Intraoperative Gonioscopy: A Key to Angle Surgery

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# Phaco vs. MIGS

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<th>PHACO</th>
<th>MIGS</th>
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<td><strong>Viewing</strong></td>
<td>Full corneal access</td>
<td>Limited AC depth; increased work distance</td>
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<td><strong>Intraocular Surgery</strong></td>
<td>Posterior to dilated iris sphincter</td>
<td>Anterior to iris plane; risk to cornea/iris in narrow space</td>
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<td><strong>Corneal Stimulation</strong></td>
<td>Limited to keratome/side-port incisions</td>
<td>Stimulation sub-epithelial nerve endings entire surface</td>
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<td><strong>Instrument Handling</strong></td>
<td>Bimanual intraocular</td>
<td>Simultaneous extra and intra-ocular manipulation; one handed surgery</td>
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## Essential Perioperative Steps For Successful Angle Surgery

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Step 1: Office Based Gonioscopy

- **Why?** For surgical planning
- [www.gonioscopy.org](http://www.gonioscopy.org) [Dr. Alward]

1. Gonioscopy documented < 50% charts reviewed of patients undergoing ocular medical therapy

2. Medicare Claims Data: 50% open angle glaucoma patients undergoing surgery had a claim for Pre-Op gonioscopy.

Step 2: Angle Anatomy

- Scleral Spur – Surgical Landmark that separates:
  - Anteriorly: Canal Based surgery via the Trabecular Meshwork
  - Posteriorly: Suprachoroid based surgery via the ciliary body face
Step 3: Anesthesia

- Topical? Involuntary eye movements
- Peri- or Retrobulbar block? Akinesia
- For novice surgeons, not unreasonable to begin with a block. Why?
  1. Builds surgical confidence
  2. Avoids potential intra-ocular complications
Step 4: Head/Microscope Rotation

- Temporal approach to reach nasal angle
- Rotate head 30-40 degrees away nasally
- Rotate microscope temporally same amount
- **End-point:** Align coaxial light along iris plane
- Increase magnification of angle
- Increase light intensity to view structures
Step 4: Head/Microscope Rotation

- Increased working distance between oculars and surgical field
- Phaco: Full access to entire cornea
- Angle surgery: viewing space confined to AC depth [2-3 mm centrally; TM space: 0.77 mm]
INCREASED WORKING DISTANCE: 8 INCHES

PRIMARY PHACO POSITION

ANGLE SURGERY POSITION
**Step 5: Goniolens Selection**

- All are a modification of Swan-Jacob Lens
- Vary in degree of corneal contact, field of view, magnification and handle length
- Handle contiguous with goniolens
- Exception: Volk Transcend Vold Goniolens:
  1. Free floating lens originates from separate handle
  2. Fixation ring for globe stability
  3. Rotation in x and z axis
Step 6: Hand Positioning

- Hold lens with non-dominant hand
- Place and rest palm on forehead or cheek based upon laterality
- Arch fingers over the nasal bridge
- Phaco: bimanual intraocular surgery
- Angle: extra/intra-ocular simultaneous manipulation – one handed surgery
Step 7: Corneal Incision

Wound Construction:

- Eccentricity
  1. Femtosecond laser incision offset a few millimeters inward from limbus. Potential for friction between overlying goniolens and instrument access via keratome incision
  2. Consider making incision manually
Step 7: Corneal Incision

Wound Construction:

- **Location**
  1. Along 3 – 9 o’clock axis
  2. Use fixation ring to rotate globe nasally and initiate incision just within limbus
  3. Serves as a pivot point/anchor during surgical manipulation of angle structures
  4. Provides equidistant surgical access to supero and inferonasal angle structures
Step 8: Soft Shell Technique

- Angle surgery: Takes place anterior to iris plane
- Phaco: Occurs posterior to dilated pupil
- **Viscodispersive OVD** – protects and coats endothelium from any damage
- A 2nd deeper layer of a **viscocohesive OVD** creates and maintains space in a confined trabecular space
- Helps protect intraocular structures during surgical manipulation
**Step 9:** Docking of Goniolens

- **Corneal Considerations:**
  1. Phaco: Keratome/Side-port incisions with **minimal surface manipulation**
  2. Angle Surgery: Cornea highly innervated structure in human body:
     a. Sub-epithelial nerve endings
     b. Limbal Plexus
     c. With docking, **entire corneal/limbal surface stimulated by goniolens**
Step 9: Docking of Goniolens

- Tetracaine drops
- Viscoelastic
- Lidocaine Jelly:
  1. Topical analgesic/patient comfort
  2. Coupling medium between cornea/lens
  3. Decreased sensation tissue manipulation
Step 10: Post-Operative Goniophotography

- Self assessment for surgeon of proper anatomic placement of micro-stents
- Builds confidence and trust with patients
- Documentation purposes
- Pre-op counseling of potential surgical candidates