

Background

Aniseikonia is a condition resulting from unequal magnification, that causes a difference in image size perception between the two eyes. Post-surgical anisometropia from corneal transplant, cataract surgery, or epiretinal membrane peels is often the foremost reason for patients to have symptomatic image size differences, even after treatment with contact lenses.

Case Details

- 70 Year Old Caucasian Female**
- Referral: For aniseikonia and possible contact lens fitting**
- CC:** Right eye's image is larger, difficulty with fusion, competing images
 - She was recently diagnosed with vertical binocular diplopia possibly due to an old left 4th nerve decompensated and hypertropia in the left eye and wears PAL glasses with vertical prism
 - Right eye vision is described as is blurrier, ~20% larger, and has distortions and shadows



- Medical History:** Osteoporosis
- Allergies:** None
- Medications:** Calcium PO, Fluorometholone 0.1% 1 drop per day in both eyes to prevent transplant rejection
- Ocular History:**
 - Both Eyes:**
 - Fuchs' Dystrophy
 - Dry Eye
 - S/p DMEK
 - One episode of transplant rejection
 - S/p Cataract Surgery with PCIOL
 - S/p YAG Capsulotomy
 - Left Eye Only:**
 - Hypertropia
 - Right Eye Only:**
 - Epiretinal Membrane

Clinical Findings

- Examination findings are shown below:

Slit Lamp Exam		
	Right	Left
Lids/Lashes	Normal	Normal
Conjunctiva/Sclera	White and quiet	White and quiet
Cornea	DMEK c/c	DMEK c/c, Trace endo pigment
Anterior Chamber	Deep and quiet	Deep and quiet
Iris	Round and reactive	Round and reactive
Lens	PCIOL s/p YAG	PCIOL s/p YAG
Fundus Exam		
	Right	Left
Disc	Mild tilt, mild temporal crescent	Mild tilt, mild temporal crescent
C/D Ratio	0.3	0.45
Macula	trace ERM	Normal
Vessels	Normal	Normal
Periphery	Normal	Normal

