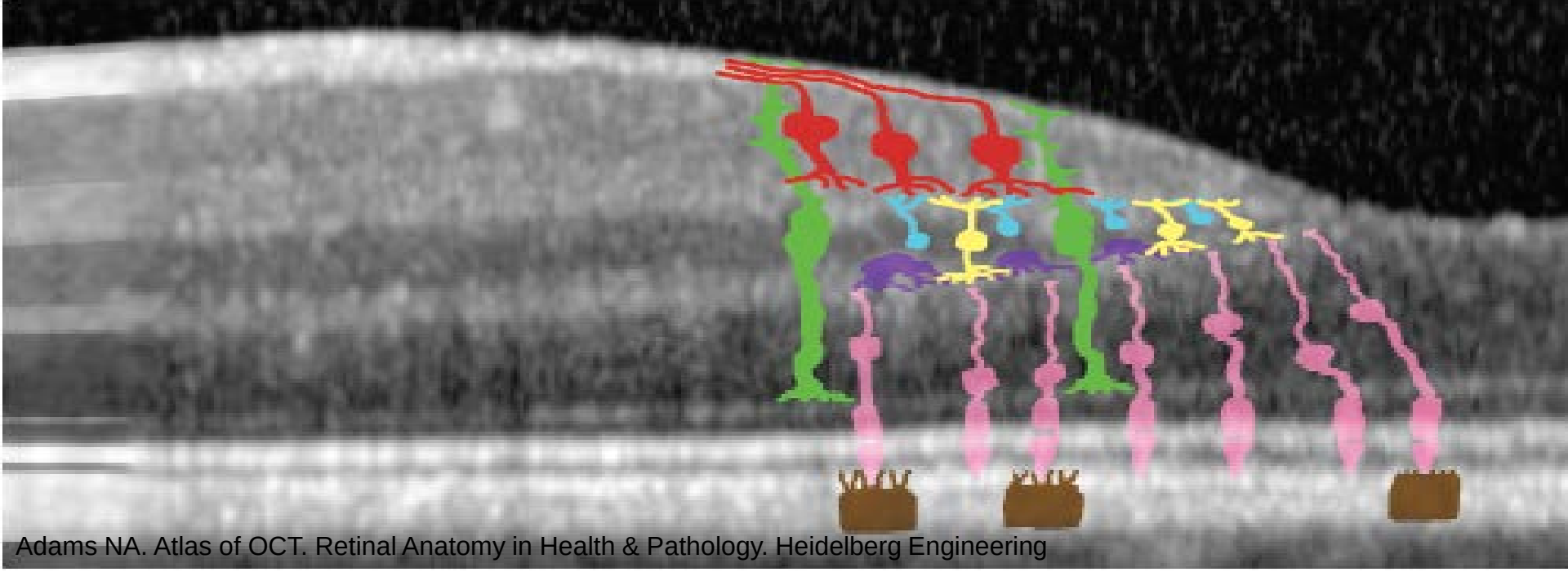
ICO

Afternoon Session

Stephanie Klemencic, OD
Yannek Leiderman, MD
Janice McMahon, OD
Ahmed Aref, MD

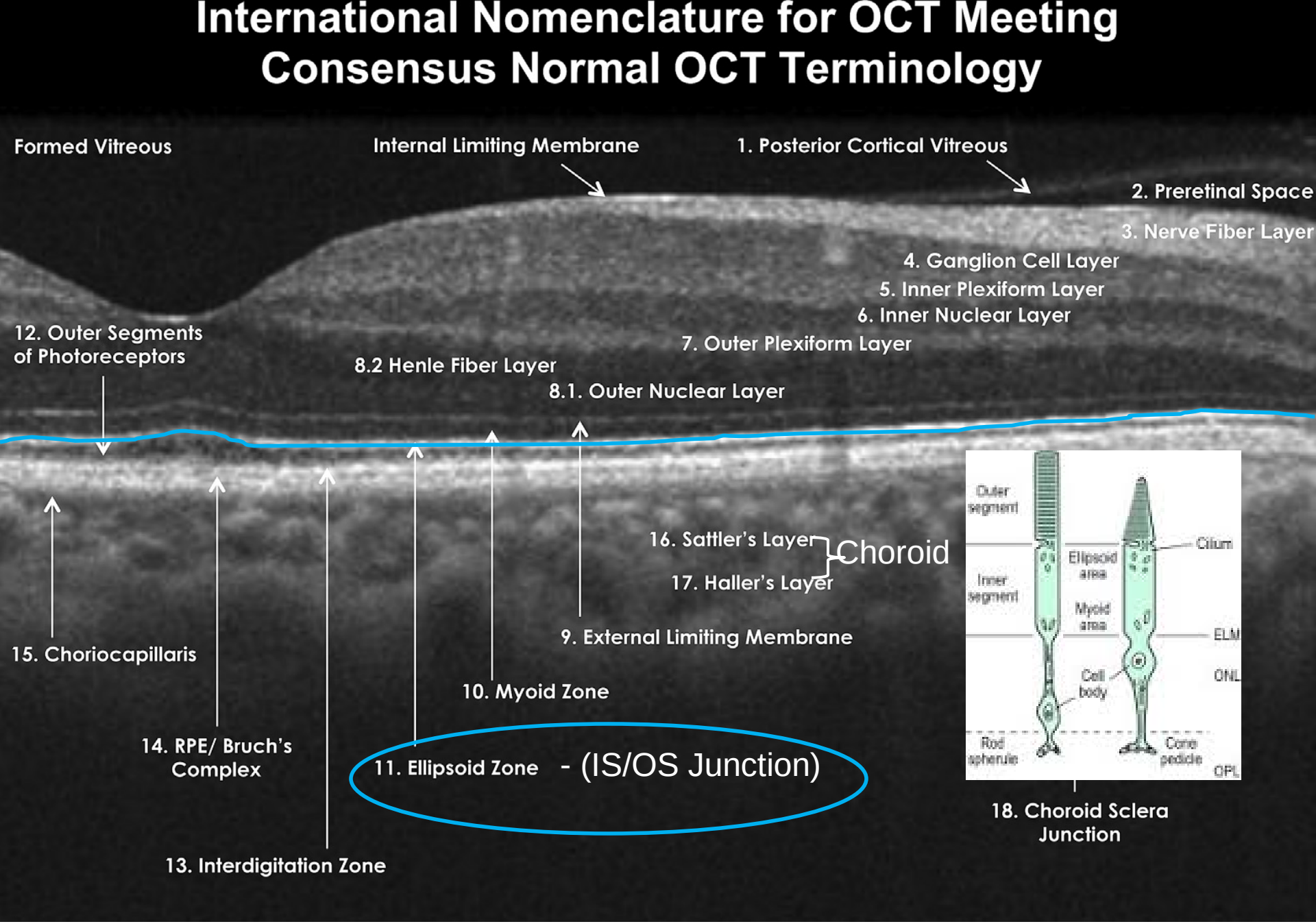

Adams NA. Atlas of OCT. Retinal Anatomy in Health & Pathology. Heidelberg Engineering

RETINA UPDATES

Yannek Leiderman, MD, PhD
University of Illinois Chicago
Illinois Eye and Ear Infirmary

Stephanie Klemencic, OD
Illinois College of Optometry
Illinois Eye Institute

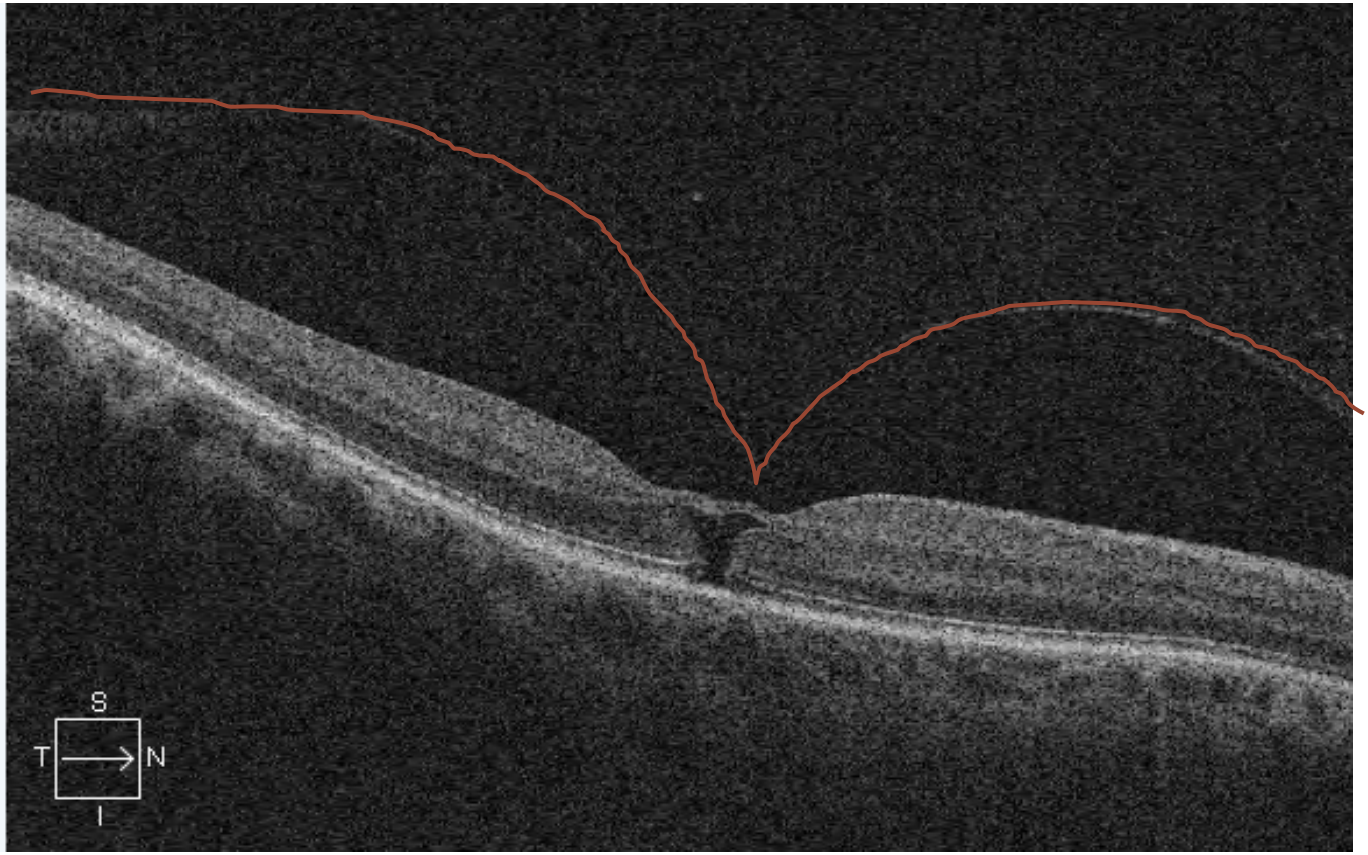
International Nomenclature for OCT Meeting
Consensus Normal OCT Terminology

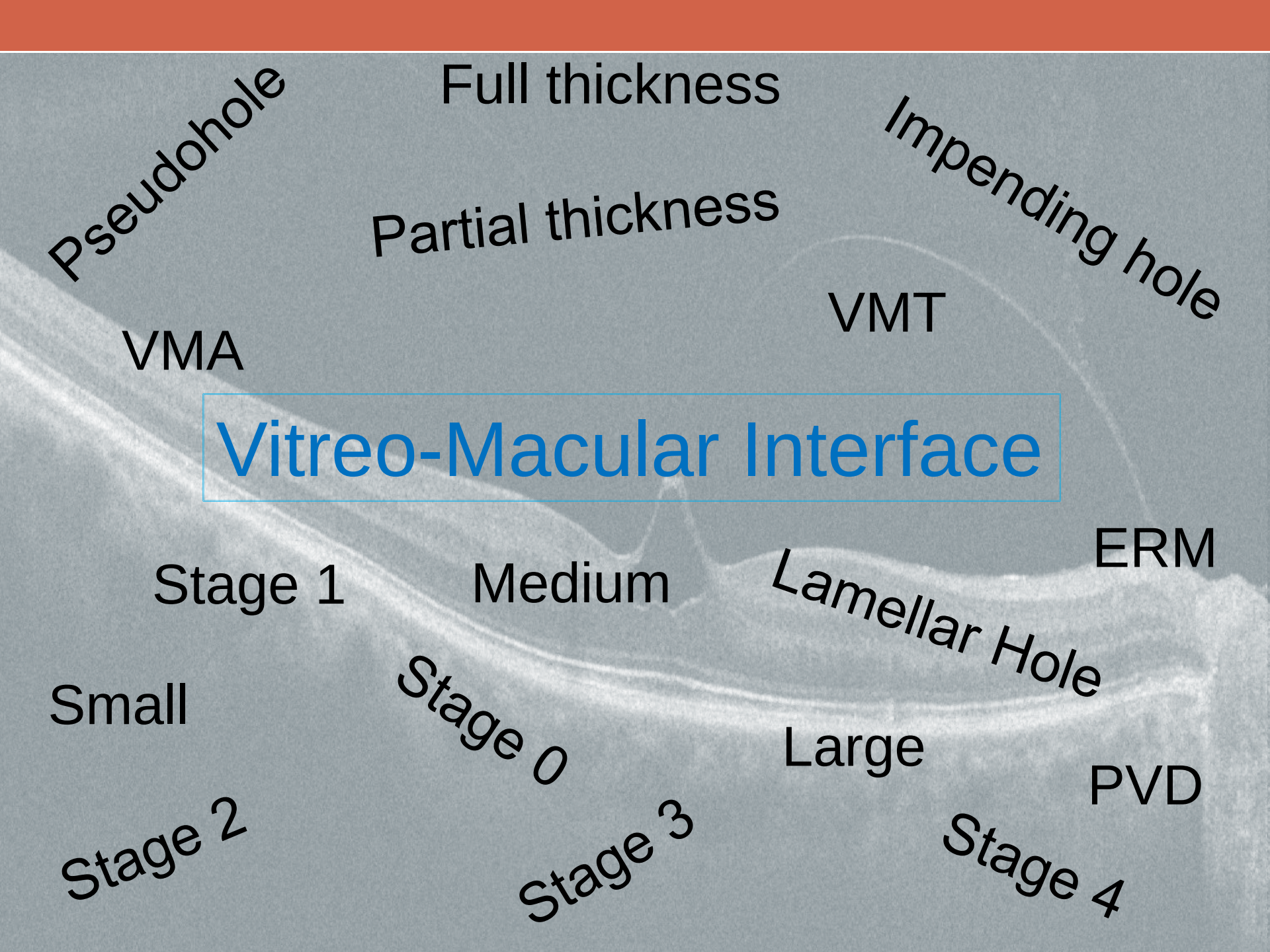


Staurenghi G, Sadda S, Chakravarthy U et al. Proposed Lexicon for Anatomic Landmarks in Normal Posterior Segment Spectral Domain Optical Coherence Tomography. The IN OCT Consensus. Ophthalmology 2014;121:1572-1578

Case #1: 46 y.o. AAF

BCVA: OD 20/30
OS 20/20
“Severe” visual distortion OD x 2 weeks




Pseudohole
Full thickness
Impending hole
Partial thickness
VMT
VMA
Vitreo-Macular Interface
ERM
Stage 1
Medium
Lamellar Hole
Small
Stage 0
Large
PVD
Stage 2
Stage 3
Stage 4

