

# Revealed astigmatism versus residual astigmatism after multifocal toric IOL implant

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## Background & Objectives

Patient with mild corneal scarring and multifocal toric IOL (TIOI) was unhappy with vision after cataract surgery. To investigate possible causes and find proper solutions, a rigid gas permeable (RGP) and soft toric contact lens (CL) were both trialed. This case demonstrates the difference between “residual astigmatism” and the “revealed astigmatism” of a TIOI + RGP.

- Residual astigmatism = astigmatic refractive error after IOL implant
- Revealed astigmatism = astigmatic refractive error equal to the cylindrical power of an IOL implant, induced by neutralizing corneal astigmatism
- Front surface toric RGP = spherical back surface RGP with cylindrical power on the front surface of the lens
- Importance of expectations and lifestyle considerations for surgical planning

## Pre-operative evaluation

- 65 YOF presents for cataract eval
- POHx:
  - nuclear sclerosis OU
  - soft multifocal CL wear OS only (dominant eye OS), failed monovision CL

	OD	OS
Visual Acuity	(sc) 20/70 and J3	cc 20/50 and J2
Manifest Refraction	+0.50-2.25x105	+1.25-1.25x085

### Slit Lamp and Fundus Exam

#### External Exam

	Right	Left
External	Normal	Normal

#### Slit Lamp Exam

	Right	Left
Lids/Lashes	s/p blepharoplasty UL	s/p blepharoplasty UL
Conjunctiva/Sclera	Normal	Normal
Cornea	faint round ant stromal scar 10:00, shagreen , +FR, no staining, no guttae, no VS	faint round ant stromal scar 10:00, shagreen , no staining, tr guttae central, no VS
Anterior Chamber	Normal	Normal
Iris	Normal, dilates >7mm	Normal, dilates >7mm
Lens	2+ NS	2+ NS, 1+ CS
Vitreous	Posterior vitreous detachment	Posterior vitreous detachment

#### Fundus Exam

	Right	Left
Disc	Normal	Normal
C/D Ratio	0.35	0.4
Macula	Normal	RPE mottling temporal to fovea
Vessels	Normal	Normal
Periphery	Normal	Normal

- Patient sent to retina specialist for eval prior to cataract surgery and was cleared for multifocal toric IOL

## Cataract surgery

- Pt underwent cataract extraction with MFTIOL OD, then OS
- MFTIOL OS: DFT415 (=1.55 DC), +23.00D, 24 degree meridian, aim +0.45D
- Pt reported good uncorrected vision at POD1 and POW1 OS
  - POD1: UCVA 20/50-2
  - POW1: 20/150, BCVA 20/50
  - POM1: BCVA 20/50; pt reports worse and fluctuating vision OS. MRx: -0.75 - 1.50 x 045

## Post-operative care and CL fitting

- Due to anterior stromal scars, RGP over-refraction was performed. BCVA was 20/25-3 with ORx of:

