Corneal Topography and Ortho-K for the Primary Care Clinician

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Disclosures:
The Presenter and Organizers for “Corneal Topography and Orthokeratology for the Primary Care Clinician” by Mari Fujimoto, OD have no financial relationship with any company or products mentioned in this presentation.

Assessing Corneal Topography

Axial
Tangential
Elevation

Astigmatism and Corneal GP Fitting

Apical
Limbus-to-Limbus

Astigmatism and the Elevation Map

Sagittal Height of the Cornea @ 8mm chord >30um
May require a toric landing zone

Orthokeratology for the Astigmatic Cornea

Toric landing zones offer increased stability!
Orthokeratology

- Overnight GP lens wear reshapes the corneal epithelium to provide optimal foveal correction and a ring of midperipheral add
- CRT is FDA-approved for use in myopia up to 6.00D and WTR astigmatism up to 1.75D
- VST is FDA-approved for use in myopia up to -5.00D and WTR astigmatism up to 1.50D

How does Ortho-K Work?

POSITIVE PUSH FORCE
NEGATIVE PULL FORCE
NEGATIVE PULL FORCE

Initial Fitting and Clinical Assessment for Orthokeratology

1. Accurate manifest refraction
2. Consider the patient's age, refractive error, daily activities
3. Collect high quality topography scans

Case 1

16 YO Male Football Player

- CC: “I have glasses, but I cannot wear them in my helmet. A lot of our games are around 5PM and it gets a little tough to see the football.”

<table>
<thead>
<tr>
<th>Right Eye</th>
<th>Left Eye</th>
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<tbody>
<tr>
<td>20/100-2 PH 20/20</td>
<td>sc VA 20/100 PH 20/20-</td>
</tr>
<tr>
<td>-1.50-0.50x180 20/20</td>
<td>Refraction -1.50-0.25x005 20/20</td>
</tr>
<tr>
<td>42.60 / 44.50 @ 089</td>
<td>K's 42.89 / 44.69 @ 091</td>
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Composite Axial Maps OD/OS

OD Sag differential @ 8mm: 30 microns
OS Sag differential @ 8mm: 33 microns
Ortho-K follow-up
- 1-day follow-up
  - Ensure centered treatment zone and corneal health
- 1-week follow-up
- 1-month follow-up
- 3-month follow-up
- 6-month follow-up
  - Check vision, corneal health, and compare topography to baseline

Assessing Topography: The Scale

Using the Comparison Map

Right Eye 1-Week F/U

Patient notices that sometimes he has difficulty focusing at near. He also reports mild glare at nighttime.

VA: 20/20-

ORx: +1.00

Left Eye 1-Week F/U

What do these maps tell us about the fitting properties of the lens?

VA: 20/25-

ORx: +1.25

Centered Treatment
Central Island
Smiley Face

Bullseye pattern, what we want to see!
Excessive apical clearance, flatten base curve
Flat lens, riding high, tighten the alignment curve on the eye
Right Eye 3-month F/U

The patient reports that the correction lasts throughout the day and vision is comfortable!
VA: 20/15-
ORx: +0.50D

Left Eye 3-month F/U

He is excited and ready for football season!
VA: 20/15-
ORx: +0.75D

Case 2

34 YO Male Post-LASIK

• “My vision is not as sharp as I would like it and I am interested in other options besides glasses.”

• Ocular Hx: LASIK 7 years prior to examination

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<td>20/25-</td>
<td>sc VA</td>
<td>20/30-2 PH 20/20</td>
</tr>
<tr>
<td>-0.50-0.25x32</td>
<td>VA: 20/20</td>
<td>-0.75-1.25x165</td>
</tr>
<tr>
<td>40.09 / 41.06 @ 104</td>
<td>K's</td>
<td>49.11 / 41.27 @ 076</td>
</tr>
</tbody>
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Composite Axial Maps OD/OS

OD Sag differential @ 8mm: 39 microns
OS Sag differential @ 8mm: 39 microns

Reverse-Geometry Corneal GP Lens Fitting
Patient reports glare and halos that he notices in his right eye and a little bit of imbalance when he is reading.

VA: 20/20
Orx: +0.75

Decentration of the flattening effect and inferior midperipheral plus power greater than superior.

Consider the pupil size!

The patient reported good and comfortable vision in his left eye, with the effect lasting all throughout the day.

VA: 20/20+2
Orx: +0.75D

• The corneal topography can reveal valuable information!
  • Axial = Power
  • Tangential = Shape / overnight lens position
  • Elevation
  • Understanding the parameters the lab can adjust on your ortho-k lens designs may allow for more effective treatment
  • Reverse geometry lenses may allow a more optimal fit on an oblate cornea

Sources