OCT Classification of Macular Holes

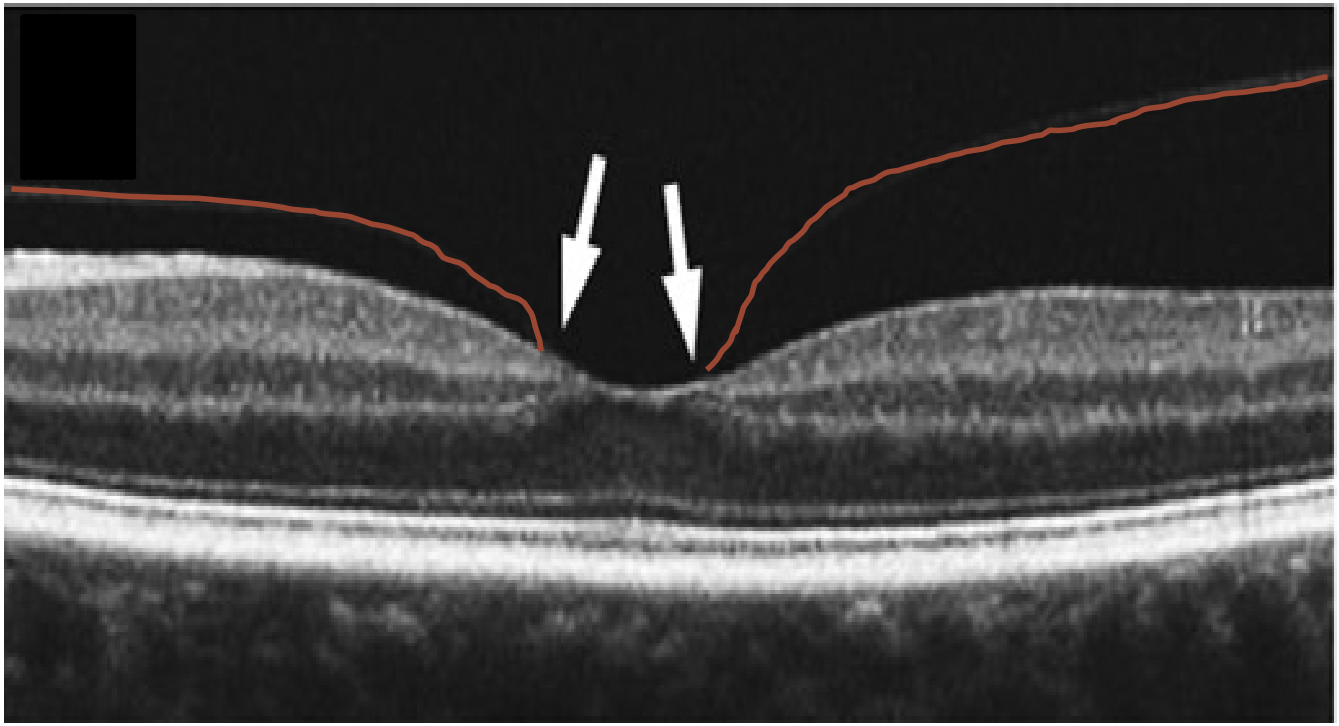
Full Thickness Macular Hole (FTMH) Stages	IVTS Classification
Stage 0	VMA
Stage 1: Impending hole	VMT
Stage 2: Small hole	Small or medium FTMH with VMT
Stage 3: Medium hole	Medium or large FTMH with VMT
Stage 4: FTMH with PVD	Small, medium or large FTMH without VMT

“Smaller” hole = < 400um

Duker JS, Kaiser PK, Binder S et al. The international vitreomacular traction study group classification of vitreomacular adhesion, traction, and macular hole. Ophthalmology 2013;120:2611-2619

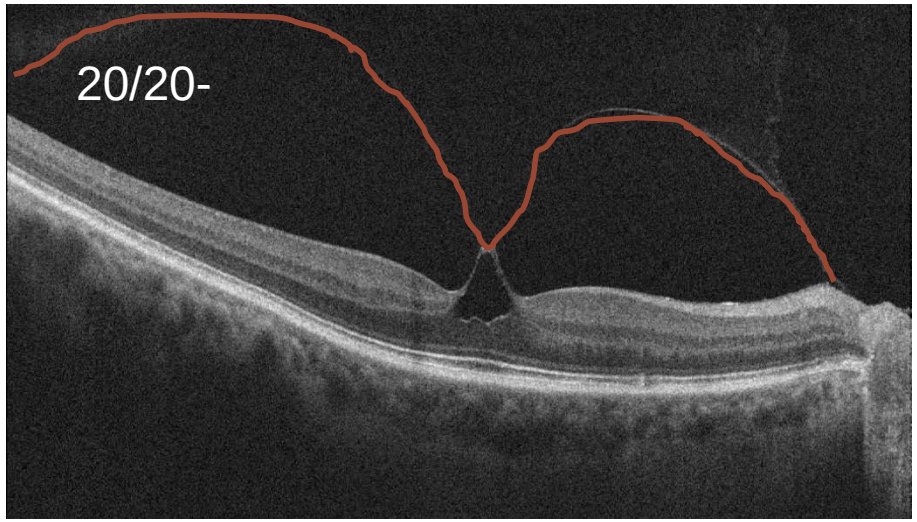
Vitreo-Macular Adhesion (VMA)

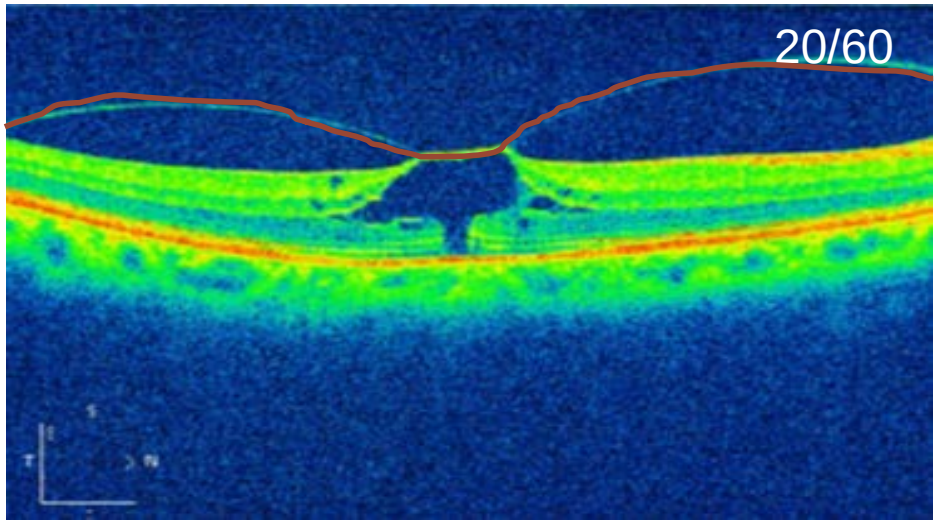
Normal foveal contour and contents/thickness

