Posterior Segment Complications and Management of Retained Lens Material

Jay M. Stewart, MD

Cataract surgery is the leading cause of malpractice claims (OMIC)

Complicated CE/IOL: Choices the anterior segment surgeon can make

- Vitreous in the AC
- Management of dislocated lens fragments
- Choice of IOL: PC vs AC?
- Dislocating/falling PCIOL: watch or grab?

Goal: a “clean” anterior segment – Arbisser 2006

Vitreous in the AC

- Goal: no vitreous to the wound (= fall back)

Triamcinolone in AVX

- No randomized data
- Surgeon-dependent / training

Dislocated lens fragments: Should you chase them?

- Posterior assisted levitation / Pars plana techniques

PAL

- Por and Chee, *JCRS* 2006
- Retrospective series
- 14 patients
  - 4 intraop lens fragments or IOL
  - 10 post-op IOL dislocation
  - 25 gauge needle

PAL

- 1 pt (7%) = vitreous hemorrhage
- 1 pt (7%) = RD / final VA = CF
PAL

- AJO 2009: M. Stewart editorial
  - Chaudhary 2008: ASRS
  - 3 pts with PVR following PAL by an experienced surgeon

Dislocated lens fragments: Timing for PPV?

- Yeo et al, BJO 1999
- Macrophage counts in vitreous

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Median cell count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early (&lt; 7d)</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Late (&gt; 7d)</td>
<td>13</td>
<td>108</td>
</tr>
</tbody>
</table>

Unable to characterize nuclear vs cortical frags.

Inflammatory cells in vitreous

- Wilkinson and Green, Ophthalmo 2001
- No cells in cases done 3 days or less

Early < 3d PPV: less CME/glaucoma?

- Some evidence from small retrospective series (< 20 pts)
- Larger series don’t achieve statistical significance – mixed data
Merani et al, *AJO* 2007
Retrospective series, 223 eyes

<table>
<thead>
<tr>
<th>Days to PPV</th>
<th># cases</th>
<th># RDs</th>
<th>% RDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>38</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2-10</td>
<td>139</td>
<td>13</td>
<td>7%</td>
</tr>
<tr>
<td>11-30</td>
<td>27</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>&gt;30</td>
<td>19</td>
<td>6</td>
<td>32%</td>
</tr>
</tbody>
</table>

Colyer et al, *Retina* 2011
Retrospective series, 172 eyes

<table>
<thead>
<tr>
<th>Timing</th>
<th># cases</th>
<th># RDs</th>
<th>% RDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same Day</td>
<td>59</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td>Non-Same Day</td>
<td>113</td>
<td>2</td>
<td>1.8</td>
</tr>
</tbody>
</table>

P>0.05

Meta-analysis, 2011

- Days 0-2 vs Days 3-7
  - 3-7: more good, fewer bad VA outcomes
  - Let cornea clear first

- “except when same day vitrectomy is possible…” – delay until days 3-7

- Days 3-7 better than days 7-14


Should everyone have same or 1-day PPV?

- 0 cells
- +/- RD risk
- Maybe less glaucoma and CME

- Challenges
  - Logistics
  - Retinal surgeon willingness to operate without having met the patient
Medical therapy alone?

- Schaal and Barr, *JCRS* 2009
- Retrospective series: 42 patients
  - 3 groups: early PPV, late PPV, medical management
  - Matched by demographics and size of lens fragments

**Schaal and Barr: results**

- Early PPV vs Late PPV vs Medical only

<table>
<thead>
<tr>
<th>Measure</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision at 1 month</td>
<td>No</td>
</tr>
<tr>
<td>Vision at 1 year</td>
<td>No</td>
</tr>
<tr>
<td>IOP at 1 month</td>
<td>No</td>
</tr>
<tr>
<td>IOP at 1 year</td>
<td>No</td>
</tr>
<tr>
<td>CME</td>
<td>No</td>
</tr>
</tbody>
</table>

**Selection bias?**

IOL: sulcus or ACIOL?

- Ho et al, *AJO* 2009
- Retrospective series, 166 patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio for 20/40 or better</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of PCIOL during cataract surgery</td>
<td>3.25</td>
<td>Protective</td>
</tr>
</tbody>
</table>

**ACIOL: weak association with 20/200 or worse, but not significant**

**Randomized clinical trial: ACIOL vs sulcus PCIOL**

- Collins et al, *AJO* 2003
- VA Cooperative Cataract Study Group
- 438 patients
- Included phaco (80%) or standard ECCE (20%)
Patients

- 11,160 patients gave consent
- 581 (5.2%) had vitreous loss
- 438 had sufficient capsular support

Results

- ACIOL group: slightly higher rate of nuclear fragment in the vitreous
- PCIOL group: higher rate of retained cortex

<table>
<thead>
<tr>
<th>Outcome</th>
<th>PCIOL (n=180)</th>
<th>ACIOL (n=167)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/40 or better at 1 year</td>
<td>91%</td>
<td>79%</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Statistically significant advantage for PCIOL

Trend toward more CME with ACIOLs, but not significant

What if there is not adequate sulcus support?

- Retrospective, comparative series
  - 36 pts: primary scleral-sutured PCIOL
  - 46 pts: primary ACIOL


Patients

<table>
<thead>
<tr>
<th>Surgery type</th>
<th>ACIOL</th>
<th>Scleral-sutured PCIOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phaco</td>
<td>37%</td>
<td>58%</td>
</tr>
<tr>
<td>Standard ECCE</td>
<td>63%</td>
<td>42%</td>
</tr>
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Results

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<tr>
<th>Outcome</th>
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<th>Scleral-sutured PCIOL</th>
<th>P value</th>
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<tbody>
<tr>
<td>% 20/40 or better</td>
<td>72%</td>
<td>47%</td>
<td>0.04</td>
</tr>
</tbody>
</table>

ACIOL also significantly better VA in multivariate analysis
Follow-up almost 3 yrs in both groups


ACIOL better than scleral sutured PCIOL

- Reasons unclear
  - ? Macular phototoxicity (longer procedure)
  - ? Early CME (not evaluated)

Discussion

- AVX: no vitreous to the wound
  - “clean” anterior segment
- Capsule:
  - Adequate: sulcus PCIOL
  - Inadequate: ACIOL?
- Suture the wound
- Early referral to vitreoretinal surgeon