Contact Lens Management of the Challenging Patient

Challenge: Low Myope Frustrated with CLs &/or Spectacles
Possible Options?

Some Topographical changes Associated with Silicone Hydrogel Contact Lenses May be Due to Everted Lenses
Williams, Westburge, Popowski, Popowski, Bergenske, Caroline, Smythe. Presented at AAO, Tampa, FL 12/2004

Orthokeratology
• Controlled reshaping of the cornea with reverse geometry GP CL
  – Correct myopia
  – Centration is the primary goal
  – Central applanation (3 - 4mm)

Soft Lens Orthokeratology
• Silicone Hydrogel
• Centration
• Improved initial comfort
  – Traditionally soft contact lens wearers

Subject AC -10.00 Night & Day
Patient LE -9.00 Everted Night & Day
Patient: JS  Age: 24  Male

- History:
  - Right Eye: -0.75 DS  20/20
  - Left Eye: -0.75 DS  20/20
- Interested in orthokeratology

Right Eye

Uncorrected VA 20/20

Left Eye

Uncorrected VA 20/20

MP Right Eye: -1.25 -0.25 x 015

MP Left Eye -1.00 -0.25 x 150

Patient: MP  Age: 25  Female

History: Low myopia

Right Eye: -1.25 -0.25 x 015  20/20
Left Eye: -1.00 -0.25 x 150  20/20

Patient interested in ortho-k. Fit with inverted -10.00 Alcon Night & Day Lenses
Actual Profile view
-10.00 Night & Day
Right Side In

Actual Profile View
-10.00 Night & Day
Inside Out

Summary
- Prescribing
  - Material
    - High Modulus (Night & Day)
  - Base Curve
    - Steep (Night & Day Aqua 8.4mm)
  - CL Power
    - -8.50 D to -10.00 D
  - Treatment Range
    - -0.50 D to -1.25 D
  - Off Label

Challenge: Post-Refractive Surgery Patient Where CLs are Indicated
Possible Options?

Post-Refractive Cornea
- Shape
  - Oblate = flatter center relative to periphery
- Refractive Error
  - Fluctuation
  - Irregular Astigmatism

Photokeratoscopy
With No RGP
Photokeratoscopy
With RGP

Oblate Shape
Patient: SZ  Age: 32  F

History:
Eight Incision RK to the right eye in 1994.
Significant visual symptoms at distance and near.

MR:
OD +5.50 -3.50 x 150  20/80
OS -4.50 -0.75 x 175   20/20

Right Eye
Left Eye

Ks: 39.00 @ 180 / 39.75 @ 90

Mid-peripheral Fitting Zone

Piggyback Lenses
- Improve patient comfort
- Protect the surface epithelium
- Manage peripheral RGP complications
- To provide an improved fitting surface
**Challenge: Astigmatic Patient Interested in Orthokeratology**

Possible Options?
CRT Simulated Fluorescein Pattern  
Actual On-Eye Fluorescein Pattern

Dual Axis Simulated Fluorescein Pattern  
Actual On-Eye Fluorescein Pattern

Challenge: Cleaning an RGP

Possible Options?

Enzyme/Protein Cleaners
- Boston One-Step Liquid Enzymatic
- Progent GP Protein Remover
- Progent GP Protein Remover
- Menicon
- Bausch + Lomb
The Average Eyelid

- Blinks per Minute: 12.55
- Blinks per Year: 4,397,520
- Distance Traveled per Blink: 8.5 mm
- Distance Traveled per Year: 46.5 miles

PROGENT by Menicon

In office and now at home (30 minute) cleaning and disinfecting solution.

Effective Against:
- Bacteria
- Viruses
- Acanthamoeba
- Molds
- Yeasts
- HIV

Easy To Use, Only 30 minutes

1. Clean the lenses with a GP cleaner. Rinse with saline solution. Place the lens into the lens holder of vial.
2. Twist off the ampoule and fill the chamber with Progent A and B.
3. Close the vial, after shaking gently, allow the lenses to soak for 30 minutes.
Soft Multifocal Lens Designs

Aspheric Center Near Design
Aspheric Center Distance Design
Multizonal Design

2.6 mm Pupil
4.5 mm Pupil
5.6 mm Pupil

Zones
Modifiable Zone Size & Add Power
Center Near Center Distance

Corneal Mapping Over Lens

Corneal Mapping over
Air Optix MF 8.6/14.2 -3.00 (High Add)

Corneal Mapping over
Purevision MF 8.6/14.0 -3.00 (High Add)
Corneal Mapping over Acuvue Oasys MF 8.4/14.3 -3.00 (High Add)

Corneal Mapping over Proclear MF 8.7/14.4 -3.00 (+2.50 Add)

Proclear MF 8.7/14.4 -3.00 (+2.50 Add)

Proclear MF 8.4/14.4 -3.00 (+2.50 Add)

Corneal Mapping over Proclear MF 8.4/14.4 -3.00 (+2.50 Add)

Further Investigation
Angle Lambda and Multifocals

- Fovea is decentered temporal
- Visual axis passes through the lens 1 to 9 degrees nasal to center

Study – What is Normal?

- Subjects = 18
- Enrolled based on:
  - Central K 43.00 D
  - <1.00 D corneal toricity
  - Visible Iris Diameter 11.8mm +/- 0.2mm
- 5 Commercially available multifocals chosen
- Lenses allowed to settle centration verified
- Over topography performed

Corneal Mapping over
Air Optix Aqua 8.6/14.2 -3.00 (High Add)

Corneal Mapping over
Purevision MF 8.6/14.0 -3.00 (High Add)

Corneal Mapping over
Acuvue Oasys MF 8.4/14.3 -3.00 (High Add)
Corneal Mapping over Biofinity MF 8.7/14.4 -3.00 (+2.50 Add) D

Corneal Mapping over Biofinity MF 8.7/14.4 -3.00 (+2.50 Add) N

Study

- Mismatch always temporal
- Mismatch range = 0 – 1.25mm
- Mismatch average = 0.75mm

Observation

Why do soft contact lenses frequently decenter temporally???
Line of Sight

CL Optic

Off-Set the Optics

OR

Decenter the Lens

Off-Set Multifocal Optics

Near Sighting Tasks

Eye Drop Bottle

Magazine Article

Email on Cell Phone

Vision Research Institute Study

Baseline Misalignment Observations

<table>
<thead>
<tr>
<th>Average Misalignment</th>
<th>OD (mm)</th>
<th>OS (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binocular Offset</td>
<td>-&lt;2.0</td>
<td>0.15</td>
</tr>
<tr>
<td>Binocular Offset</td>
<td>-0.15</td>
<td>0.05</td>
</tr>
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<td>0.15</td>
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</tbody>
</table>

40 – 65 years old (avg: 53.8 years)

Pupil Size (Ambient Light)

avg: 3.78 mm (OD)
3.85 mm (OS)

Visible Iris Diameter

avg: 11.41 mm (OD)
11.47 mm (OS)
Conclusions

• Statistically and clinically significant difference for 1.0 mm offset designed lenses for all near viewing tasks

• Distance viewing was similar regardless of lens pair worn

• 19 of 20 subjects preferred offset

• Subject Feedback:
  • There are no overlapping letters
  • There is less of a 3D effect
  • The double letters are gone
  • I don’t see a halo around the letters anymore