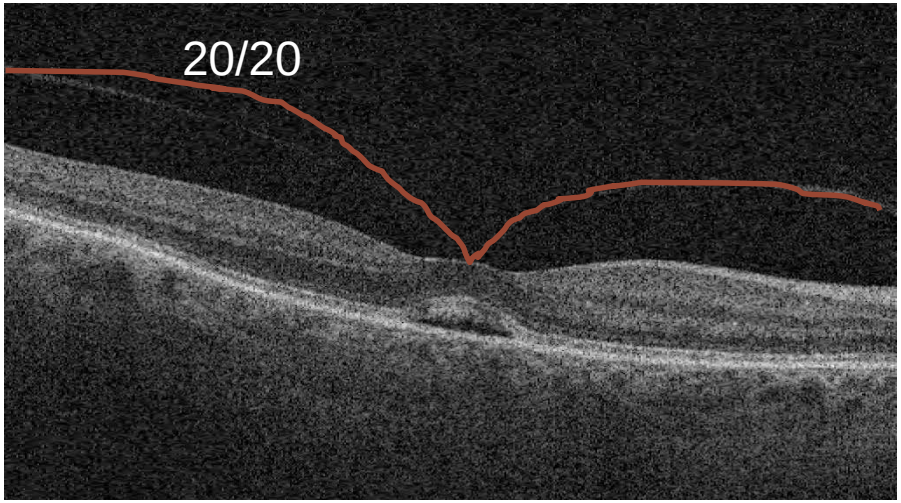


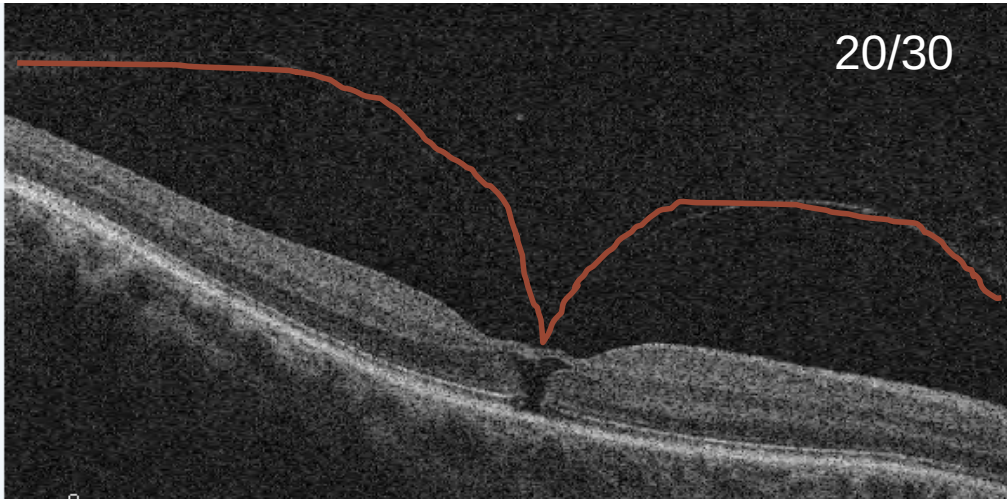
Ophthalmology 2013;120:2611-2619

Stage 1/VMT: **50%** spontaneously resolve

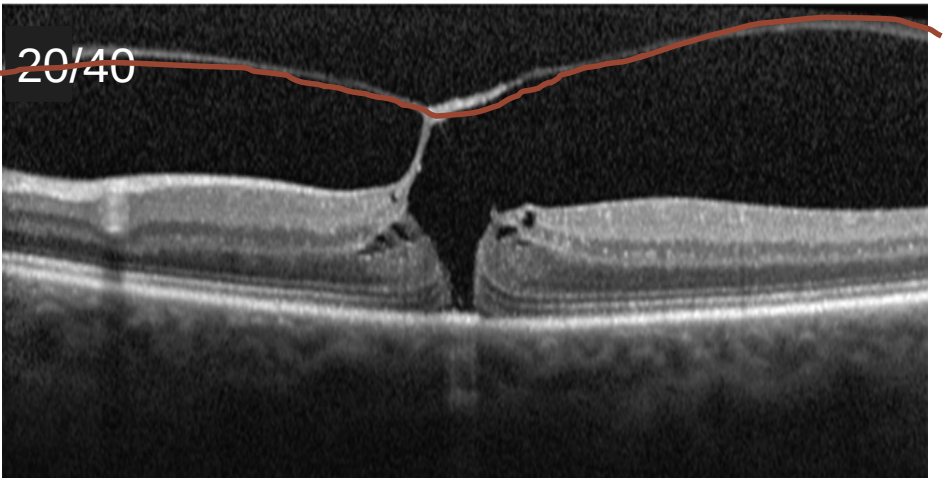


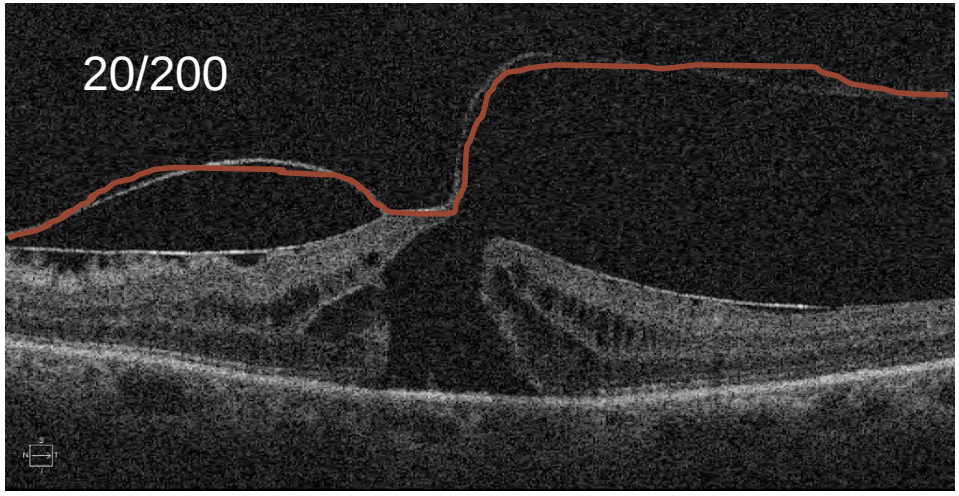


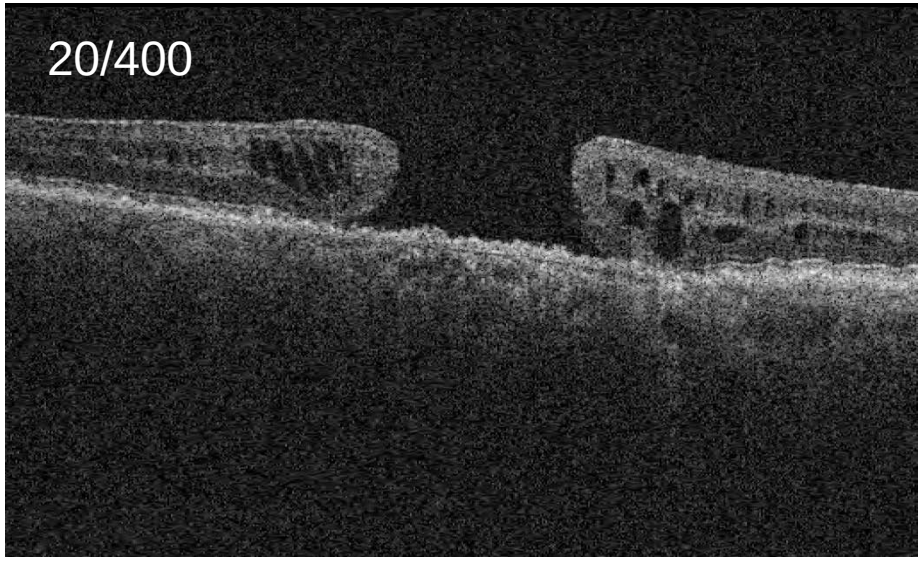


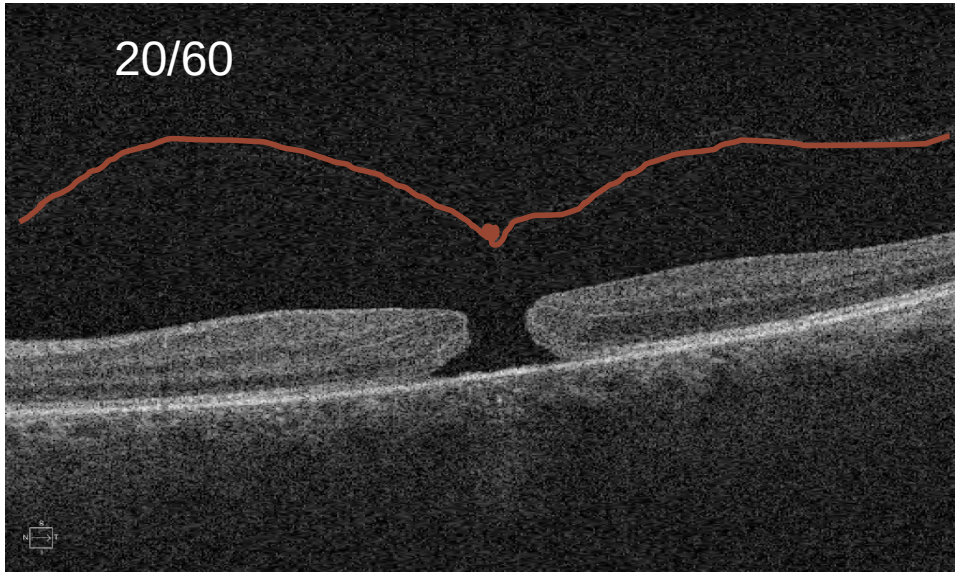


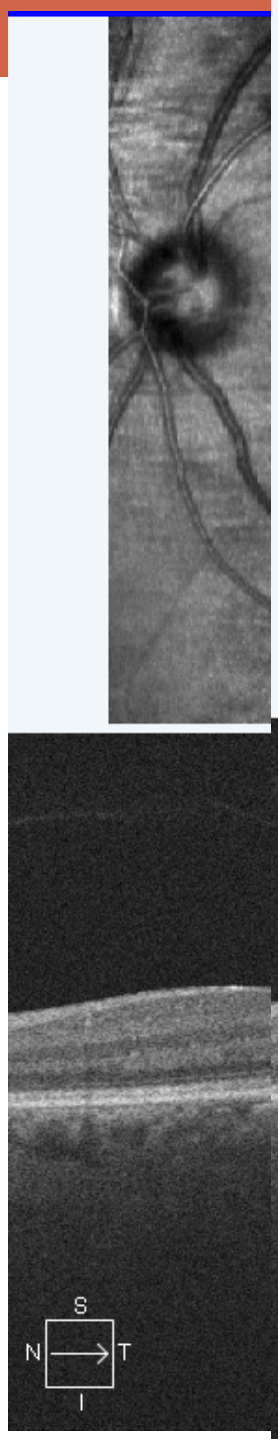
Stages 2, 3, 4/small, med, large +/- VMT: **Full Thickness**







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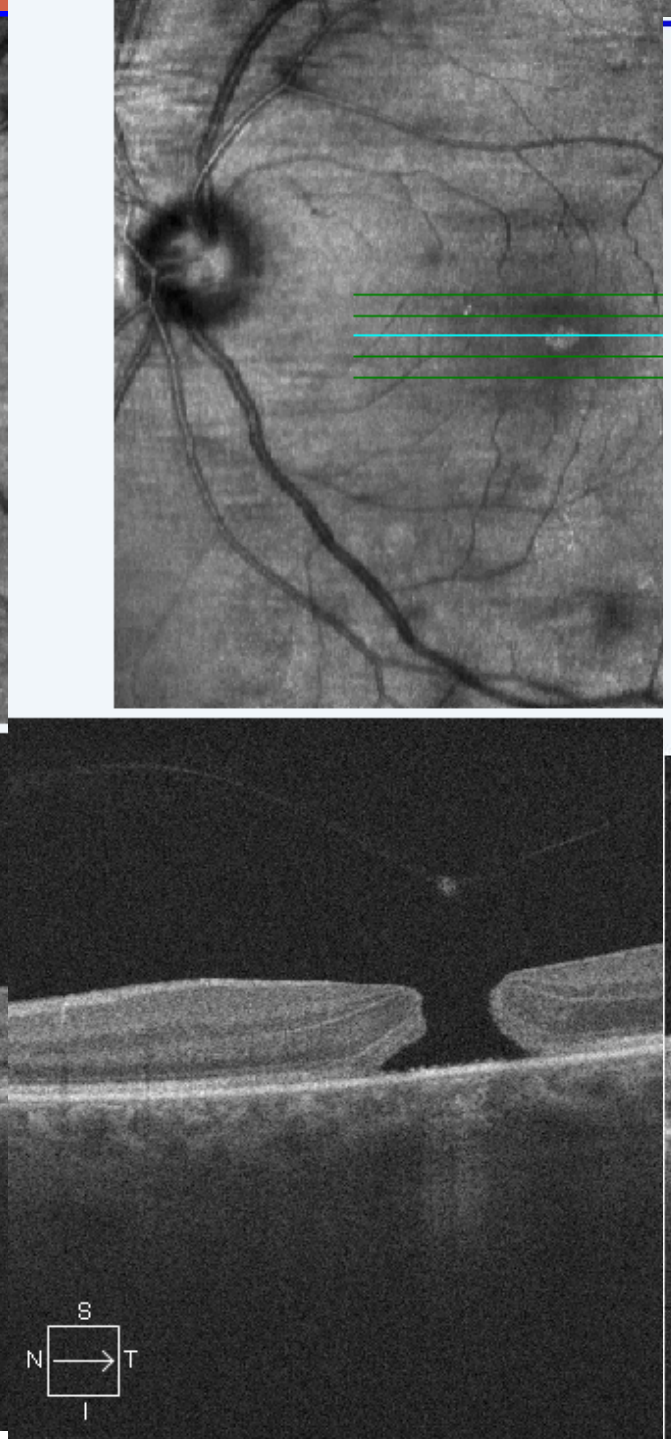
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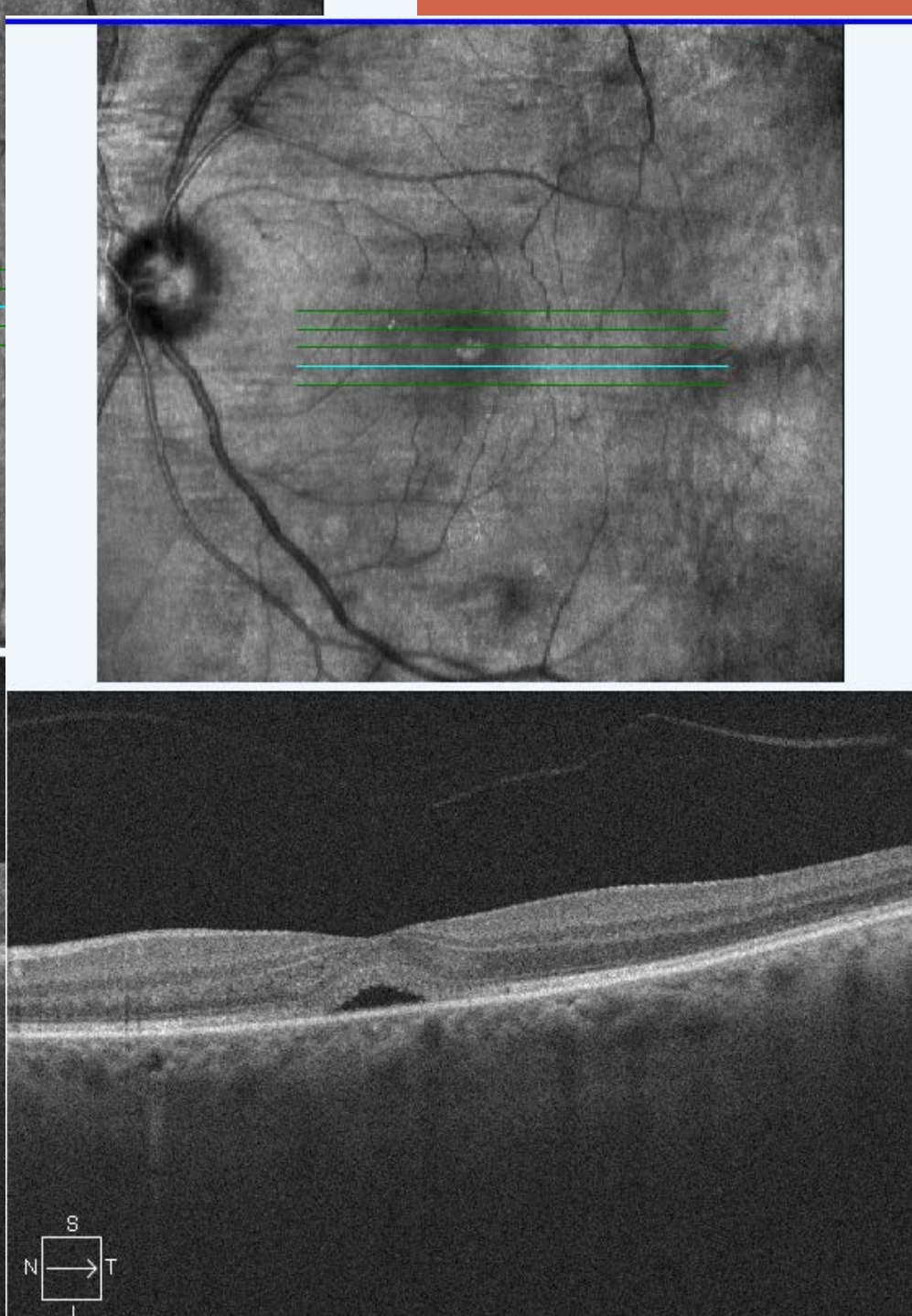
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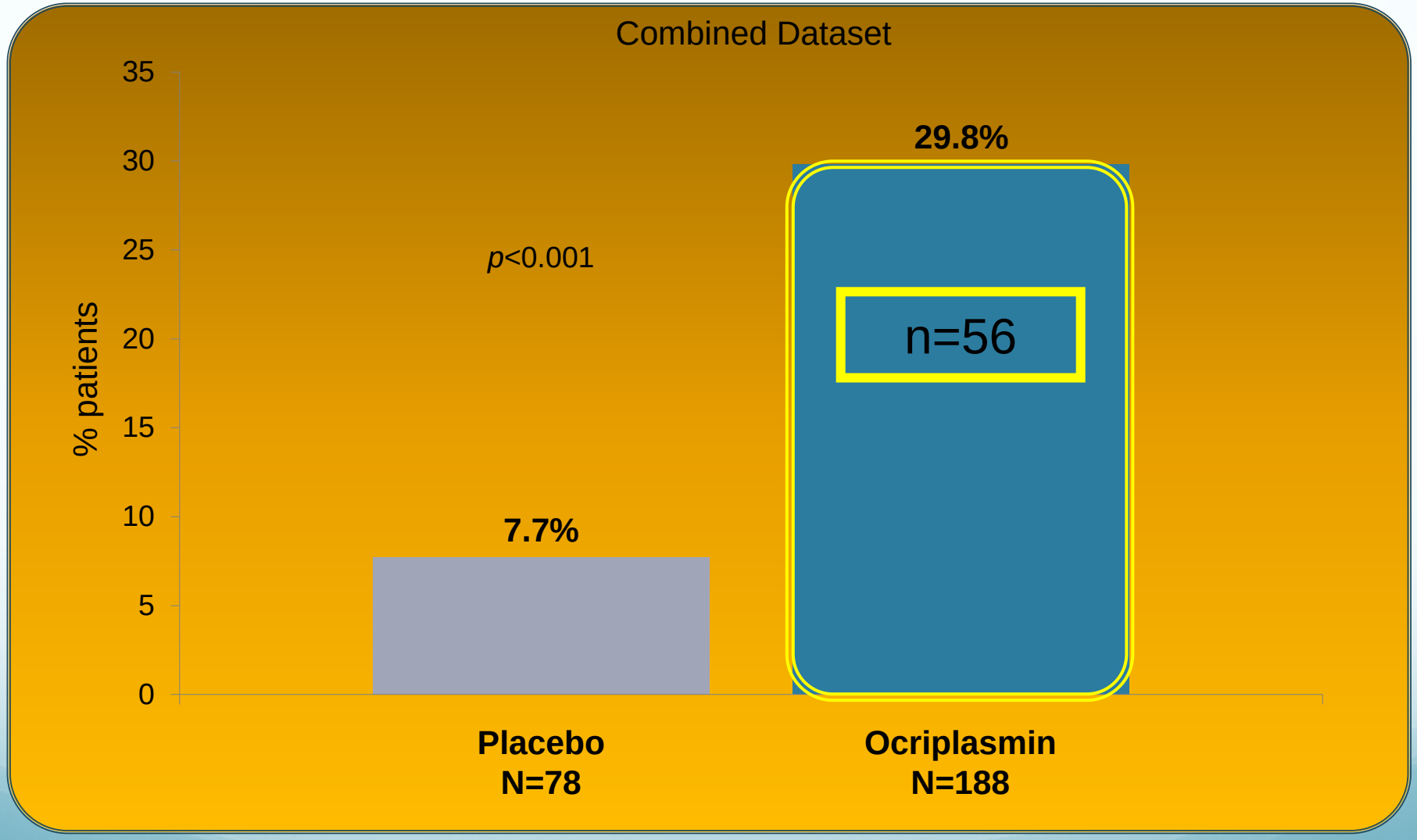
Duker JS, Kaiser PK, Binder S et al. The international vitreomacular traction study group classification of vitreomacular adhesion, traction, and macular hole. Ophthalmology 2013;120:2611-2619

