5th International Congress of Wavefront
Sensing & Optimized Refractive Corrections
February 21-23, 2004 – Whistler, Canada
Wavefront guided Re LASEK with Wavelight Concept 500

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• conventional re surgery is often very successful

• visual problems especially in ambient light, (glare or halos)

• higher order aberrations after laser surgery
Reduction of aberrations higher order with wavefront guided ablation?
• 20 patients

• 6 female, 14 male

• age 21 to 46 (MW 31.06; SD 7.63)

• primary surgery (141 to 463 days before the re-treatment, MW 278, SD 107)

• Laser (primary surgery): Technolas 117
Re Surgery

- 9.0 mm trephine; 9.5 mm alcohol cone (Geuder™)
- Cammellin technique (20% EtOH, 30 sec)
- Wavelight Concept 500 (0.95 mm)
- bandage contact lens: Pure Vision (Bausch und Lomb)
Examinations

- subjective and objective refraction
- pupil size
- corneal topography (ALLEGRO Topolyzer)
- Wavefront analysis (7.0 mm, ALLEGRO Analyzer)
- Pelli Robson chart
- Mesoptometer
Pre op refraction

<table>
<thead>
<tr>
<th></th>
<th>mean</th>
<th>Standard deviation</th>
<th>range</th>
</tr>
</thead>
<tbody>
<tr>
<td>preop first OP SE</td>
<td>-6.53 D</td>
<td>± 1.62 D</td>
<td>-4.25 to -8.25 D</td>
</tr>
<tr>
<td>preop astigmatism</td>
<td>-0.80 D</td>
<td>± 0.68 D</td>
<td>0 to -1.75 D</td>
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<tr>
<td>pre second OP SE</td>
<td>-1.28 D</td>
<td>± 0.57 D</td>
<td>-0.38 to -2.0 D</td>
</tr>
<tr>
<td>pre second OP astigmatism</td>
<td>-0.42 D</td>
<td>± 0.25 D</td>
<td>0 to -0.75 D</td>
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LASEK
Laser subepitheliale keratomileusis
Universitätsaugenklinik Regensburg
Aberrations higher order

* 0.72 0.47 0.33 0.25 0.60 0.34 0.10 0.10

pre Op          post Op

ho RMS  RMS 3  RMS 4  RMS 5
Aberrations higher order

![Graph showing aberrations pre and post operation with specific values for different orders and a starred value of 0.57 for Z_4^0.](image-url)
Mesoptometer / Pelli Robson Chart

Mesoptometer

without glare

with glare

Pelli Robson

*
Patient: KM - 31J - OD
OP 12.03.02 (-4.25/0/0)
Re OP 21.02.03 (-0.75/-0.25/65°)
(+0.5/0/0)
UVCA 20/15
MS – 22J – OD
OP 01.06.02 (-7.75/-0.75/160°)
Re OP 03.03.03 (-0.5/-0.25/147°)
(0.25/-0.25/80°)
UCVA 20/15
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<tr>
<td>n = 20</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>post OP SE</td>
<td>0.25 D</td>
<td>± 0.36 D</td>
<td>0.75 to -0.25 D</td>
</tr>
<tr>
<td>post OP astigmatism</td>
<td>-0.23 D</td>
<td>± 0.26 D</td>
<td>0 to -0.5 D</td>
</tr>
</tbody>
</table>
Predictability

Achieved [D]

20 eyes

overcorrected

undercorrected

Attempted delta SR equiv. [D]
Defocus

Percent

Defocus

45% 85% 100%
75% 100% 100%
80% 100% 100%

<=0.5D <=1D <=2D

month (eyes)

1 m (20)
3 m (20)
6 m (20)
Efficacy

20/15 or better: 20%
20/20: 50%
20/25: 30%
20/30: 30%
20/40: 5%

Month (eyes): 1 m (20), 3 m (20), 6 m (20)
pre OP BSCVA vs. postOP UCVA

- 20/15 or better: 20%
- 20/20: 85%
- 20/25: 100%
- 20/30: 100%

Month (eyes): 6 m (20) vs. preBCVA (20)
Stability

The graph shows the relationship between stability and depth (D). The stability values range from -2.00 to 1.50, with a horizontal axis representing stability and a vertical axis representing depth. The graph includes significant points labeled with numbers, such as 0.57, 0.20, and 0.25. The depth values range from 0 to 6 meters, indicated on the right side of the graph.
Astigmatism

Achieved [D]

Attempted Cyl [D]

20 eyes

overcorrected

undercorrected
Conclusion

• reduction of higher order aberrations are possible
• good safety, stability and efficacy
• important: reliable measurements
Thank you
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