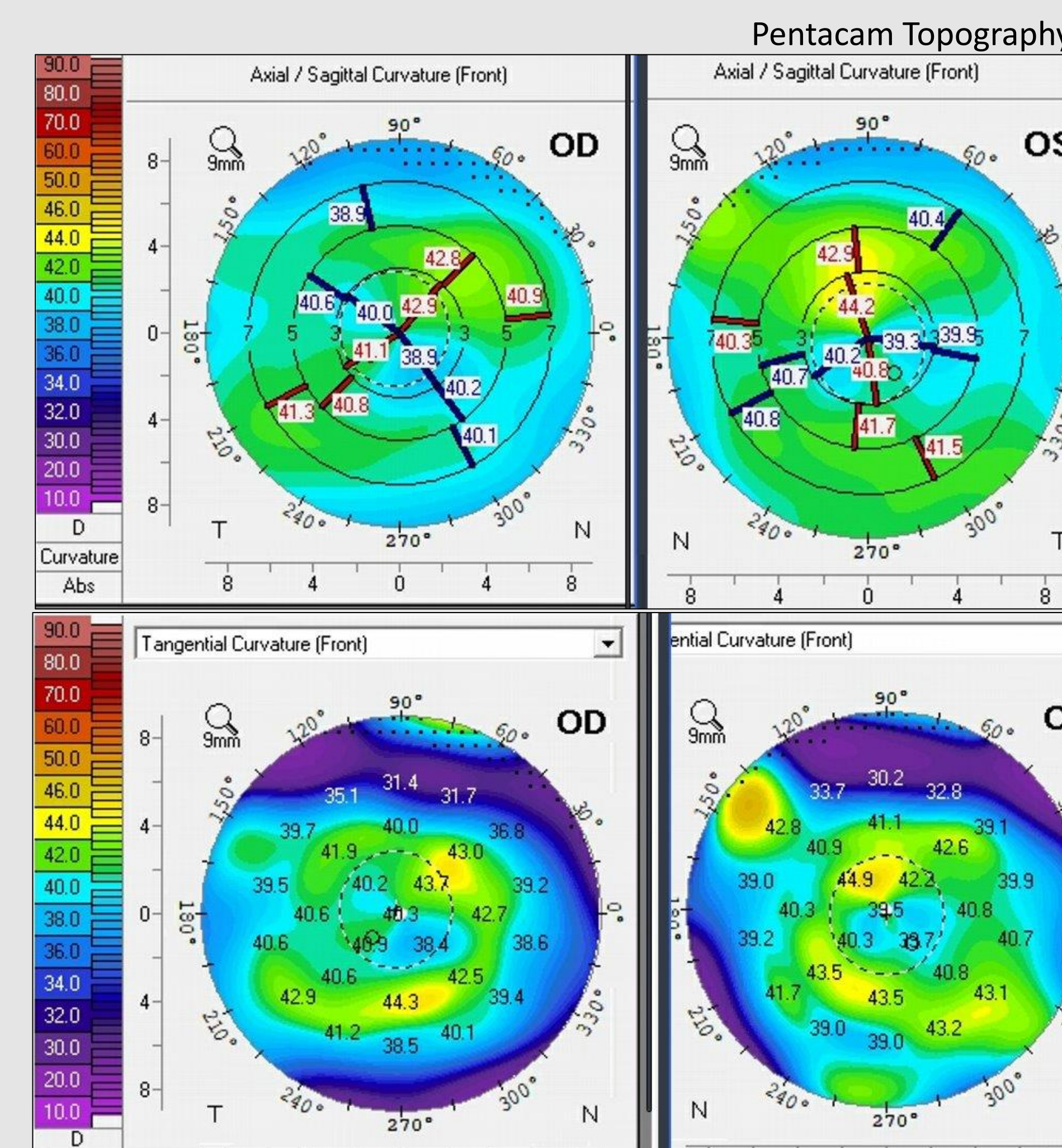
Clinical Findings

Wearing Rx				
	Sphere	Cylinder	Axis	Add
Right	-3.75	+3.75	035	+2.50
Left	-3.50	+2.00	110	+2.75

Manifest Refraction						
	Sphere	Cylinder	Axis	Dist VA	Horz Add	Vert Prism
Right	-4.00	+4.00	036	20/40-	+2.50	2 PD BI
Left	-3.50	+2.25	111	20/40	+2.75	2 PD Down

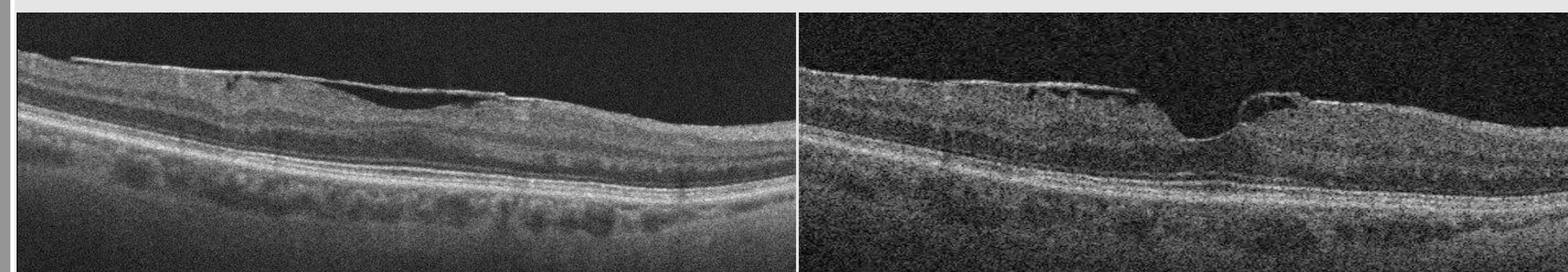
- No manifest refraction improved clarity of vision, and the patient had almost equal amounts of compound myopic astigmatism in both eyes with presbyopia, making the likely aniseikonia cause not optical, but retinal.
- Her prismatic correction also complicated the stability of her binocular vision

- Symmetry between the corneal topography also suggested the aniseikonia was likely induced from the unilateral ERM
- The goal of fitting the monovision contact lenses was to break attempts at fusion for possible improved visual comfort with the added bonus of relief from dry eye
- Although the patients VA was not improved by fitting the scleral lens, comfortable vision was achieved



