Afternoon Session
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RETINA UPDATES

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Illinois Eye Institute
Case #1: 46 y.o. AAF

BCVA: OD 20/30
OS 20/20
“Severe” visual distortion OD x 2 weeks
Vitreo-Macular Interface

Stage 0
Stage 1
Stage 2
Stage 3
Stage 4

Small
Medium
Large

Partial thickness
Full thickness
Impending hole
PVD
ERM
VMA
VMT

Pseudohole
# OCT Classification of Macular Holes

## Full Thickness Macular Hole (FTMH) Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Stage 0</td>
<td></td>
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<td>Stage 1: Impending hole</td>
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## IVTS Classification

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<td>Small, medium or large FTMH without VMT</td>
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“Smaller” hole = < 400um

Vitreo-Macular Adhesion (VMA)

Normal foveal contour and contents/thickness
Stage 1/VMT: **50%** spontaneously resolve
Stages 2, 3, 4/small, med, large +/- VMT:
**Full Thickness**
### OCT Classification of Macular Holes

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Proportion of VMT Patients with VMA Resolution at Day 28

VMT: vitreomacular traction; VMA: vitreomacular adhesion.
Data on file, ThromboGenics.
Proportion of Patients Gaining ≥2 Lines VA
(Ocriplasmin-Treated VMT Patients with VMA Resolution at Day 28)

% patients

Combined Dataset

n = 4                         5                      12                      18                       23

Time, Post Injection

Day 7  Day 14  Day 28  Month 3  Month 6

7.1%  8.9%  21.4%  32.1%  41.1%

VA: visual acuity; VMT: vitreomacular traction; VMA: vitreomacular adhesion.
Data on file, ThromboGenics.
Proportion of Patients Gaining ≥3 Lines VA
(Ocriplasmin-Treated VMT Patients with VMA Resolution at Day 28)

Combined Dataset

VA: visual acuity; VMT: vitreomacular traction; VMA: vitreomacular adhesion.
Data on file, ThromboGenics.
Macular Hole Subgroup*

Responder Analysis

*Post-hoc analysis
Proportion of Patients with FTMH Closure (without vitrectomy)

**Combined Dataset**

- **Placebo (N = 47)**: 10.6% at Day 28, 17.0% at 6 Months
- **Ocriplasmin (N = 106)**: 40.6% at Day 28, 40.6% at 6 Months

- **p < 0.001** at Day 28
- **p = 0.004** at 6 Months

FTMH: full thickness macular hole
Data on file, ThromboGenics
Proportion of Patients with FTMH Closure by Size at Baseline (without vitrectomy)

FTMH: full thickness macular hole

Data on file, ThromboGenics
Proportion of Patients with FTMH Closure at Month 6 (without vitrectomy)

FTMH: full thickness macular hole
Data on file, ThromboGenics
Proportion of Patients Gaining ≥ 2 Lines VA
(Ocriplasmin-Treated Patients with FTMH Closure at Month 6 without Vitrectomy)

Combined Dataset

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<tr>
<th>Time, Post Injection</th>
<th>n</th>
<th>% patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 7</td>
<td>6</td>
<td>14.0%</td>
</tr>
<tr>
<td>Day 14</td>
<td>14</td>
<td>32.6%</td>
</tr>
<tr>
<td>Day 28</td>
<td>25</td>
<td>58.1%</td>
</tr>
<tr>
<td>Month 3</td>
<td>28</td>
<td>65.1%</td>
</tr>
<tr>
<td>Month 6</td>
<td>33</td>
<td>76.7%</td>
</tr>
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VA: visual acuity, FTMH: full thickness macular hole
Data on file, ThromboGenics
Proportion of Patients Gaining ≥ 3 Lines VA
(Ocriplasmin-Treated Patients with FTMH Closure at Month 6 without Vitrectomy)

Combined Dataset

Time, Post Injection

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</tr>
</thead>
<tbody>
<tr>
<td>Day 7</td>
<td>1</td>
<td>2.3%</td>
</tr>
<tr>
<td>Day 14</td>
<td>6</td>
<td>14.0%</td>
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<tr>
<td>Day 28</td>
<td>13</td>
<td>30.2%</td>
</tr>
<tr>
<td>Month 3</td>
<td>18</td>
<td>41.9%</td>
</tr>
<tr>
<td>Month 6</td>
<td>22</td>
<td>51.2%</td>
</tr>
</tbody>
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VA: visual acuity; FTMH: full thickness macular hole