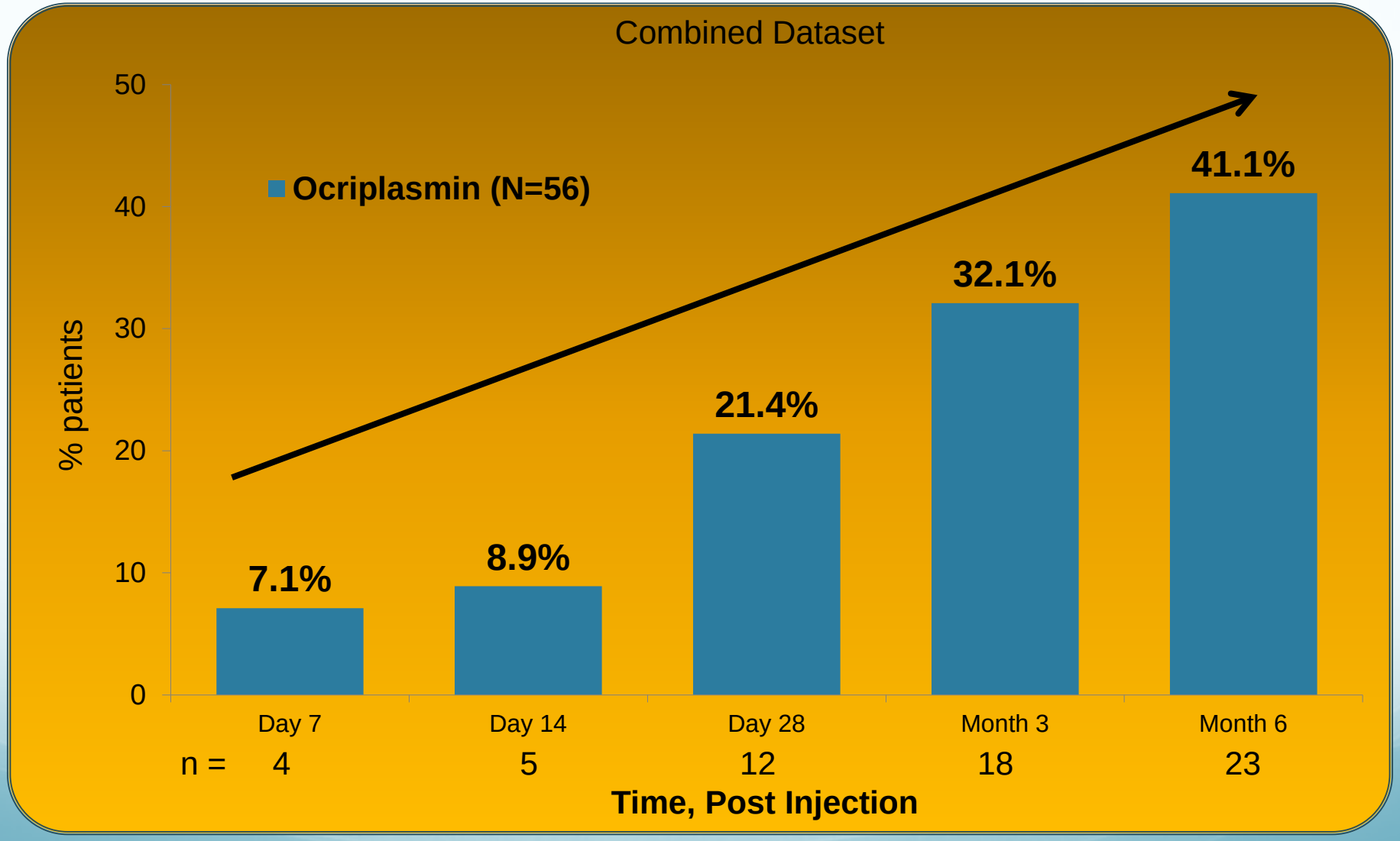
Proportion of VMT Patients with VMA Resolution at Day 28



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)

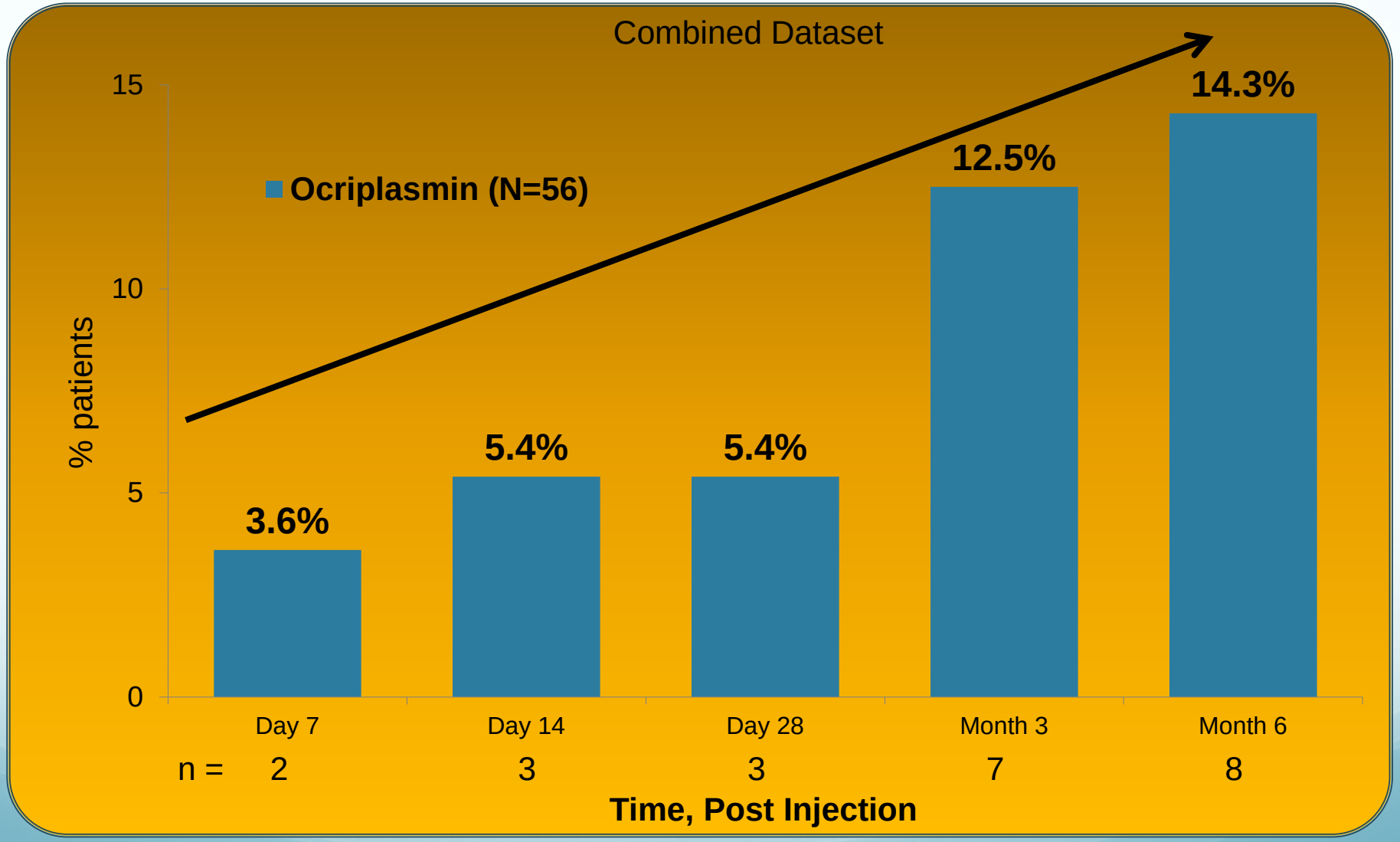


VA: visual acuity; VMT: vitreomacular traction; VMA: vitreomacular adhesion.

Data on file, ThromboGenics.

Proportion of Patients Gaining ≥3 Lines VA

(Ocriplasmin-Treated VMT Patients with VMA Resolution at Day 28)



VA: visual acuity; VMT: vitreomacular traction; VMA: vitreomacular adhesion.

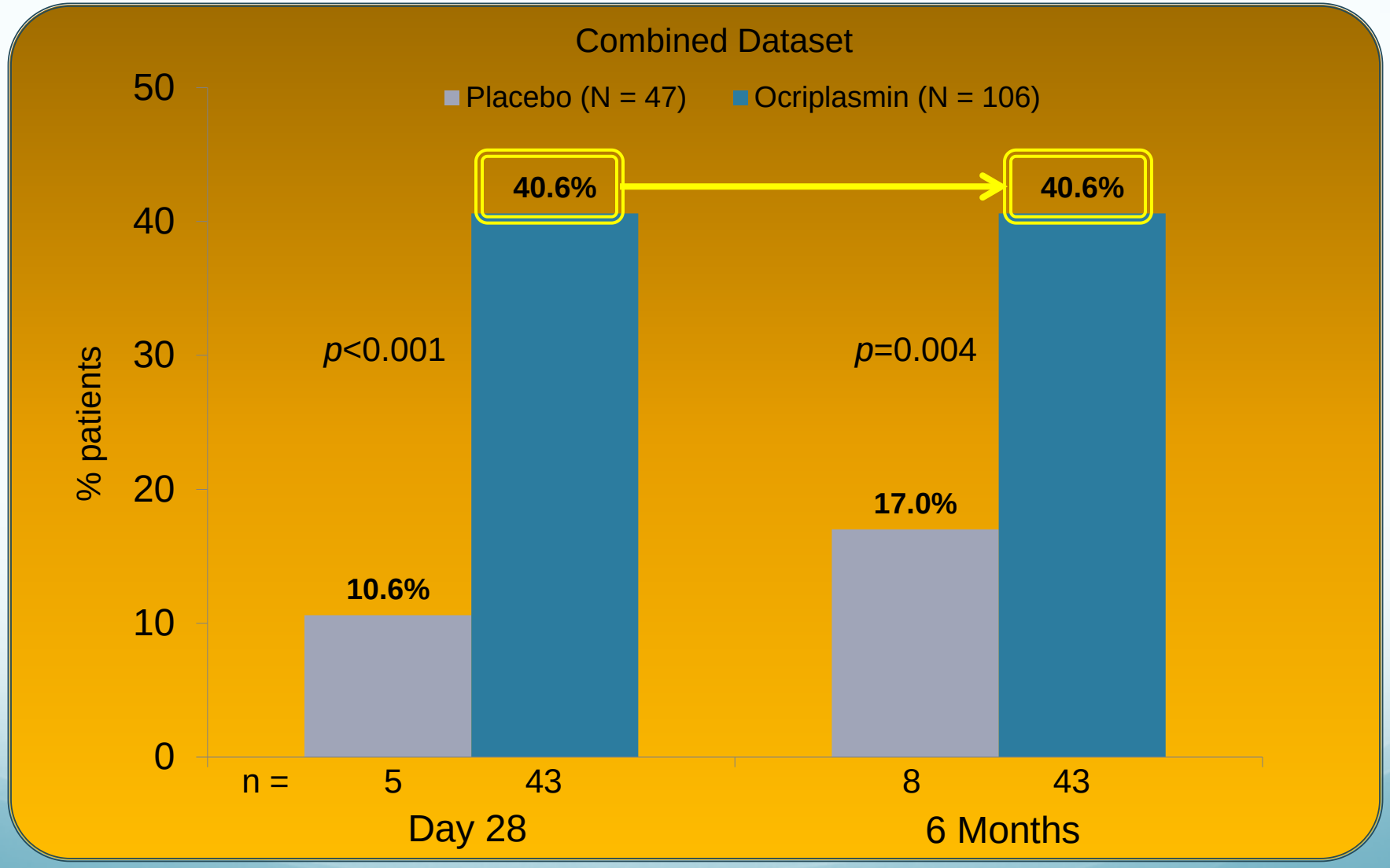
Data on file, ThromboGenics.

Macular Hole Subgroup*

Responder Analysis

*Post-hoc analysis

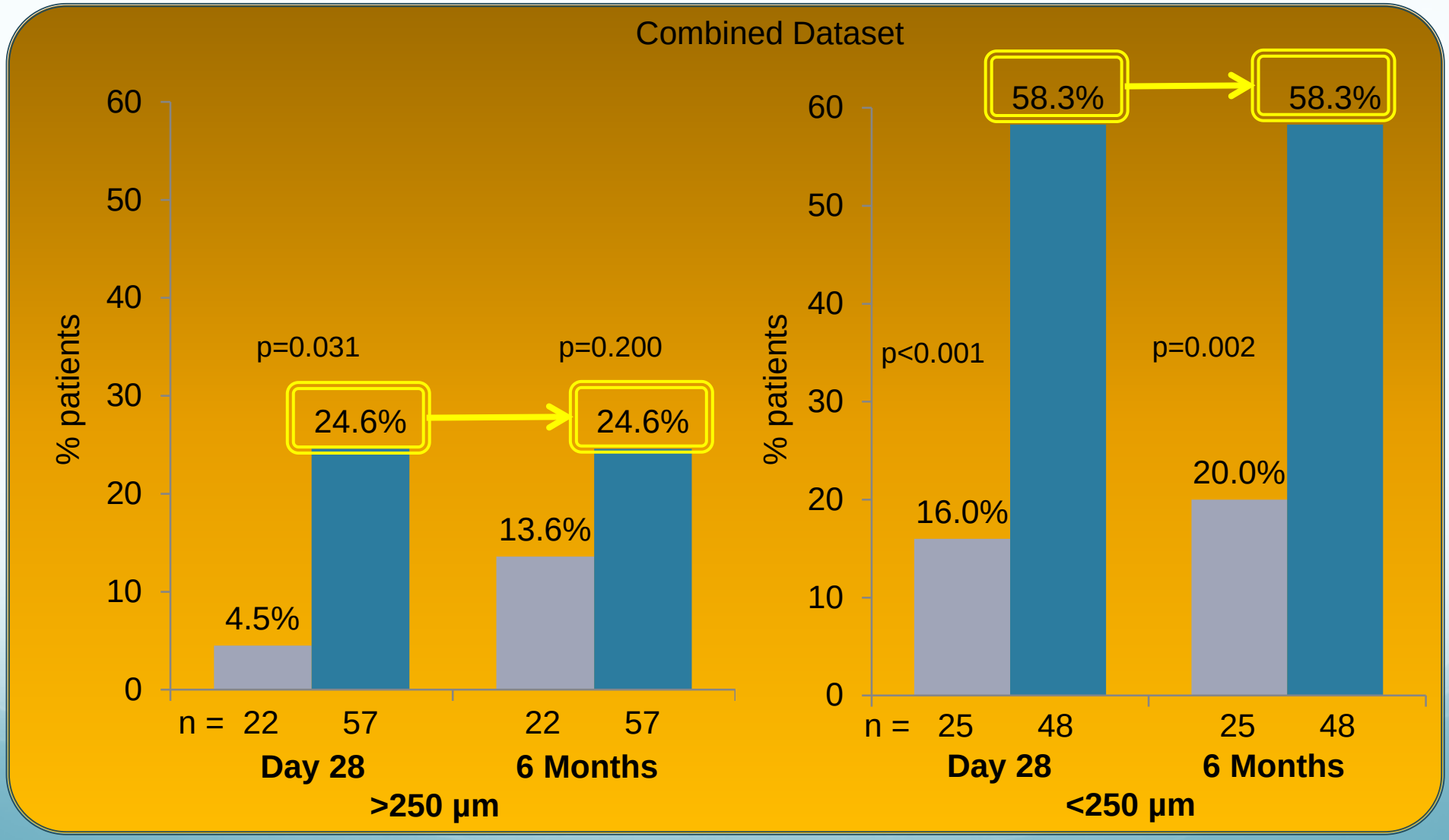
Proportion of Patients with FTMH Closure (without vitrectomy)



