# Fitting strategy and case examples of prosthetic contact lenses for irregular astigmatism, iris coloboma and zavalia syndrome

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## Introduction:

Patients present with zavalia syndrome or iris coloboma following keratoplasty or corneal trauma are challenging cases for the contact lens fitter. The main clinical symptoms are photophobia and low visual acuity with spectacles. Poor aesthetics due to lack of the iris is also a major concern fot the patients. In some cases strabismus is present, due to low acuity occurring for a long time, contributing in the gradual eye deviation. The direction to solve one or more of these issues is prosthetic lenses with enhanced optical zone thickness incorporating spherocylindrical correction. The prosthetic part of the lens, incorporating an opaque substrate, eliminates photophobia and restore aesthetics. The enhanced optical zone thickness of the lens, minimizes or eliminates irregular astigmatism often present in post keratoplasty cases, which is responsible for low quality visual outcomes. The spherocylindrical component target elevated visual acuity. In cases where strabismus is present, strabismus correcting surgery is planned following the contact lens fitting.

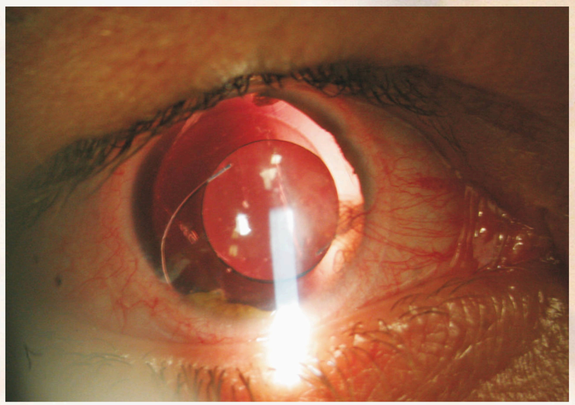


Figure 1. Case 3 Post trauma, displaced IOL, retroilluminated

## Purpose:

To describe the basic fitting principles and show relative case examples, in cases that combine irregular astigmatism (due to trauma or penetrating keratoplasty) and pupil mydriasis or coloboma. Hydrogel hand painted prosthetic lenses with thicker optical zone that incorporate toric correction is the solution of choice to offer increased visual acuity, elimination of photophobia and improved cosmesis when fitted and manufactured properly.

## Method:

The initial fitting is described in order to decide the possibility of correcting these cases with thicker hydrogel hand painted lenses. Furthermore the issues that contribute to the success of each case(Corneal topography, aberrometry, refraction and endothelial evaluation). Three cases are described, suffered from low visual acuity, photofobia and poor cosmesis.

**The basic evaluation of every case consists of:**

- ✓ Uncorrected visual acuity
- ✓ Best corrected spectacle visual acuity
- ✓ Topography
- ✓ Wavefront aberrometry
- ✓ Large pinhole (3 mm diameter) visual acuity
- ✓ Endothelial cell count (in cases of post keratoplasty)

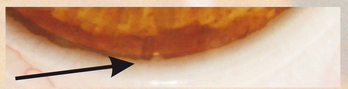


Figure 2. Toric lens marking position to be recorded for correct cylinder correction

**Fitting strategy followed:**

1. Tear film evaluation (BUT, NIBUT, tear meniscus, tear thread)
2. Trial lens fitting (Plano power Delta Conus with back toric design)
3. Sphero-cylindrical overefraction and VA measurement
4. Large pinhole sphero-cylindrical overefraction and VA measurement
5. Record of possible lens rotation
6. Digital photography of both eyes (colour balance band)
7. Iris and mesopic pupil diameter measurement (eyeart's gauge)

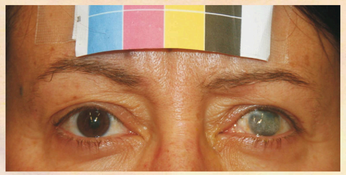


Figure 3. Sample colour band for precise aesthetic matching

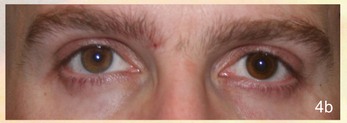
**Contact lens design and manufacture characteristics:**

- ✓ Material of choice is Filcon I 1 and II 1
- ✓ Enhanced contact lens optic zone thickness 0.20 to 0.30 mm
- ✓ Back toric design of Delta Conus
- ✓ Thin edge design 0.06 mm
- ✓ White opaque substrate
- ✓ Hand painted iris according to the photo
- ✓ Colour balance using the appropriate colour band

## Results:

Basic steps and principles were employed to fit the eyes with irregular topography. Using modern contact lens designs for post transplant and irregular astigmatism, corneal physiology is not compromised. These hand painted lenses with the appropriate technique restored normal visual function of these patients.

**Case 1**
Male PS age 33
LE Penetrating keratoplasty 2005, zavalia syndrome present.
Main subjective symptoms: Low quality vision and photophobia

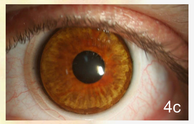




Figure 4.
Case 1
a) Without lens
b) With the lens fitted
c) Close up of contact lens

Spectacle Rx -8.00 -4.25 x 60 VA 0.40

Contact lens fitted:
Delta conus – access prosthetic
8,50/-7.25 -3.30 x 60/ 14,50 VA 0.80

**Case 2**
Male MA age 34
RE Penetrating keratoplasty (2007), IOL, zavalia syndrome present
Main subjective symptoms: intense photophobia

Figure 5.
Case 2 without the contact lens

UVA 0.05
Spectacle Rx : Non executable

Contact lens fitted:
Delta conus – access prosthetic
8,50/-2.00 -8.00 x 45/ 14,50 VA 0.80

**Case 3**
Male SG age 32
RE Post corneal trauma aniridia (2000), displaced IOL, strabismus.
Main subjective symptoms: low visual acuity, intense photophobia.



Figure 6.
Case 3
a) Without the contact lens
b) With the contact lens fitted

VA fc 3 metre

Contact lens fitted:
Delta conus – access prosthetic
8,50/+3.12 -3.60 x 80/ 14,50 VA 0.80

## Conclusions:

All cases present abnormally increased pupil diameter or aniridia and irregular astigmatism, can be successfully fitted with hand painted lenses, that combine the advantages of the design and correction of lenses used for keratoconus, post transplant, irregular astigmatism and the cosmesis of the prosthetic lenses.

## Acknowledgments:

These cases has been accomplished with the valuable help of S. Gkamarlias, production manager at eyeart laboratories, Thessaloniki, Greece

## For further information:

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