Better Surgery Through Chemicals
IC Prophylaxis, ISBCS, IC XYLO-PHE, OVDs & TSST.

*Preop Topical G4 Fluoroquinolones achieve cidal aqueous levels at the beginning of surgery.

**Drug Administration Tech.
Gatif- aqueous conc. at surgery onset (µg/ml).
Moxi- aqueous conc. at surgery onset (µg/ml).

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1 gtt QID x 2d</td>
<td>0.18 ± 0.23</td>
<td>0.38 ± 0.32</td>
</tr>
<tr>
<td>1 gtt QID x 2 d + Q15min x 3 pre-op (2h)</td>
<td>0.82 ± 0.31</td>
<td>2.16 ± 1.12</td>
</tr>
<tr>
<td>1 gtt qid x 4d + in wick</td>
<td>0.22 ± 0.07</td>
<td>0.88 ± 0.46</td>
</tr>
<tr>
<td>1 gtt QID x 4d + in wick = pre-op x 1</td>
<td>0.30 ± 0.21</td>
<td>0.97 ± 0.63</td>
</tr>
<tr>
<td>MIC (µg/ml) Endoph isolates</td>
<td>0.05 – 0.38</td>
<td>0.06 – 0.19</td>
</tr>
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</table>

Are other intracameral antibiotics better than cefuroxime?

- ESCRs starting a European Endophthalmitis registry.
- ESCRs trying to enforce cefuroxime use across Europe.
- Recent ISBCS study (International Society of Bilateral Cataract Surgeons) compared different regimens.
- Huge numbers are needed to prove superiority of one antibiotic over another (because of the extremely low incidence of post-operative endophthalmitis in all groups).
- Both vancomycin and moxifloxacin tended to have lower infection rates than cefuroxime.

Issues with different antibiotics

1. Vancomycin - Does not cover gram negatives (VS infections).

Commercial IC cefuroxime, Nov. 2012.

(Not approved or available in USA or Canada)

Cefuroxime (Aprokam®)
- Laboratories Théa 28/11/2012
- 50 mg anhydrous cefuroxime
- Reconstituted with 5 ml. saline.
- Contains 1mg. cefuroxime/0.1 ml.
IC moxifloxacin PFS available, Oct. 2013. (not approved or available in USA or Canada)

4 Quin PFS (prefilled syringe)
Manufacturer: Contacare Ophthalmics, Gujarat, India.
Marketer: Entod Pharmaceuticals Ltd., Mumbai, India.

0.5%, moxifloxacin (500 mcg/0.1 cc, pH 6.7, 292 mOsm/kg)
prefilled syringe: 0.5, 1.0 ml.
- 0.1 cc injection → 1.6 mg/ml in AC

Does moxifloxacin have advantages over cefuroxime and vancomycin?

1. Readily available - Vigamox®, Alcon (non-preservative)
2. Uncomplicated to dilute.
   - Dose = 150 µg/ml (0.1 cc; 0.3 cc IV)
   - Mix 3 ml Vigamox® with 7 ml BSS in 12 cc syringe (500 µg/ml)
3. Dose dependent, bactericidal, broad spectrum.

*If an infection occurs, it will likely be moxifloxacin resistant Staph., which is very sensitive to the usual endophthalmitis protocol of vancomycin and ceftazidime, while infections that occur with IC cefuroxime are often with destructive resistant bacteria, like enterococci.
4. Drug allergy very rare with moxifloxacin.

Advantages of ISBCS

1. Overcomes fear for patient who had a problem with 1 eye.
2. More improvement after 2nd eye surgery than 1st.
3. Immediate rehabilitation of visual system
4. Better planning of refractive result - no period of anisometropia
5. Fewer patient visits (traffic accident deaths).
6. Improved care by hospital staff.
7. Unusual patients (Christopher)

Dose of Intracameral moxifloxacin

<table>
<thead>
<tr>
<th>Moxifloxacin Dose</th>
<th>100 µg in 0.1 cc</th>
<th>300 µg in 0.1 cc</th>
<th>500 µg in 0.1 cc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
<td>10 µg/ml</td>
<td>30 µg/ml</td>
<td>50 µg/ml</td>
</tr>
<tr>
<td>Concentration</td>
<td>100 µg/ml</td>
<td>150 µg/ml</td>
<td>250 µg/ml</td>
</tr>
<tr>
<td>Concentration</td>
<td>1000 µg/ml</td>
<td>1500 µg/ml</td>
<td>2500 µg/ml</td>
</tr>
</tbody>
</table>

- > 10x MICmin most resistant case
- = 10x MICmin most resistant case
- = MIC of our case

*Is a drug from the above that our previous moxifloxacin dose was likely inadequate to eradicate resistant strains of Staphylococcus, despite the rapid dose dependent bactericidal effect of moxifloxacin

The 500 µg/ml (1 cc from the bottle of eye drops) has the disadvantage of a less physiologic solution for intracameral injection compared to the 300 µg/ml (0.2 cc), or 450 µg 0.1 cc, (nuclide of 0.1 cc Viganox from the bottle diluted with 0.9 cc)

Note: have therefore chosen to use 450 µg/ml as our routine, as a compromise of bactericidal efficacy and safety for the endothelium. Simple exchange of AC volumes.
**IC xylo-phe**

1. Add minim (0.3 cc) 10% phenylephrine to 5 cc BSS in 6 cc syringe
   \( (\text{diluted 17.7x}) \).
2. Add 4-5 drops of above phenylephrine solution to xylocaine (Astra 1% non-preserved insotonic xylo polyamp) on scrub tray \( (\text{diluted 0.08x}) \).
3. Inject 0.1 cc IC xylo-phe thru side port. \( (1. \) – Almost all pupils dilate to 8-9 mm in 10 seconds.
4. Inject 0.1 cc IC xylo-phe under OVD. \( (2. \) – 1 more mm of pupil dilation.

**OVDs: TSST**

*The Tri-Soft Shell Technique (TSST)* is a logical system of unification of all previous soft shell techniques to make them all easier to understand & perform.

**Ultimate Soft Shell Technique (USST)**

Pre Capsulorhexis Step

Pre IOL Implantation Step
TRISOFIELD SHELL TECHNIQUE (TSST):
Enhanced by adding BSS below the cohesive OVD

Capsulorhexis is easier when BSS is injected onto the capsule surface, after OVD injection, when using Soft Shell Technique, or any viscous cohesive OVD alone.

Tri-Soft Shell Technique (TSST)

1. Dispersive (visco) filled space (injected 1st)
2. Viscoadaptive (Healon 5) filled space (injected 2nd)
3. BSS filled space (injected 3rd)

Incision

TSST for Fuchs’ & Low ECC
1. Low flow → low turbulence (Ozil).

1. Asp flow rate ~ 15-25 cc/min.
2. Vacuum < 250 mm Hg.
3. Bottle height ~ 75 cm

2. Reinject OVDs as needed (H5): - e.g. after hydrodissection.

3. Keep phaco & I/A tips deep to ’rhexis, leave dispersive at end.

Conclusions: IC Antibiotics, ISBCS, (XYLO-PHE), TSST.

1. All studies, irrespective of background infection rate, demonstrate 80+% reduction in endophthalmitis with IC antibiotics. Moxifloxacin appears to be best @ 300 µg/0.2 cc, (diluted 3:7 with bss).
2. ISBCS is better.
3. XYLO-PHE makes surgery much easier.
4. TSST with variations, permits simpler surgery for the vast majority of cases.

Thank you
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Tri-Sofield Shell Bridge

Simple Summary: use OVDs & stretch pupil

TSST → * IFIS Soft Shell Bridge