FTMH: full thickness macular hole

Data on file, ThromboGenics

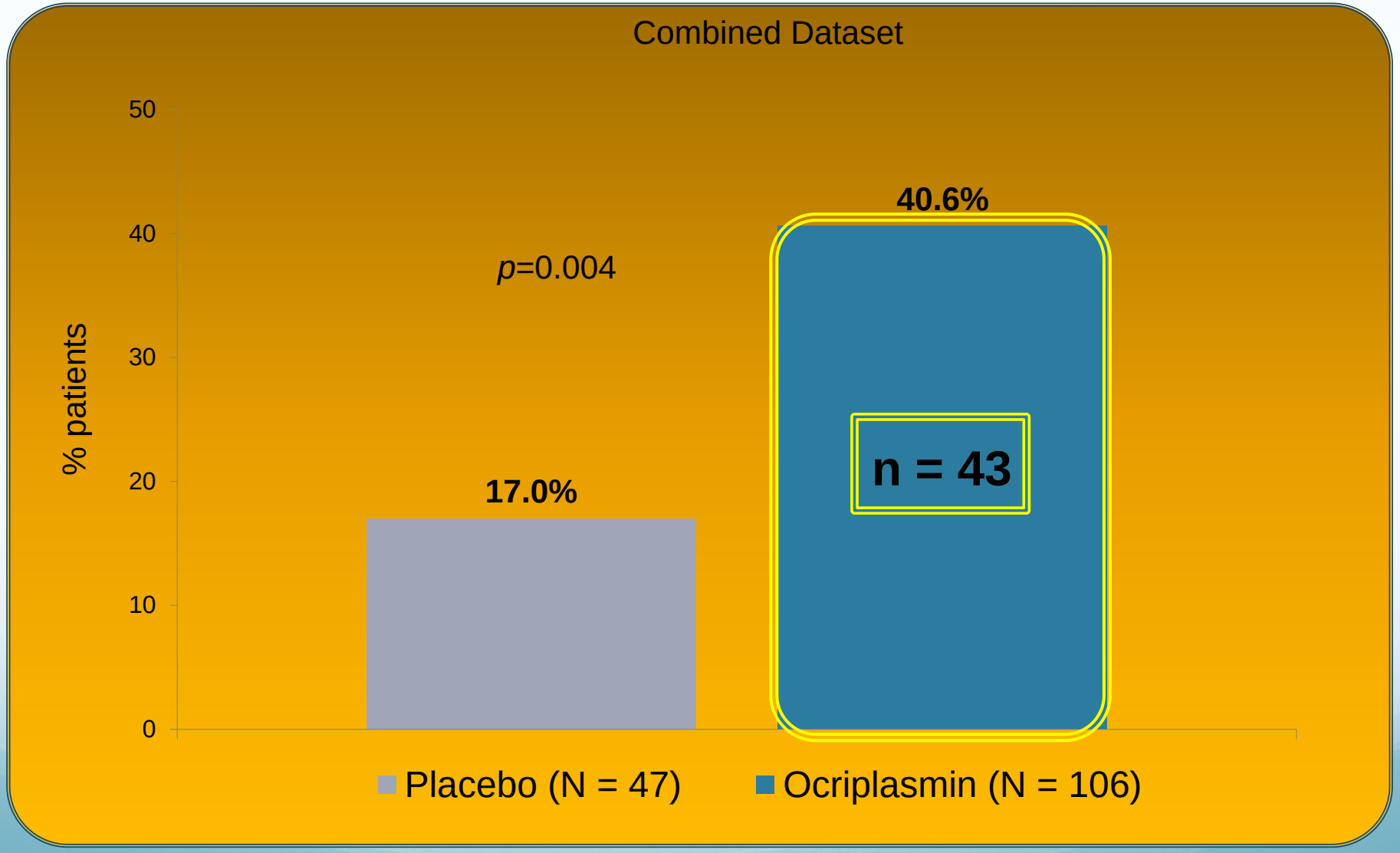
Proportion of Patients with FTMH Closure by Size at Baseline (without vitrectomy)



FTMH: full thickness macular hole

Data on file, ThromboGenics

Proportion of Patients with FTMH Closure at Month 6 (without vitrectomy)

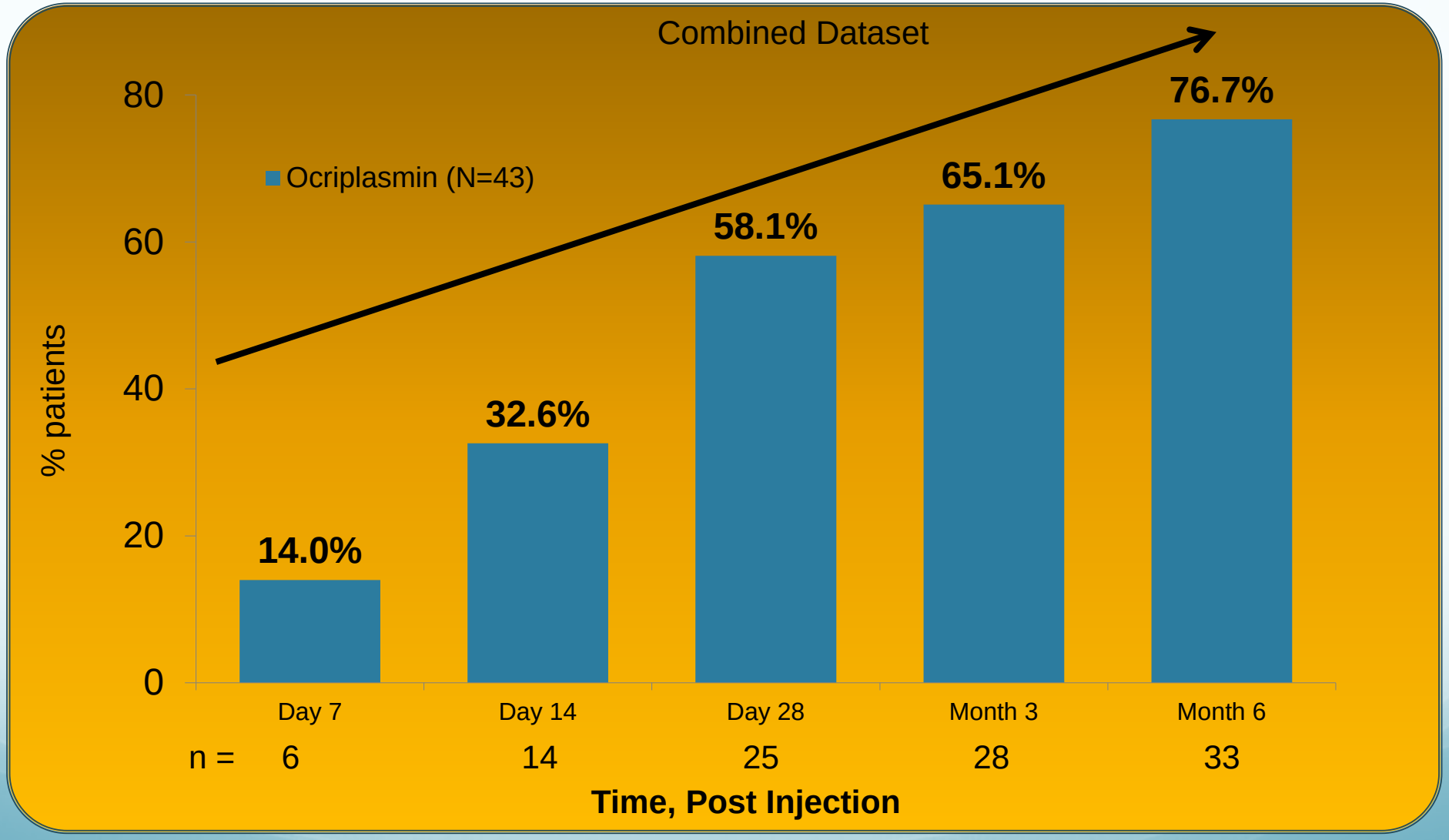


FTMH: full thickness macular hole

Data on file, ThromboGenics

Proportion of Patients Gaining ≥ 2 Lines VA

(Ocriplasmin-Treated Patients with FTMH Closure at Month 6 without Vitrectomy)

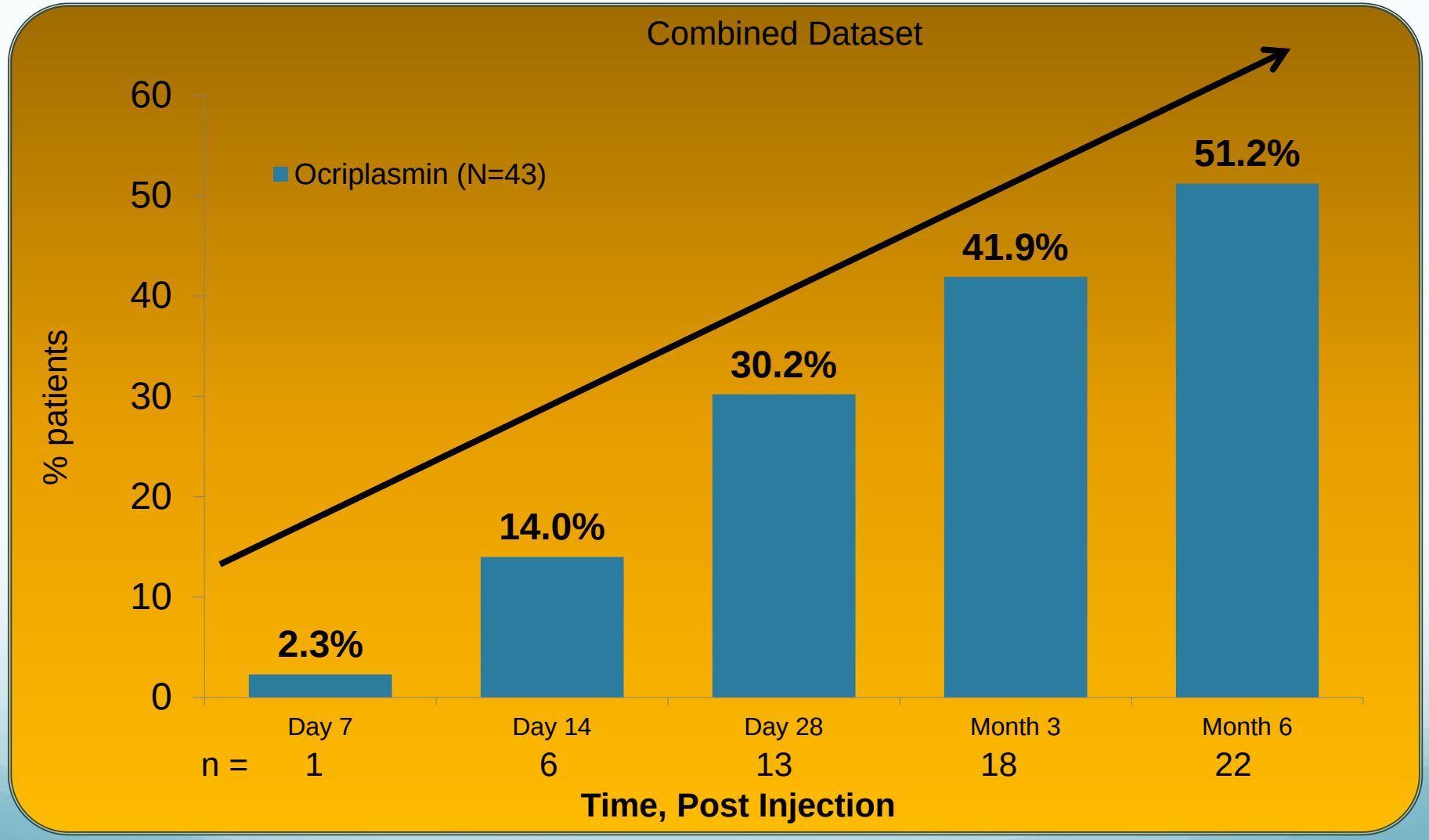


VA: visual acuity, FTMH: full thickness macular hole

Data on file, ThromboGenics

Proportion of Patients Gaining ≥ 3 Lines VA

(Ocriplasmin-Treated Patients with FTMH Closure at Month 6 without Vitrectomy)



VA: visual acuity; FTMH: full thickness macular hole

Data on file, ThromboGenics

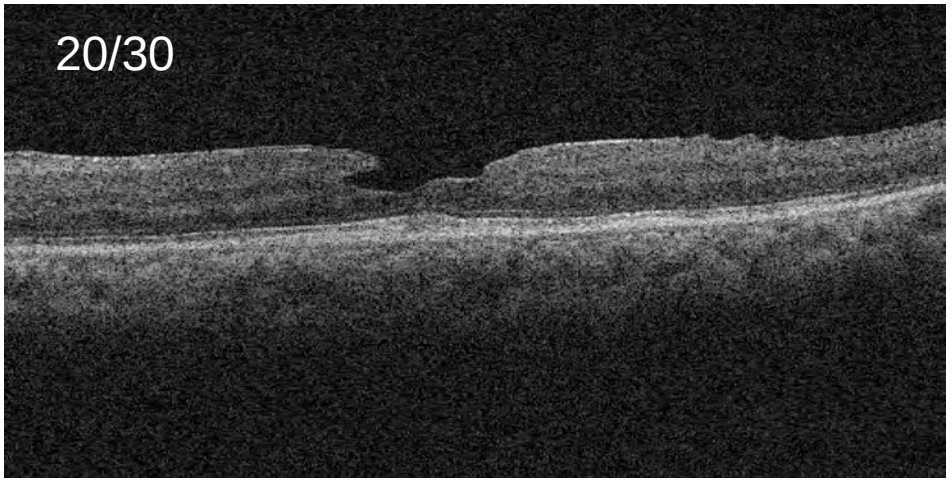
FTMH
Vitrectomy vs. Ocriplasmin

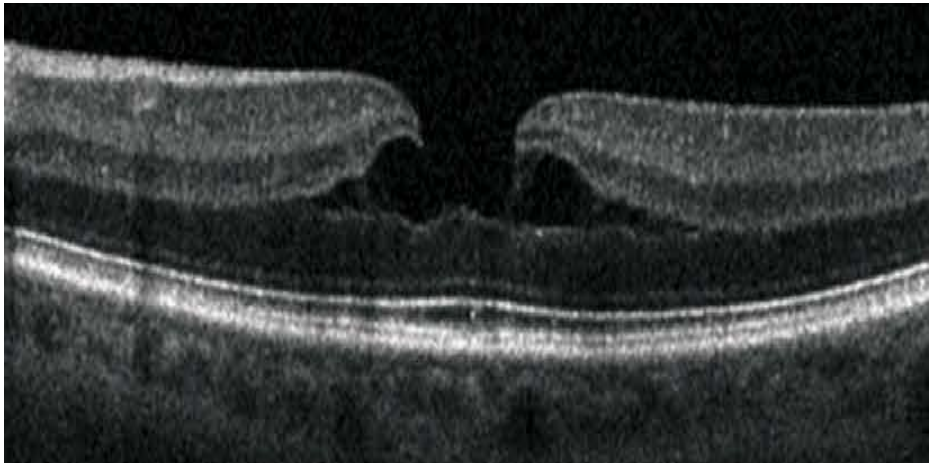
- **Pros**
  - High (>85%) success rate
  - Known long-term side effects
- **Cons**
  - Surgical risks
  - Face down positioning(+/-)
  - Cataract formation

