Advanced Techniques with MICS

Robert J. Weinstock, MD
The Eye Institute of West Florida

Financial disclosure

- Consultant
  - Alcon
  - Bausch & Lomb
  - Wavetec
  - Truevision

Why MICS?

- Infection control
- Corneal Nerve Damage/ Dry Eye
- Surgical induced Astigmatism (SIA)
- Complication avoidance
  - Chamber stability
  - Vitreous impacts
  - IFIS/ iris prolapse
  - less BSS
  - less trauma
  - fast recovery

MICS Advantages

- The trend in cataract surgery is toward smaller incisions
- Biaxial/Bimanual microincision cataract surgery (B-MICS) allows surgery through incisions \( \leq 2.0 \text{ mm} \)
  - Must learn new technique\(^1\)
- Coaxial MICS (C-MICS)
  - Use current phaco technique
  - Reduce surgically induced astigmatism (SIA)\(^2-4\)
  - Increase wound sealability\(^5\)
  - Reduce endothelial cell loss\(^6\)
The Complete MICS Platform

- **Stellaris® Vision Enhancement**
  System designed to support 1.8-mm MICS, whether bimanual/biaxial (B-MICS) or coaxial (C-MICS)

- **STORZ® Ophthalmic MICS Instruments**

- **Amvisc® PLUS OVD**

- **Akreos® MICS IOL** can be inserted through a 1.8 mm incision

**Stellaris® MICS™ Performance**

- **Field observation study**
  - 46 Investigators
  - 13 countries across North America, Asia, and Europe
  - 1488 phaco cases reported
  - 385 (26.0%) Standard coaxial phaco
  - 811 (54.8%) Coaxial MICS (C-MICS)
  - 284 (19.2%) Bimanual (Biaxial) MICS (B-MICS)
  - 8 gave no response to question on surgical method
  - Range of techniques, including divide-and-conquer, chop, and phaco flip

**Wound Burn**

- **Wound Burns Reported FDA MAUDE Database**

**MICS™ Fluidics**

*Rated Good to Excellent*
Efficiency

<table>
<thead>
<tr>
<th></th>
<th>Effective Phaco Time (EPT)</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coaxial MICS™</td>
<td>4.6 sec</td>
<td>12.5%</td>
</tr>
<tr>
<td>Biaxial MICS™</td>
<td>2.8 sec</td>
<td>10.8%</td>
</tr>
<tr>
<td>Coaxial Small Incision Surgery (SICS)</td>
<td>5.1 sec</td>
<td>13.0%</td>
</tr>
</tbody>
</table>

Significantly Less Postoperative Central Corneal Edema with MICS vs SICS

Significantly Less Surgically Induced Astigmatism with 1.8 mm C-MICS vs SICS

Significantly Less SIA with Total B-MICS™ Procedure
Comparison of 1.8 mm and 2.8 mm phaco incisions

- OCT anterior segment imaging

- Using Stellaris® system, no significant difference between 1.8 mm and 2.8 mm groups in endothelial misalignment or defects in Descemet’s membrane

Greater Wound Strength with MICS™

European Clinical Study

Mean Post-implantation Incision Size

Greater Wound Strength with MICS™ Enlarged to 2.65 mm

- Mean Incision Size (mm)
**Induced Astigmatism**

Mean Small Incision Cataract Surgery (SICS) induced astigmatism is 0.30 D (Range 0.00-0.50)

M. Rajan, MD

**Comparison of SICS (2.8 mm) vs MICS (1.8 mm)**

P<0.001 at 1 day, 1 week and 1 month postoperative

Surgically Induced Astigmatism (D)

**Visual Acuity**

- Stable visual acuity over time

**Refractive Stability**

T. Amzallag, MD

T. Kohnen, MD
**MICS™ Summary**

- MICS (1.8 mm) even with incision enlargement *optimized* phaco outcomes over conventional SICS
  - Less intraoperative fluid flow
  - Less postoperative corneal edema
  - Quieter eyes
  - More rapid visual recovery
  - Less surgically induced astigmatism
  - Improved wound integrity

**Reduced Insertion Size**

- Water content (26%) provides high degree of flexibility
- Hydrophilic acrylic component (HEMA) for high compression during insertion
  - Allows creation of microincision IOL
- Hydrophobic acrylic component (PMMA) for recovery of initial shape without damage

**Technical Specifications Akreos® MICS™**

- **Material**
  - 26% hydrophilic acrylic, with UV blocker
  - Refractive index 1.458 (hydrated)
- **Optic**
  - Aspheric anterior and posterior surfaces
  - 360° posterior barrier edge
- **Diopter Range**
  - 0.0 to 9.0 D in 1.0 D increments
  - 10.0 to 30.0 D in 0.5 D increments
- **Optic Body X Total length**
  - 6.2 x 11.0 mm from 0 to 15 D
  - 6.0 x 10.7 mm from 15.5 to 22 D
  - 5.6 x 10.5 mm from 22.5 to 30 D
- **Haptics**
  - One-piece, angulated
- **Power Calculation**
  - A-constant Zeiss IOL Master: 118.9
  - ACD: 5.49
  - Surgeon Factor: 1.73

*A-Constant, ACD and Surgeon Factor are estimates only. It is recommended that each surgeon develop his or her own values.

**The Akreos® Acrylic Material**

- Material safety has been demonstrated in more than 3 million implants for over 10 years
- Pure PMMA-HEMA copolymer
- Refractive index of 1.46
Lens Sized for Best Fit in Bag

- Capsular bags are not all the same size
- Akreos MICS IOL has 3 lengths for best fit

<table>
<thead>
<tr>
<th></th>
<th>Myopic</th>
<th>Emmetropic</th>
<th>Hyperopic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial Length</td>
<td>-26</td>
<td>-24 to -25</td>
<td>-23</td>
</tr>
<tr>
<td>Capsular Bag AVG=10.37mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lens Diameter</td>
<td>11.0 mm</td>
<td>10.7 mm</td>
<td>10.5 mm</td>
</tr>
<tr>
<td>Dioptric Range</td>
<td>0 to 15 D</td>
<td>15.5 to 22 D</td>
<td>22.5 to 30 D</td>
</tr>
</tbody>
</table>

Optic Design

- Akreos MICS lens optic is suitable for 1.8 mm incision without compromising quality of vision
  - 30% thinner than Akreos AO lens
  - Aspheric aberration-free optic
  - Moderate refractive index
  - 360 degree posterior square-edge design

Haptic Design

- Force of capsular bag contraction causes the two parts of the conforming tip to move closer together and the angled absorption zone to bend

Akreos® MICS™ Insertion Device

- Lens is placed in center of the loading chamber.
- Cartridge is closed and locked
- Haptics are oriented upwards
- Cartridge is placed in the injector.
What you need for CMICS

1. Modern phaco machine: Infinity, Stellaris
2. 1.8-2.2mm keratome
3. Microcapsulorhexis forceps
4. CMICS phaco needle sleeve
5. CMICS I and A handpiece sleeve

What you need for BMICS

1. Modern phaco machine: Infinity, Stellaris
2. For 20G, 1.2-1.4mm trapedoidal keratome
3. For 19G, 1.4-1.6mm trapezoidal keratome
4. Microcapsulorhexis Forceps
5. 19 or 20G non-flared 30 degree bevel phaco
6. 19G or 20G irrigating handpiece and tip
7. 19g or 20G aspiration handpiece and tip

MST Duet Bi- Manual System
Videos