Data on file, ThromboGenics
FTMH
Vitrectomy vs. Ocriplasmin

**Pros**
- High (>85%) success rate
- Known long-term side effects

**Cons**
- Surgical risks
- Face down positioning (+/-)
- Cataract formation

**Pros**
- In-office procedure
- Less $ if successful
- Avoid surgery/earlier cataract formation if successful
- No face down positioning

**Cons**
- Lower (~40%) success rate
- Surgery needed if fails
- Long term side effects not known
- Risks: tears, dyschromatopsias
  - Avoid in high risk RD patients

Avoid in high risk RD patients
Lamellar Holes

- Aborted macular hole
- “Partial thickness”
- Criteria:
  1. Irregular foveal contour
  2. Defect/break inner fovea
  3. Intra-retinal split (schisis) – can be variable
  4. Intact photoreceptors

Macular Pseudohole

- Criteria
  1. ERM
  2. No loss of tissue
  3. Heaped foveal edges
  4. Near normal foveal thickness
Stage 0/Impending Macular Hole

- FTMH one eye + VMA/VMT in fellow eye
- Fellow eye at increased risk for FTMH

OD: FTMH

20/60

OS: Impending mac hole

20/25
**Ocriplasmin (Jetrea)**

- “Symptomatic Vitreo-macular Adhesion”
- FDA Approved 2012

**MIVI-TRUST Trials**
- FTMH closure (~40%) vs. placebo (~10%)
- VMT resolution (~29%) vs. placebo (~8%)
- Smaller holes/more focal adhesion did better
- Can’t have ERM

**Recommend treatment for:**
- Symptomatic VMT or smaller macular holes (<400 um) with VMT
Back to our patient: Case #1: 46 y.o. AAF

BCVA: OD 20/30
   OS 20/20
“Severe” visual distortion OD x 2 weeks
Back to our patient…

She chose: MONITOR
Case #2: 80 y.o. AAF
Requesting Cataract Extraction

20/60

20/40
31 y.o. attorney decreased vision X 3 weeks

VA 20/50 OD
20/20 OS
Question 1

- A 31 y/o attorney complains of decreased vision OD (VA_{cc} 20/50) for 3 weeks. Examination and imaging findings are most consistent with central serous chorioretinopathy. Select the most appropriate course at this time:
  a) Inquire about steroid-containing medication use and observe
  b) Perform fluorescein-angiography-guided thermal laser photocoagulation
  c) Perform fluorescein-angiography-guided photodynamic therapy
  d) Initiate oral therapy with mefipristone
  e) Recommend lifestyle modification…consider career change
Central Serous Chorioretinopathy

• Serous macular detachment
• ‘Idiopathic’
• ♂ >> ♀ 9:1
• Possible hyperopic shift
• Risk factors: stress (‘type-A personality’)
• Exogenous/endogenous steroids
Central Serous Chorioretinopathy

• May have serous RPE detachment (PED)
• CSCR characteristic fluorescein angiography: expansile pinpoint leakage
• Smoke stack configuration in 5-10%
• Multifocal patterns
  – More common in medication-induced or systemic disease
Central Serous Chorioretinopathy

• 90% of patients exhibit spontaneous resorption of subretinal fluid and recover ‘good’ vision without treatment

  – Complaints of metamorphopsia and objective defects in contrast sensitivity are common
  – ~ 1/3 will experience recurrence

• Laser speeds recovery, does not change visual outcome
CSCR – Therapeutic Interventions

• Thermal laser photocoagulation
  – Speeds recovery..does not change visual outcome
• Photodynamic therapy with verteporfin (PDT)
• Subthreshold diode micropulse photocoagulation
• Intravitreal bevacizumab (Avastin)
• Mifepristone
CSCR – Therapeutic Interventions

- **Comparative study of patients with central serous chorioretinopathy undergoing focal laser photocoagulation or photodynamic therapy**
- Compared with focal laser, half-dose PDT may facilitate earlier resolution of macular detachment and earlier recovery of central retinal function
- However, at 3 months after treatment and thereafter, no difference in anatomical and functional recovery was noted between the two modalities of treatment
Half-dose verteporfin photodynamic therapy for acute central serous chorioretinopathy: one-year results of a randomized controlled trial