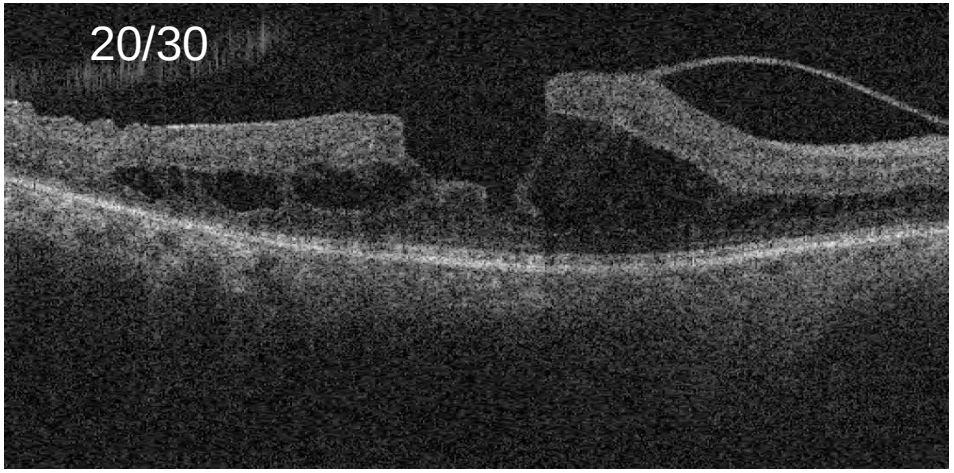
- **Pros**
  - In-office procedure
  - Less $ if successful
  - Avoid surgery/earlier cataract formation if successful
  - No face down positioning
- **Cons**
  - Lower (~40%) success rate
  - Surgery needed if fails
  - Long term side effects not known
  - Risks: tears, dyschromatopsias
    - Avoid in high risk RD patients

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



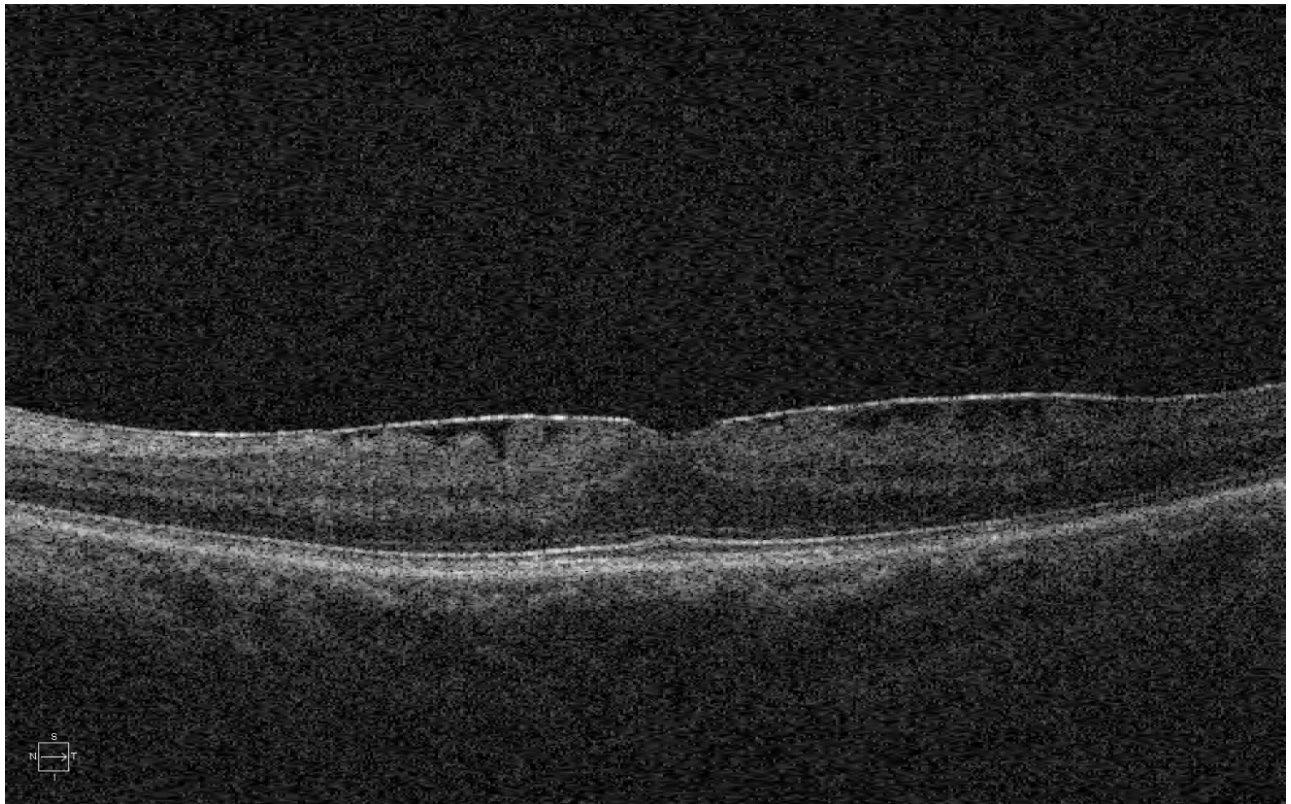




Duker JS, Kaiser PK, Binder S et al. The international vitreomacular traction study group classification of vitreomacular adhesion, traction, and macular hole. Ophthalmology 2013;120:2611-2619

Macular Pseudohole

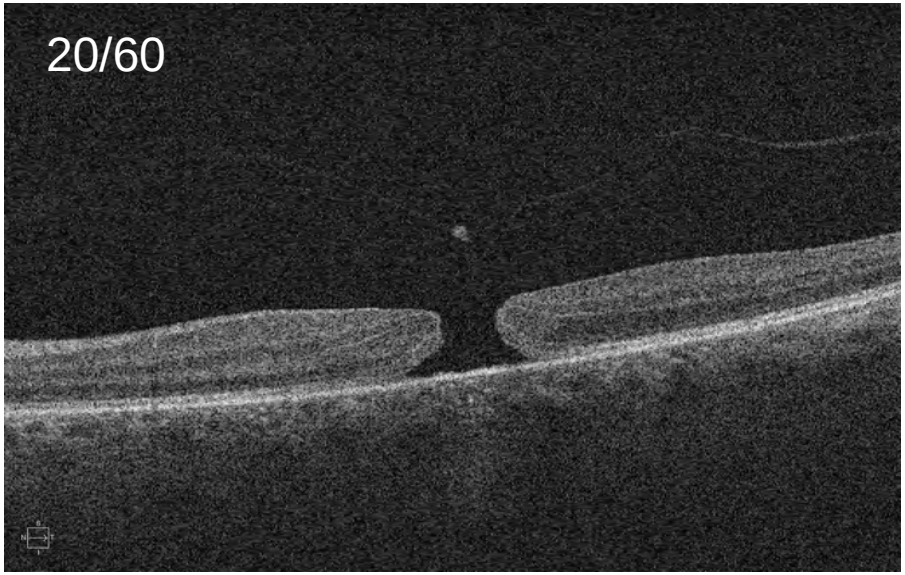
- Criteria
  1. ERM
  2. No loss of tissue
  3. Heaped foveal edges
  4. Near normal foveal thickness



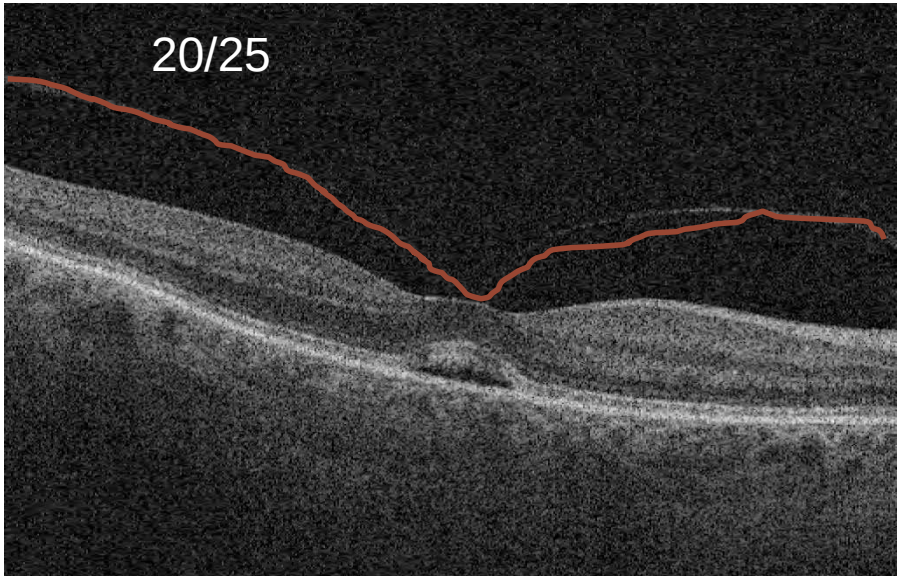
Stage 0/Impending Macular Hole

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

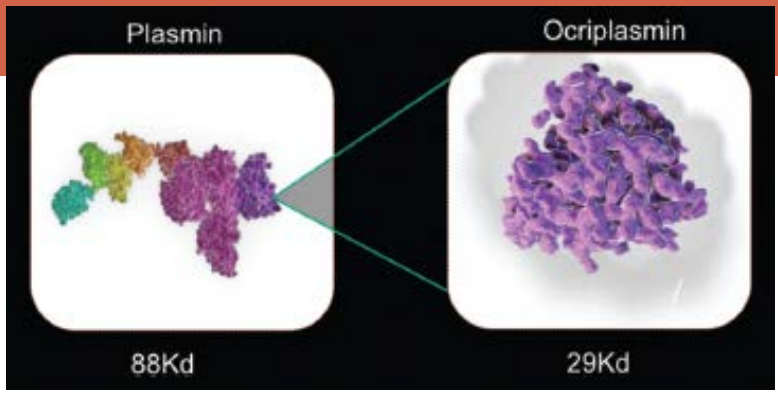
OD: FTMH



OS: Impending mac hole



Ocriplasmin (Jetrea)

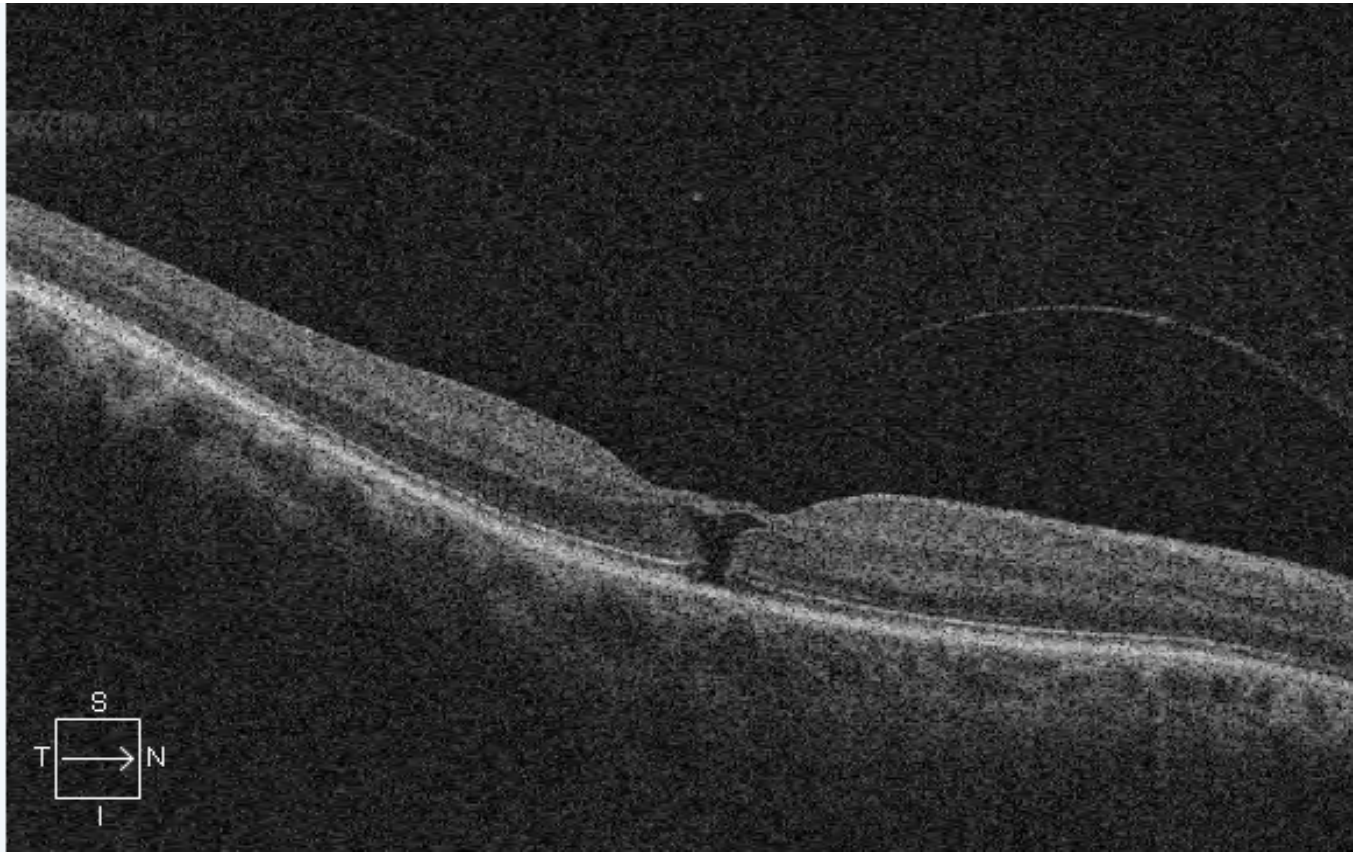


- "Symptomatic Vitreo-macular Adhesion"
- FDA Approved 2012
- MIVI-TRUST Trials
  - FTMH closure (~40%) vs. placebo (~10%)
  - VMT resolution (~29%) vs. placebo (~8%)
  - Smaller holes/more focal adhesion did better
  - Can't have ERM
- Recommend treatment for:
  - Symptomatic VMT or smaller macular holes (<400 um) with VMT