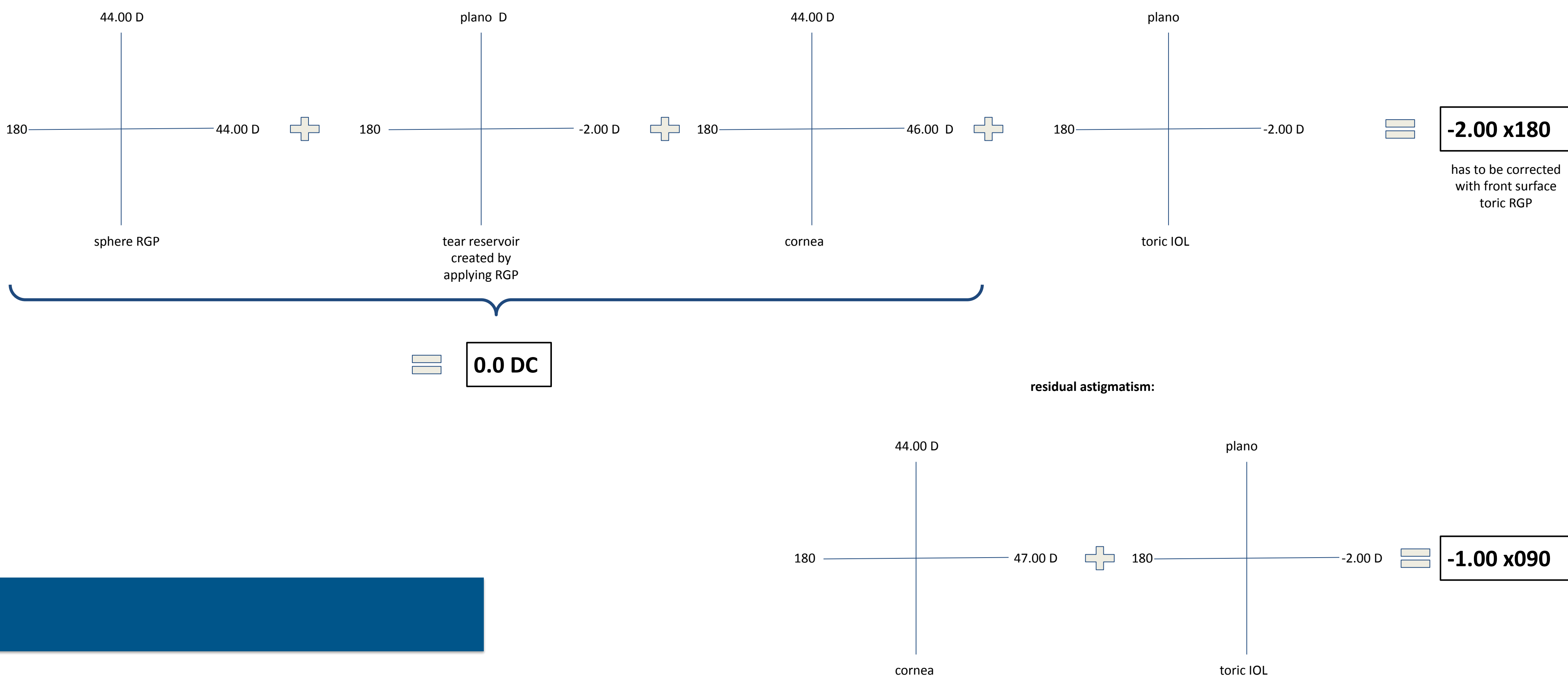
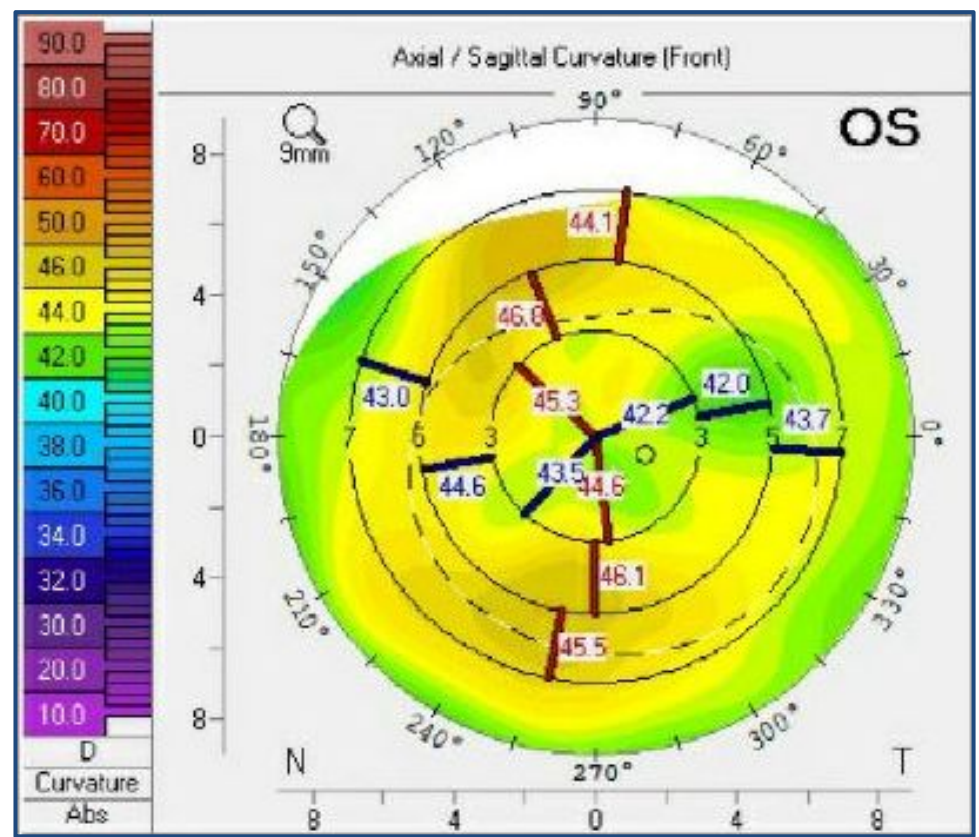
Can you guess the RGP ORx?

(pl-1.50x025)

- Pt elected to proceed with RGP fit.
- Ordered CL : Boston ES / 7.9 bc / 9.1 dia / pl -1.50 x025
  - 20/25-2, adequate fit, lens dispensed
- Next f/u: pt reported fluctuating vision
  - VA 20/50+1
  - CL fit: inferiorly decentered
  - ORx +0.75-1.25x045, VA 20/25+1
- A soft toric CL was instead trialed: Biofinity Toric 8.7 bc / 14.5 dia / -0.50 -1.25 x030:
  - good fit, no rotation, 20/25+1 and J7, no ORx
- The patient wanted to try multifocal CL in order to enhance her near vision. A soft toric multifocal, comfilcon A / 8.7 bc / 14.5 dia / -0.50-1.25x030 ADD+2.00D was ordered

- Next f/u: pt reported improved comfort, but wanted more intermediate vision,
  - VAcc 20/30-2 and J2.
  - CL well centered, adequate movement, and no rotation.
  - ORx = +0.75, VA 20/20-2 and J2 with subjective improvement in computer vision

- Finalized CL OS: comfilcon A / 8.7 BC / 14.5 DIA / +0.75 -1.25 x030 ADD +2.00D



## References

1. Hasegawa, Yumi, et al. "Type of Residual Astigmatism and Uncorrected Visual Acuity in Pseudophakic Eyes." *Nature News*, Nature Publishing Group, 24 Jan. 2022, <https://www.nature.com/articles/s41598-022-05311-x>.
2. Jeremy Z. Kieval, MD. "Residual Astigmatism after IOL Implantation." *Review of Ophthalmology*, 6 July 2015, <https://www.reviewofophthalmology.com/article/residual-astigmatism--after-iol-implantation>.



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