Thirty-seven (94.9%) eyes in the verteporfin group compared with 11 (57.9%) eyes in the placebo group showed absence of subretinal fluid at the macula at 12 months (P = 0.001)

CONCLUSIONS: Photodynamic therapy with half-dose verteporfin is effective in treating acute symptomatic CSC, resulting in a higher proportion of patients with absence of exudative macular detachment and better visual acuity compared with placebo.
Question 1

• A 31 y/o attorney complains of decreased vision OD (VA\textsubscript{cc} 20/50) for 3 weeks. Examination and imaging findings are most consistent with central serous chorioretinopathy. Select the most appropriate course at this time:
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Initial presentation

High Definition Images: HD 5 Line Raster
Scan Angle: 0°  Spacing: 0.25 mm  Length: 9 mm

1 month

High Definition Images: HD 5 Line Raster
Scan Angle: 0°  Spacing: 0.25 mm  Length: 6 mm
Enhanced Depth Imaging

- Increased visualization of choroidal anatomy

Normal

Outer border of RPE/Bruch’s complex

Choroid/sclera junction
Enhanced Depth Imaging CSCR

- Choroidal hyperpermeability/thickening in BOTH eyes
Central Serous Chorio-Retinopathy (CSCR)

- **Treatments**
  - Observation
  - Laser photocoagulation
  - PDT

- **Referral if:**
  - 3-4 months duration
  - Recurrent with reduced VA
  - VA other eye reduced from CSCR
  - Vocation/visual needs – willing to take risk
    - permanent scotoma
  - CNV
Case #4: 73 y.o. AAF

OD: 20/25

OS: 20/25
s/p Avastin injection x 1

20/25

20/25
Exudative AMD – polypoidal variant

- Early CNV detection/referral imperative – DON’T DELAY!
  - Typically within within 1 week or less

- Anti-VEGF
- Anti-VEGF & PIGF
- Anti-PDGF
- Anti-VEGF, PDGF, bFGF

1999
PDT
Avastin Lucentis
~$50 ~$1800
2005*
Anti-VEGF
2006
Lucentis
~$1800
2011
Eylea
~$1800
FoVista
Current Clinical Trials
Squalamine eye drops
(Additive to Anti-VEGF)

*Avastin not FDA approved
THANK YOU!!!!!
Glaucoma Update
Fall 2014 Continuing Education

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Ahmad A. Aref, MD
Assistant Professor of Ophthalmology

October 27, 2014
Chicago, IL

Disclosures – Dr. McMahon
No disclosures.

Disclosures – Dr. Aref
C: New World Medical, Inc.

L: Alcon Laboratories, Carl Zeiss Meditec

R: Akorn Pharmaceuticals

Case Presentation
• 67 year old female
• Following for 3 years with early POAG
• IOP pre-treatment mid-20s
• Achieved high teens, OD>OS
• Single medication, prostaglandin qhs OU

ONH

Visual fields
Case Presentation

- VA 20/40 OD, OS
- Mild cataract with glare complaint
- BAT ↓ VA

Management options

- Add second topical medication
- Consider laser
- Consider surgical intervention

Medical Therapy

**Advantages**

- Non-invasive
- Better perceived by patient
- Efficacious

**Disadvantages**

- Side effects
- Dosing Schedule
- Contraindications
- Drug interactions

Adjunctive Medical Therapy

- Nearly 40% of patients in Ocular Hypertension Treatment Study required ≥ 2 meds to reach target IOP

- Options
  - Beta-blockers
  - Alpha-agonists
  - Carbonic anhydrase inhibitors

Meta-analysis of the Efficacy and Safety of α-Arteriogenic Agonists, β-Arteriogenic Antagonists, and Topical Carbonic Anhydrase Inhibitors With Prostaglandin Analogs

- Results of 10 prospective, randomized, parallel or crossover clinical trials compiled and analyzed
- Primary outcome: Mean IOP reduction from baseline
- Peak, intermediate, and trough IOP lowering efficacy also compared
- Adverse events investigated
Meta-analysis of the Efficacy and Safety of α₁-Arenergic Agonists, β-Adrenergic Antagonists, and Topical Carbonic Anhydrase Inhibitors With Prostaglandin Analogs