Back to our patient: Case #1: 46 y.o. AAF

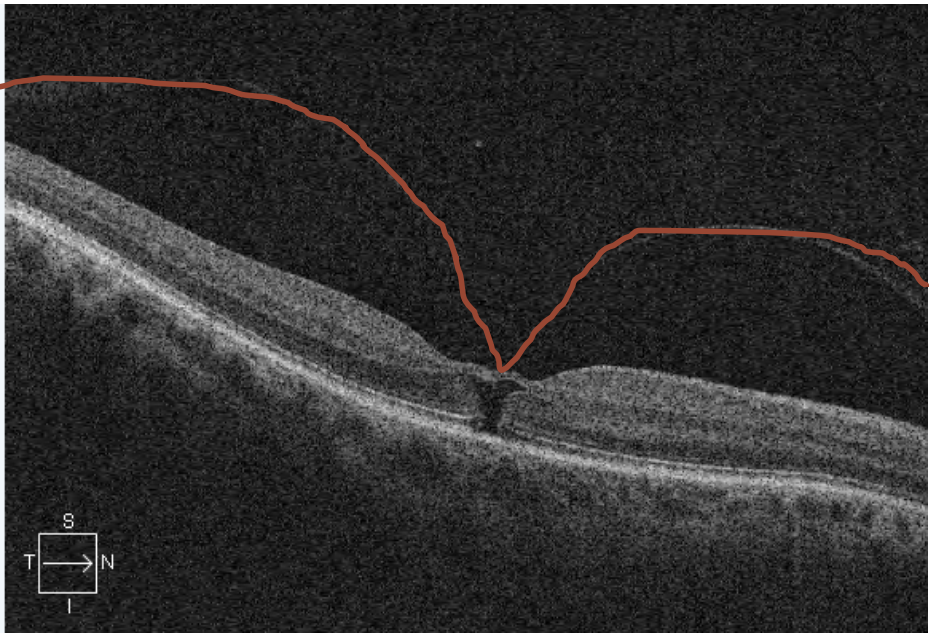
BCVA: OD 20/30
OS 20/20

“Severe” visual distortion OD x 2 weeks

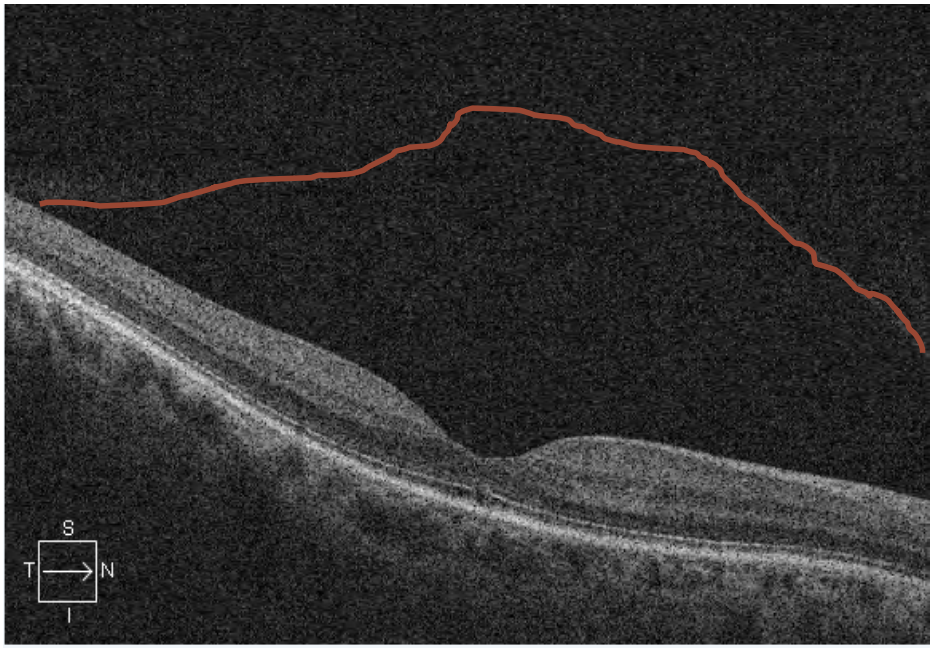


Back to our patient…

OD: 8/2/2014 20/30

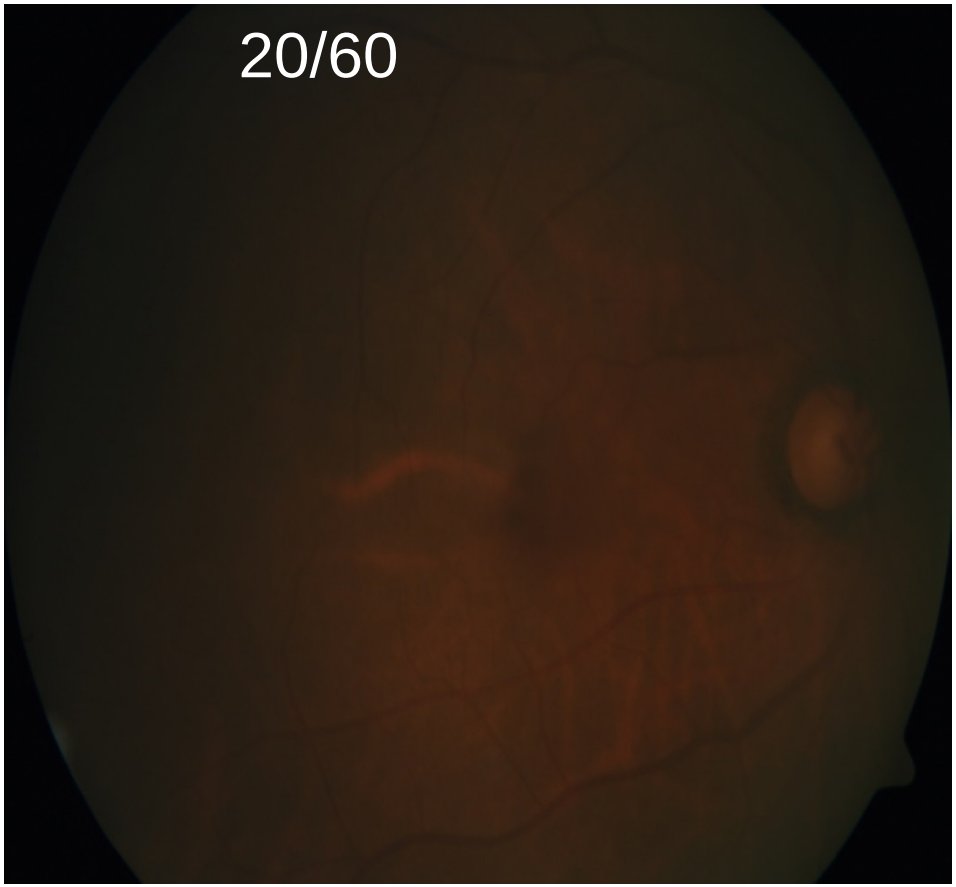


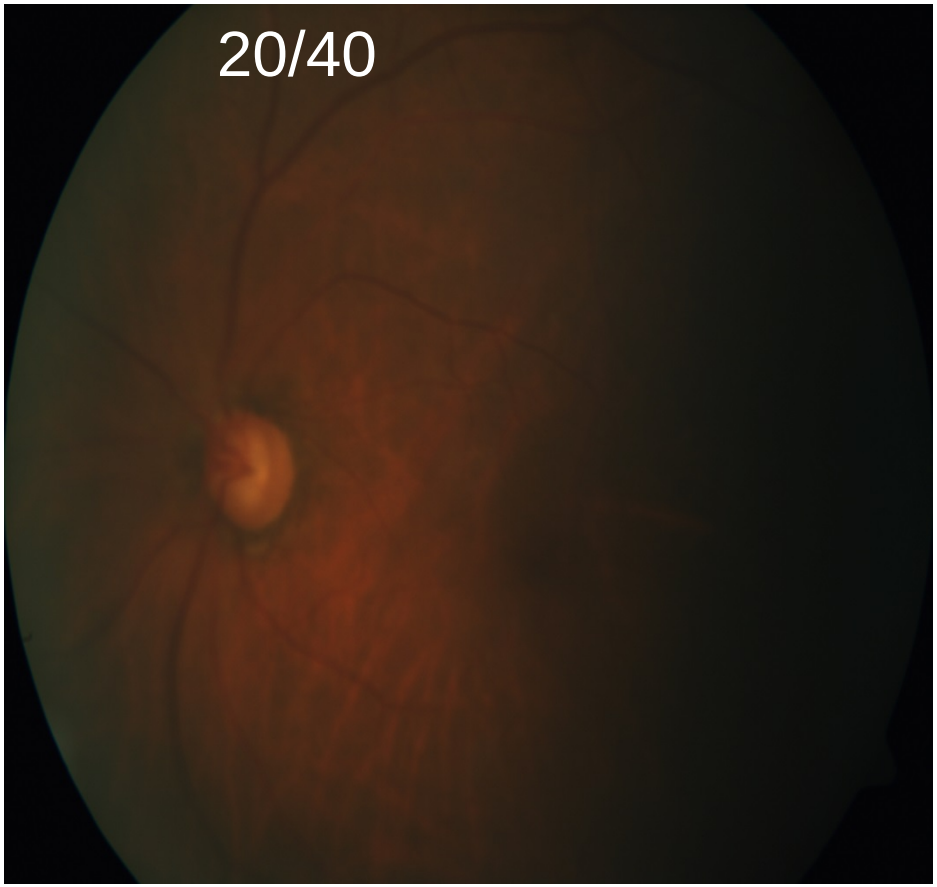
OD: 9/5/2014 20/25



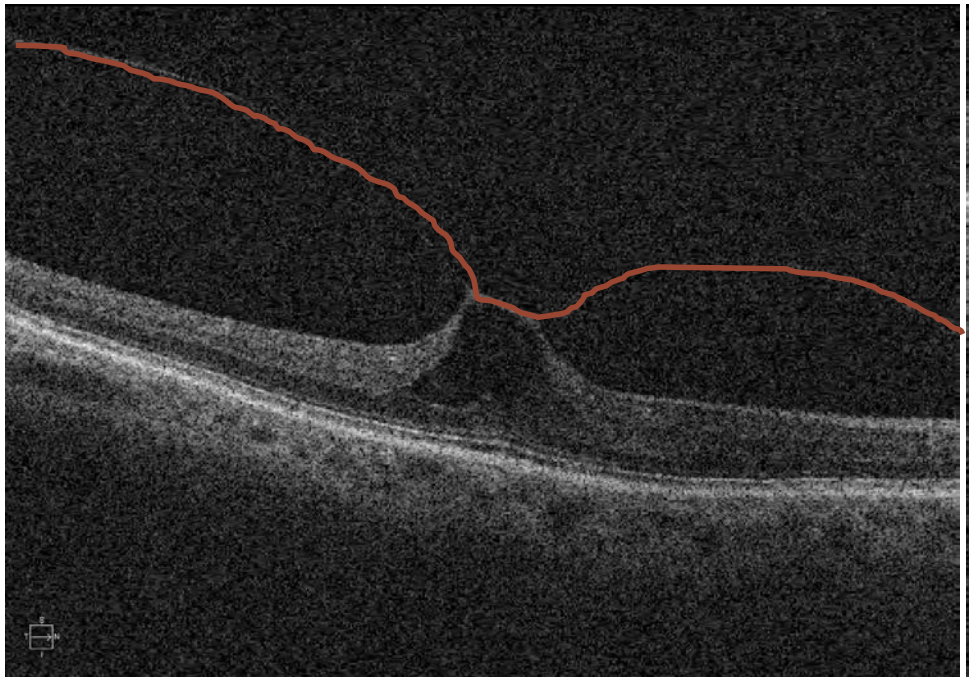
She chose: MONITOR

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

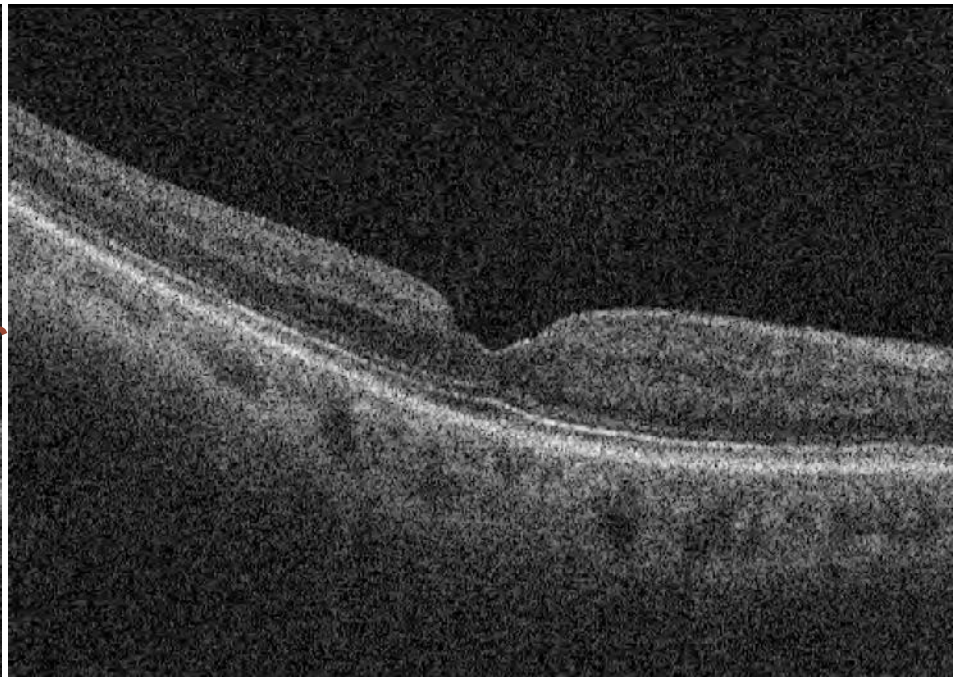




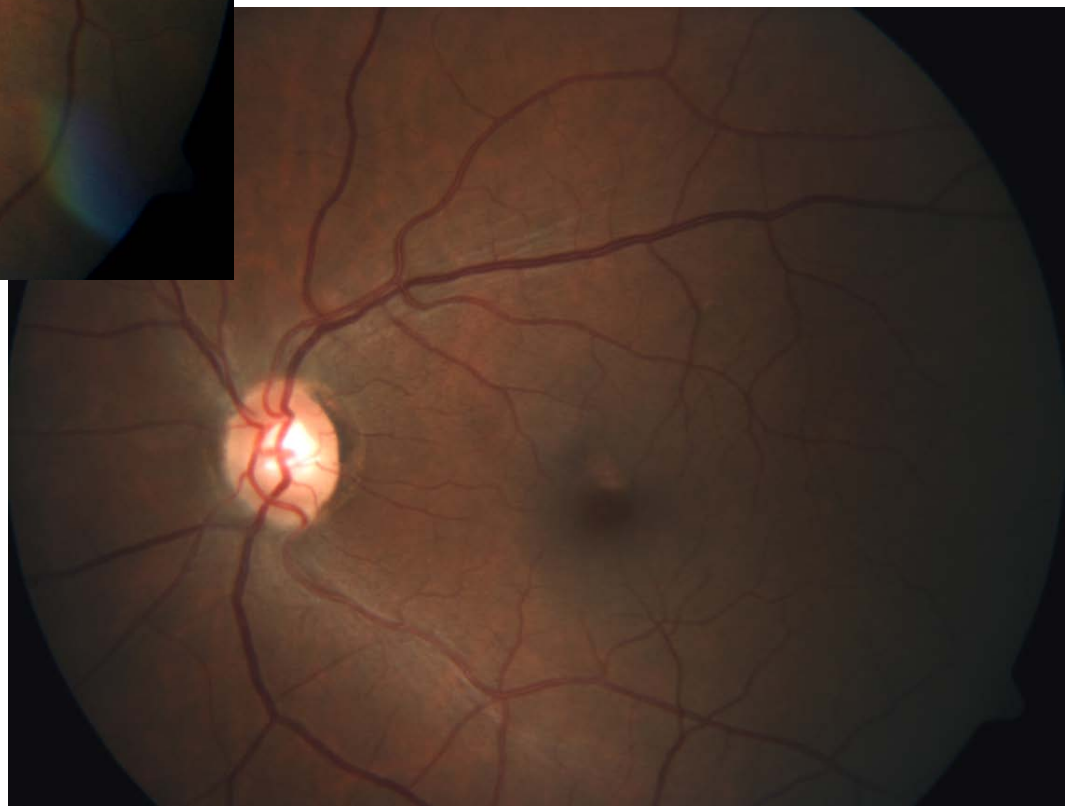
OD



OS



Case #3

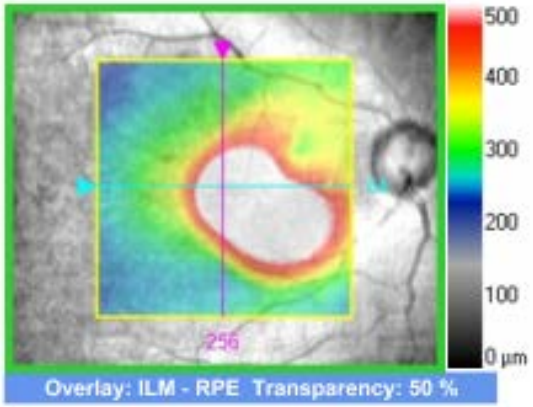


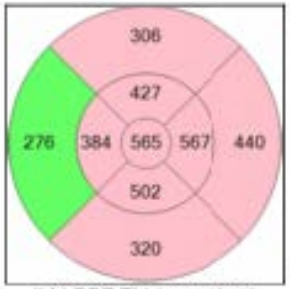
31 y.o. attorney decreased vision
X 3 weeks

