Femtosecond LASER ASSIST
For Complex Cataracts:
PXE and Loose Zonules

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• The first sign of a complication in cataract surgery is:
  DENIAL

Approach to the patient with a “complex cataract”

• Small pupil/synechiae
• White Cataract
• Brunescent Cataract
• Phacodenisis

Be prepared

• Prepare the patient for:
  – Longer surgery
  – A block
  – Realistic expectations
  – Review possible complications

OR preparation

• Malyughin Ring/Iris Hooks
• CTR (Morcher ®)
• Trypan blue
• Trouble kit:
  – Scissors, Needle holder, Suture, Glue (Resure)
  – Vitrectomy set up
    • MVR blade
    • Familiarity with Pars Plana Incisions

Femtosecond Lasers and Cataract Surgery

• Precision Incision
  – Capsulotomy in particular
• Astigmatism (LRI)
  “Femtosecond lasers make routine cases easier,
complex cases routine, and impossible cases possible.”
  Juan Batlle
Factors predisposing to zonular weakness

• Systemic problems
  – Marfan’s syndrome
  – Pseudoexfoliation syndrome
• Trauma

Strategies to Address Zonular Dehiscence

• Low stress capsulotomy
  – Minimize tangential and centripetal forces if possible
• Low flow phacoemulsification
  – Try to decrease turbulence
• Minimize force used to crack/divide nucleus
• Judicious use of CTR/support rings

Surgical Pearls

• Femtosecond laser allows for capsulotomy and nuclear quadrant division to be performed with minimal zonular stress
• Iris hooks (or flexible capsule retractors) are used to support the capsule throughout the procedure
• Placement of CTR stabilizes bag and may prevent late dislocation
• Lens support relies on sulcus haptic position and optic capture

Purpose

• To evaluate the utility of femtosecond laser assisted cataract surgery in complex cases
Methods

- Retrospective chart review of 17 patients
  - Mean age 58 years (range 27 to 81 years)
- LenSx femtosecond laser (Alcon) assisted complex cataract surgery performed between 2012 and 2013
- Main outcome measures were complications with the anterior capsulotomy, other surgical complications, and post-operative best corrected visual acuity

Patient Characteristics

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Cataract Type</th>
<th>Pre BCVA</th>
<th>Post BCVA</th>
<th>LenSx Procedure</th>
<th>Complication</th>
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<tbody>
<tr>
<td>1</td>
<td>51</td>
<td>Dense White</td>
<td>HM</td>
<td>20/20</td>
<td>Cap, Nuc, Wounds</td>
<td>None</td>
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<tr>
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<td>50</td>
<td>Dense White</td>
<td>LP</td>
<td>20/20</td>
<td>Cap</td>
<td>None</td>
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<tr>
<td>3</td>
<td>75</td>
<td>Dense White</td>
<td>LP</td>
<td>20/40</td>
<td>Cap</td>
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<tr>
<td>4</td>
<td>55</td>
<td>Dense White</td>
<td>HM</td>
<td>20/50</td>
<td>Cap, Wounds</td>
<td>None</td>
</tr>
<tr>
<td>5</td>
<td>53</td>
<td>Dense White, Traumatic</td>
<td>HM</td>
<td>20/70</td>
<td>Cap, Wounds</td>
<td>PC Tear, ACIOL</td>
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<tr>
<td>6</td>
<td>58</td>
<td>Soft White</td>
<td>HM</td>
<td>20/20</td>
<td>Cap, Wounds</td>
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</tr>
<tr>
<td>7</td>
<td>45</td>
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<td>20/20</td>
<td>Cap</td>
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</tr>
<tr>
<td>8</td>
<td>64</td>
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<td>HM</td>
<td>20/40</td>
<td>Cap</td>
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</tr>
<tr>
<td>9</td>
<td>62</td>
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<td>HM</td>
<td>20/150</td>
<td>Cap</td>
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<tr>
<td>10</td>
<td>27</td>
<td>Central Ant Capsular Scar</td>
<td></td>
<td>20/100</td>
<td>Cap, Wounds</td>
<td>None</td>
</tr>
</tbody>
</table>

Results

- A successful complete capsulotomy was achieved in 14 of 15 cases.
  - Suction loss occurred in one case resulting in an incomplete capsulotomy

Results

- Lens fragmentation was attempted on four cases
- A posterior capsular tear occurred during one of these cases on a brunescent lens
- Two additional cases were complicated by a posterior capsular tear.
- All patients had a better post-operative best corrected visual acuity compared with pre-operative acuity.
  - 81% of patients with sufficient follow-up achieved vision of 20/40 or better.
Conclusions

- The femtosecond laser is an effective tool for creating an anterior capsulotomy in challenging cases.
  - Especially useful in safely creating a capsulotomy in cases with zonular instability and phacodonesis

Contact Information

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