- IOP-lowering from baseline equivalent among all adjunctive therapies (p=0.22)
- IOP lowering efficacy at intermediate and trough time points less with alpha agonists
- Greater risk of adverse events with alpha-agonists

Comparing Diurnal and Nocturnal Effects of Brinzolamide and Timolol on Intraocular Pressure in Patients Receiving Latanoprost Monotherapy

- Prospective, open-label, crossover trial of 26 patients with glaucoma or ocular hypertension who were receiving treatment with latanoprost qhs
- IOP measured q2 hrs post-randomization to timolol vs. brinzolamide
- IOPs measured in sitting and supine positions during diurnal time periods and in supine position during nocturnal time period

Comparing Diurnal and Nocturnal Effects of Brinzolamide and Timolol on Intraocular Pressure in Patients Receiving Latanoprost Monotherapy

- Post-hoc evaluation of data from prospective clinical trials comparing brimonidine and timolol
- Timolol treated subjects concurrently taking systemic β-blockers experienced less IOP-lowering effect (P<0.041)
  - 4.41±0.51 vs. 6.23±1.8 mm Hg at peak

Laser Therapy

- Argon laser trabeculoplasty described by Wise and Witter in 1979
- Both argon & selective laser trabeculoplasty act to lower IOP by enhancing aqueous outflow facility

Effect of Topical Prostaglandin Analog Use on Outcome Following Selective Laser Trabeculoplasty

- Retrospective review of 113 eyes with POAG treated with SLT
- IOP outcomes slightly better in prostaglandin users compared to non-users (P<0.02)
Which is better ALT or SLT?

- Similar efficacy<sup>1</sup>
- Similar safety profile<sup>1</sup>
- SLT repeatable<sup>2</sup>, but ALT is not<sup>3</sup>


**Microinvasive Glaucoma Surgery**

- Ab interno microincisional approach
- Minimally traumatic to target tissue
- At least modest IOP-lowering efficacy
- High safety profile
- Rapid recovery with minimal impact on quality of life


**FDA-Approved MIGS Procedures**

- Ablation of trabecular meshwork and inner wall of Schlemm’s canal
- FDA-approved in 2004
- Indications
  - All stages of glaucoma
  - Requires adequate visualization of trabecular meshwork

**Glaucoma Treatment Paradigm**

**Trabectome**

- Ablation of trabecular meshwork and inner wall of Schlemm’s canal
- FDA-approved in 2004
- Indications
  - All stages of glaucoma
  - Requires adequate visualization of trabecular meshwork
Trabectome Video

Mean IOP reduced from 20±6.3 mm Hg to 15.5±2.9 mm Hg at year with mean medicine reduction of 1.44±1.29 meds

iStent

• Titanium L-shaped stent implanted ab-interno

• Bypasses trabecular meshwork by connecting anterior chamber with Schlemm’s canal to enhance aqueous outflow

• FDA approved in 2012
  – Indicated for treatment of mild to moderate glaucoma in conjunction with cataract surgery

Postoperative Care after MIGS

• Perform gonioscopy to visualize surgical result
• Fluctuations in IOP managed accordingly
• Hyphema possible during week 1
• VA stabilizes after 1-2 weeks
• Suture remains in place

Randomized Evaluation of the Trabecular Micro-Bypass Stent with Phacoemulsification in Patients with Glaucoma and Cataract

• 1-year results:
  – 72% in treatment group vs. 50% in phaco alone group with unmedicated IOP ≤ 21 mm Hg (P < 0.001)
Postoperative Trabectome

- Topical antibiotic x1 week
- Topical corticosteroid x4 weeks
- Maintain glaucoma meds x4-6 weeks
- Pilocarpine qid x6-8 weeks
- Follow up at 1 day, 1 week, 3 weeks, 2 months

Postoperative iStent

- Topical antibiotic x1 week
- Topical corticosteroid x4 weeks
- Maintain glaucoma meds x4-6 weeks
- Follow up at 1 day, 1 week, 3 weeks, 2 months

Goal

- Achieve lower IOP with minimal risk and less significant impact to the patient.

Thank you