DS	toric peripheral curves
OS	BioColors Prosthetic	8.2	15.0	-4.00 DS	iris size 12.25, pupil size 3.3 clear design layers: U2, limbal ring, 55X (pecan), CB2

Outcomes:
The patient reported significant relief of her symptoms and was very pleased with her vision and the improved cosmetic appearance of her eye while wearing the final prosthetic contact lens.

Visual Acuity with Final Contacts:
OD: 20/20, OS: 20/30 OS

Discussion

UZS is a postoperative complication consisting of a fixed, dilated pupil associated with iris atrophy and occasionally secondary glaucoma. It has been reported following full-thickness and partial-thickness corneal transplants, goniotomy, laser iridoplasty, pharmacological mydriasis, and after implantation of phakic intraocular lenses. It is thought that the iris is compressed against the lens when large amounts of air or gas injected during intraocular surgeries, leading to ischemia and atrophy of the iris. Phakic patients with ocular hypertension undergoing these surgeries are at increased risk of UZS. The fixed pupil does not usually resolve with pilocarpine.

Although UZS is uncommon, the symptoms experienced can cause significant limitations to activities of daily life for our patients. Eye care providers should be familiar with UZS and non-surgical strategies to manage the condition. Iris occlusion lenses with varying pupil diameters are available by many laboratories, and can be solid colors, computer-generated designs or hand-painted. Lenses can and should be customized to better achieve a successful fit on these patients with irregular post-graft corneas in some cases of UZS. Ultilizing the pinhole effect, a prosthetic lens with a small pupil size may improve vision without additional correction. A prosthetic contact lens is a safe treatment option that fulfills a functional and cosmetic need for patient's with pupillary abnormalities.

Clinical Pearls

- When color-matching for a prosthetic contact lens, bring the patient outside of the exam room and near a window to ensure a more natural color match.
- To save chair time when designing a custom soft lens, order multiple trial lenses with different parameters at one time.

References

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