Pros & Cons of Introducing Femtosecond Laser Assisted Cataract Surgery in Residency Training Programs

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Disclosures

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UT Southwestern Residency: Some Characteristics

- Largest residency program in USA—with 9 residents per year (total of 27)
- One of the largest fellowship programs—with 16 fellows each year
- Typical cataract ops/per resident as primary surgeon—200.
- Begin cataract surgery @ end of 1st or beginning of 2nd year
- Monofocal, Toric, & Multifocal IOL’s
- Manual LRI’s
- Femtosecond Assisted Cataract Surgery (FLACS) in Faculty Practice & VA with plans to add to Public Hospitals in near future
A new Category is emerging in **private pay** ophthalmic surgery

Femtosecond Laser technology will drive innovation for true **Laser Refractive Cataract Surgery is Safer & More Effective**

- Unique precision for capsulotomy and corneal incisions
- **Smaller incisions** and laser optimized wound architecture
- Improved IOL performance via **Effective Lens Positioning**
- Correction of pre-existing astigmatism at time of surgery
- A more **predictable, safe and reproducible** procedure
- Technology that will enable surgeons to deliver **better vision**
Necessary Cataract Procedures for Residents to Learn

- Manual ECCE
- Phaco with Monofocal IOL’s
- Phaco with “Premium” IOL’s (toric & presbyopic correcting)
- Femto assisted cataract surgery (FLACS) with phaco
- (ICCE)
What shoud be the order of learning?

- ECCE vs Phaco with Monofocal IOL’s---first
- Phaco(MCS) vs FLACS with Monofocal IOL’s---first
- Add to above, Refractive IOL’s
Outcomes of Manual Extracapsular Versus Phacoemulsification Cataract Extraction by Beginner Resident Surgeons

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No Financial Interests or Relationships to Disclose
Complication Rates of ECCE vs. Phaco

Results

<table>
<thead>
<tr>
<th>Complication Rate</th>
<th>Inability to place PCIOL</th>
<th>Need for Reoperation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phaco</td>
<td>ECCE</td>
<td>Phaco</td>
</tr>
<tr>
<td>2.46%</td>
<td>4.07%</td>
<td>2.33%</td>
</tr>
<tr>
<td>6 of 244</td>
<td>7 of 172</td>
<td>3 of 172</td>
</tr>
<tr>
<td>p=0.3987</td>
<td>p=0.2364</td>
<td>p=0.6455</td>
</tr>
</tbody>
</table>

- Inability to place PCIOL: ECCE 4.07%, Phaco 2.46%
- Need for Reoperation: ECCE 2.33%, Phaco 1.23%

Note: p-values indicate statistical significance.
Conclusions

• Phacoemulsification without prior ECCE experience appears at least as safe, if not safer, and more effective than manual ECCE for the beginner surgeon; therefore Phaco first.

• Guidance from experienced faculty members during initial cases may contribute to low complication rates
Adoption of Femtosecond Laser-Assisted Cataract Surgery (FLACS) In Residency
Resident Experience with FLACS vs MCS @ UIC
June 2012 - February 2013

Purpose
• To document and compare the resident experience performing cataract surgery with femtosecond laser with standard cataract surgery performed without femtosecond laser.

Date Courtesy: Jose de la Cruz, MD

Methods
• 32 eyes undergoing cataract surgery with use of the LenSx Laser
• 91 eyes undergoing cataract surgery with standard phacoemulsification techniques without use of the laser
• All cases were performed by residents and fellows with attending supervision at the University of Illinois at Chicago
• The LenSx Laser was used to create corneal incisions in 31 of 32 LenSx Laser cases, and anterior capsulotomy and lens fragmentation in all 32 LenSx Laser cases
Phaco Times Reduced with FLACS

- Residents had significantly lower phaco time and torsional time with LenSx Laser treated eyes.

Date Courtesy: Jose de la Cruz, MD
Laser Power Reduced with FLACS

- Residents experienced significantly:
  - Lower CDE
  - Less U/S power
  - Less torsional amplitude

Date Courtesy: Jose de la Cruz, MD
Resident Complication Rate: Reduced with FLACS

Posterior Capsular Tears:  
- 3/91 Manual cases  
- 0/32 LenSx Laser cases  

Thermal Effect:  
- 1/91 Manual cases  
- 0/32 LenSx Laser cases

Date Courtesy: Jose de la Cruz, MD
FLACS Summary

• FLACS has been demonstrated to lead to reduced phaco power and effective phaco time.

• FLACS lead to Decrease Cumulative Dissipated Energy (CDE) during cataract extraction.

• FLACS has been shown to lead to fewer complications in the resident teaching environment compared to manual cataract removal.
Most Difficult Steps of Cataract Surgery for Residents to Perfect

- Capsulorhexis
- Nuclear division & removal
- Consistent water tight corneal incisions

All 3 Facilitated by FLACS

Dooley & O’Brien, JCRS 32; 604-608, 2006
Manual Steps That Are Different after FLACS

- Dealing with capsular tags when exist
- Hydrodissection differences, so do not blow out posterior capsule
- Nuclear separation/division
- I & A of anterior subcapsular cortex
Advantages of FLACS for Residents & Patients

• **Safer** procedure, especially for residents & their patients

• **More effective** procedure

• Along with Premium IOL expertise, prepares them for a competitive market & for future further developments in Refractive Cataract Surgery & evolving patient expectations
Challenges Going Forward

• Cost, capital outlay & procedure
• Staffing, considering new surgical approaches
• Certification of staff & residents
• Risk Dilution of Manual Phaco skills if insufficient volume to begin with
Thank You