Current Contact Lens Rx							
	Brand	Base Curve	Diameter	Sphere	Cylinder	Axis	Addl. Specs
Right	Europa Scleral	38.00	16.0	-0.25	+1.00	090	250 micron toric haptic, Dot
Left	Europa Scleral	39.00	16.0	+2.50	Sphere		100 micron toric haptic

- A scleral lens was chosen based on patient history of some mild irregular astigmatism in combination with her moderate to severe symptomatic dry eye



Right Eye Macula OCT

Right Eye Macula OCT

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Treatment and Management

- Testing for Aniseikonia can be done with either the pace eikonometric method and direct comparison method
- Treatments for Aniseikonia are based around symptom relief and optical options for a patient. Symptoms often include:

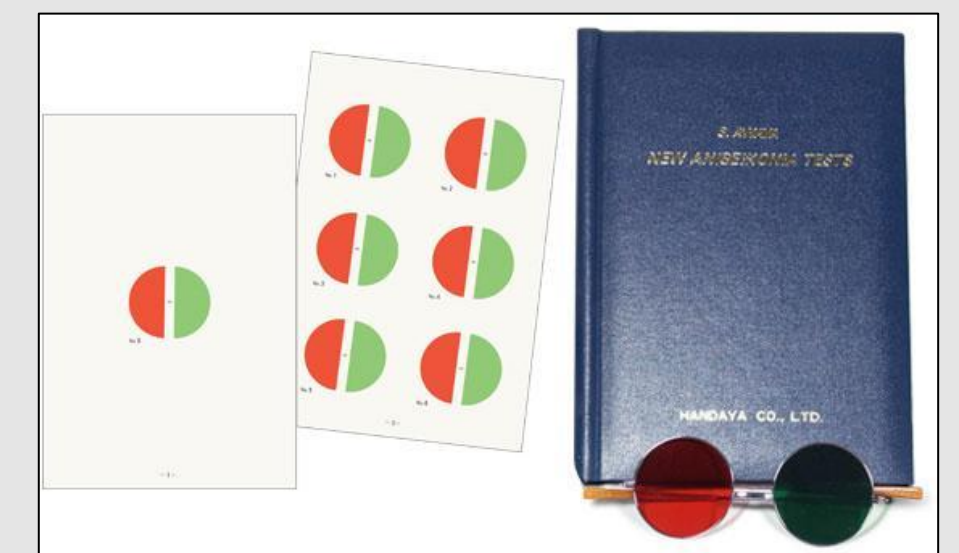


Table 1: Characteristic symptoms of aniseikonia patients

Symptom	Percentage of patients
Headaches	67%
Astenopia (fatigue, burning, tearing, ache, pain, pulling, etc)	67%
Photophobia	27%
Reading difficulty	23%
Nausea	15%
Motility (diplopia)	11%
Nervousness	11%
Vertigo and dizziness	7%
General fatigue	7%
Distorted space perception	6%



Size Lenses

- In optical aniseikonia, sometimes contacts alone can help relieve symptoms, but because retinally-induced aniseikonia is due to a compression or stretching so the image projected onto the retina stimulates either greater or less receptors, so the image appears bigger or smaller

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Optical aniseikonia	<ul style="list-style-type: none"> Inherent Acquired anisometropia of high degree
Retinal aniseikonia	<ul style="list-style-type: none"> Displacement of retinal elements towards nodal point in one eye

- After initial fitting, the patient's BCVA was similar in both eyes, but she stated her eyes felt more comfortable and her vision was sharper. She was able to adapt to the monovision and no longer had competing images and was happy to be out of reading glasses. Although encouragement of fusion is ideal, with large % of aniseikonia in this presbyope, symptomatic relief was achieved with monovision correction.

Discussion and Conclusion

While clinical measurement of aniseikonia can be difficult due to instrumentation being out of use, studies have shown that aniseikonia can affect quality of life, and that a greater than 2% difference can be considered clinically significant. Fusion and stereopsis can be affected easily, and may not even be present after a 5% difference. Retinal conditions are a less common reason, however, some studies report more than 80% of patients with ERM can have aniseikonia, most commonly macropsia. Epiretinal membranes are a common disorder in which prevalence increases with age, and it is the most frequently reported cause of retinally induced aniseikonia.

References

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