VA 20/50 OD
20/20 OS

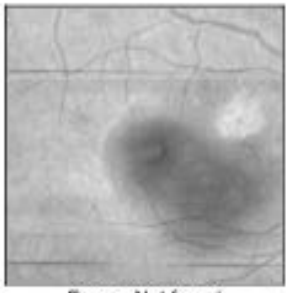
Macula Thickness : Macular Cube 512x128

OD ● ○ OS

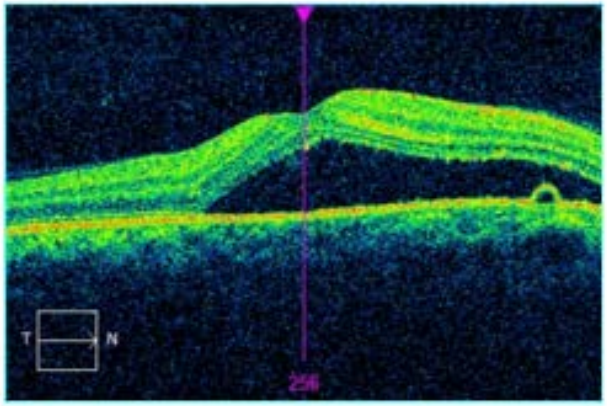


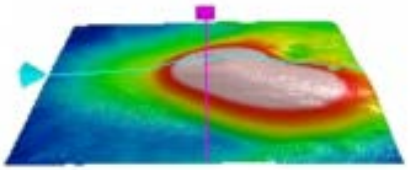


ILM-RPE Thickness (µm)

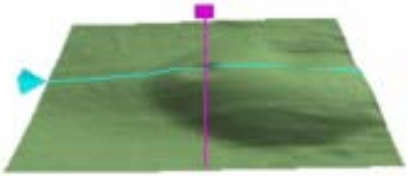


Fovea: Not found

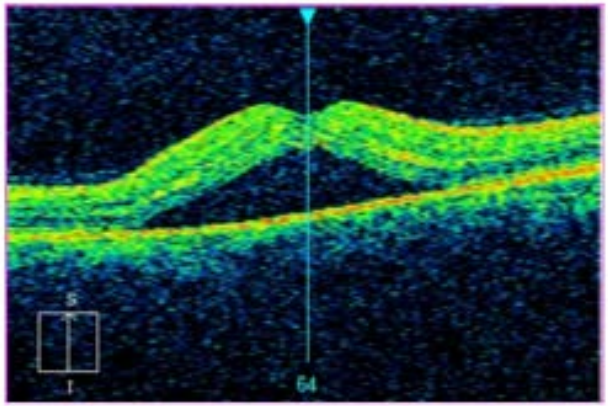


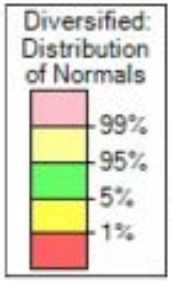


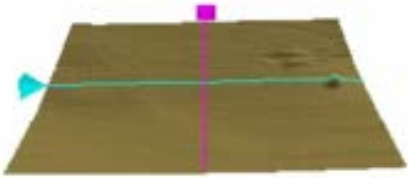
ILM - RPE



ILM

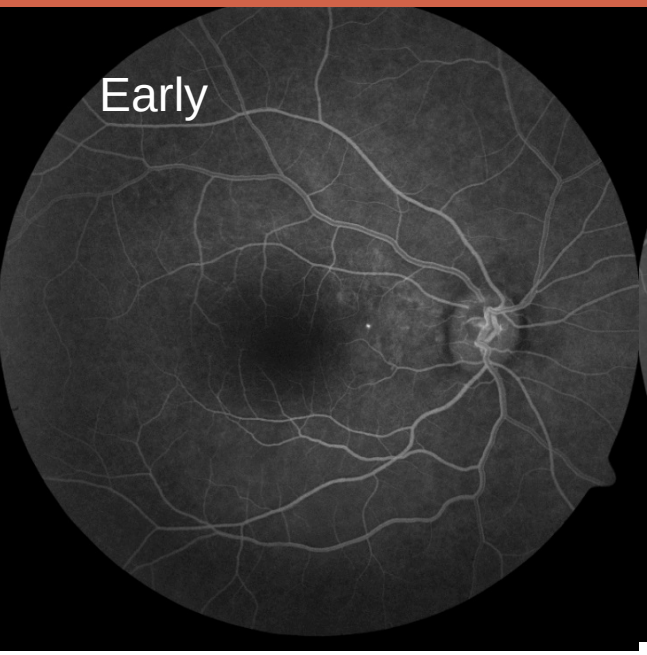


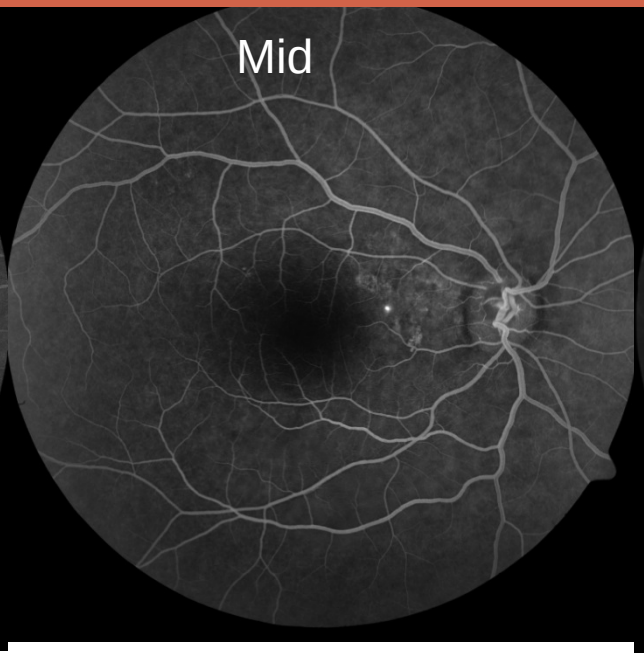




RPE

⚠	Central Subfield Thickness (µm)	Cube Volume (mm³)	Cube Average Thickness (µm)
ILM - RPE	565	12.7	351


Early


Mid


Late

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: exspansile 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

- Br J Ophthalmol. 2010 Jul 19. Lim JW et al.
- **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

CSCR – Therapeutic Interventions

- Ophthalmology. 2008 Oct;115(10):1756-65.
- Chan WM, Lai TY, Lai RY, Liu DT, Lam DS.
- **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_{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
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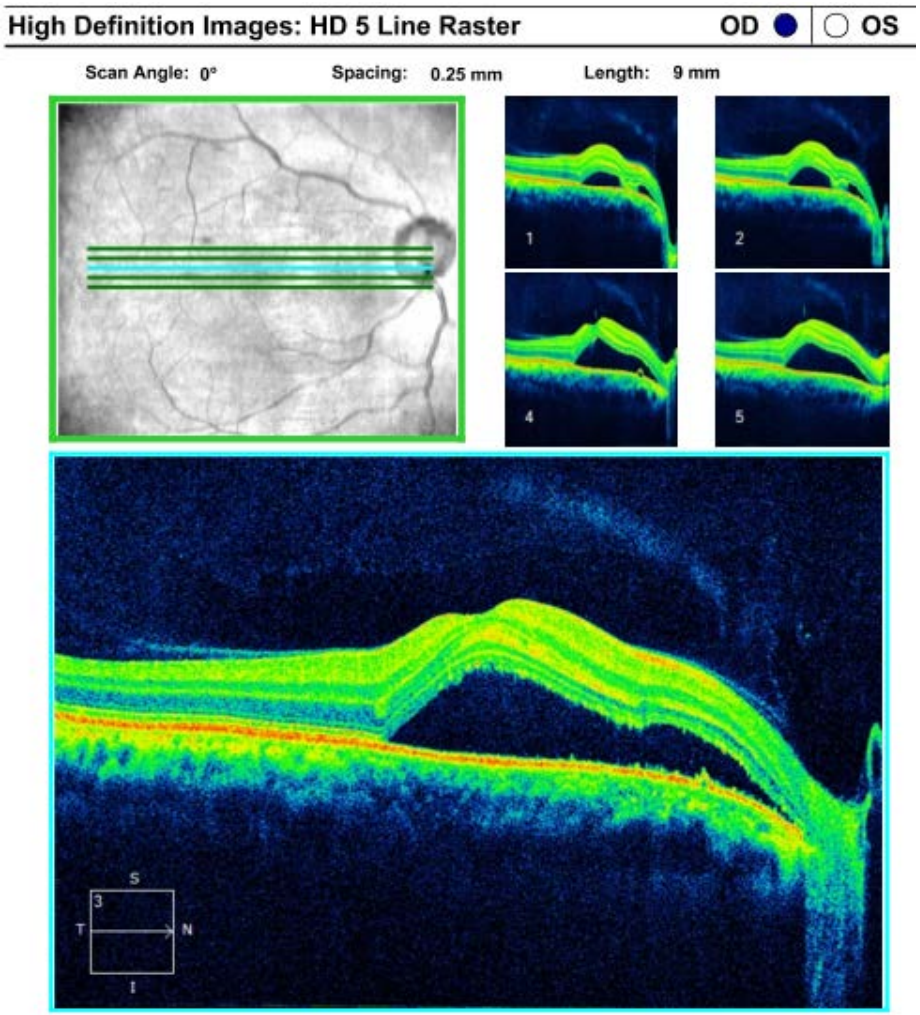
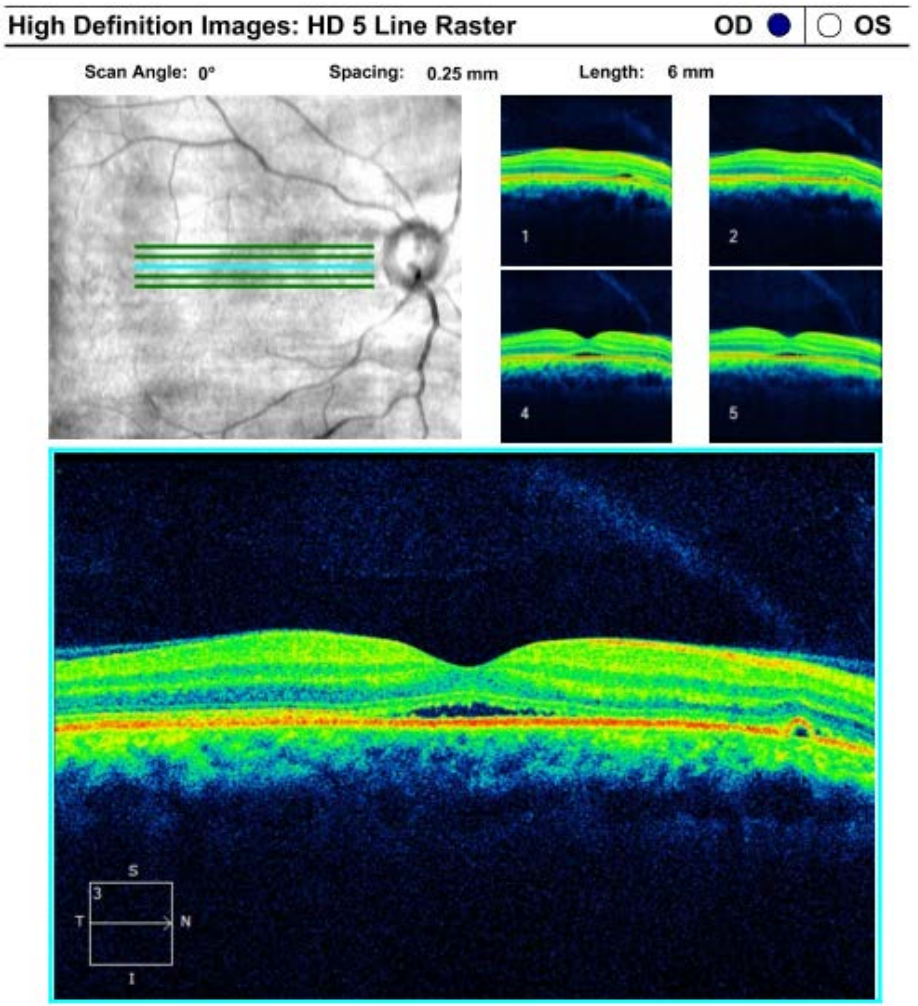
  - c) Perform fluorescein-angiography-guided photodynamic therapy
  - d) Initiate oral therapy with mefipristone
  - e) Recommend lifestyle modification…consider career change

Initial presentation



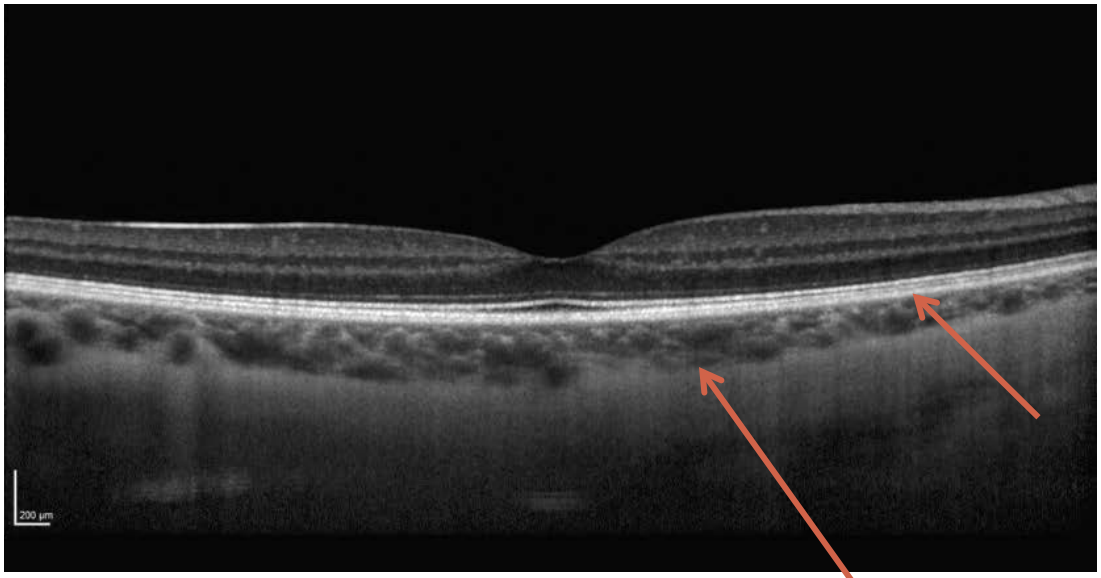
1 month



Enhanced Depth Imaging

- Increased visualization of choroidal anatomy

Normal

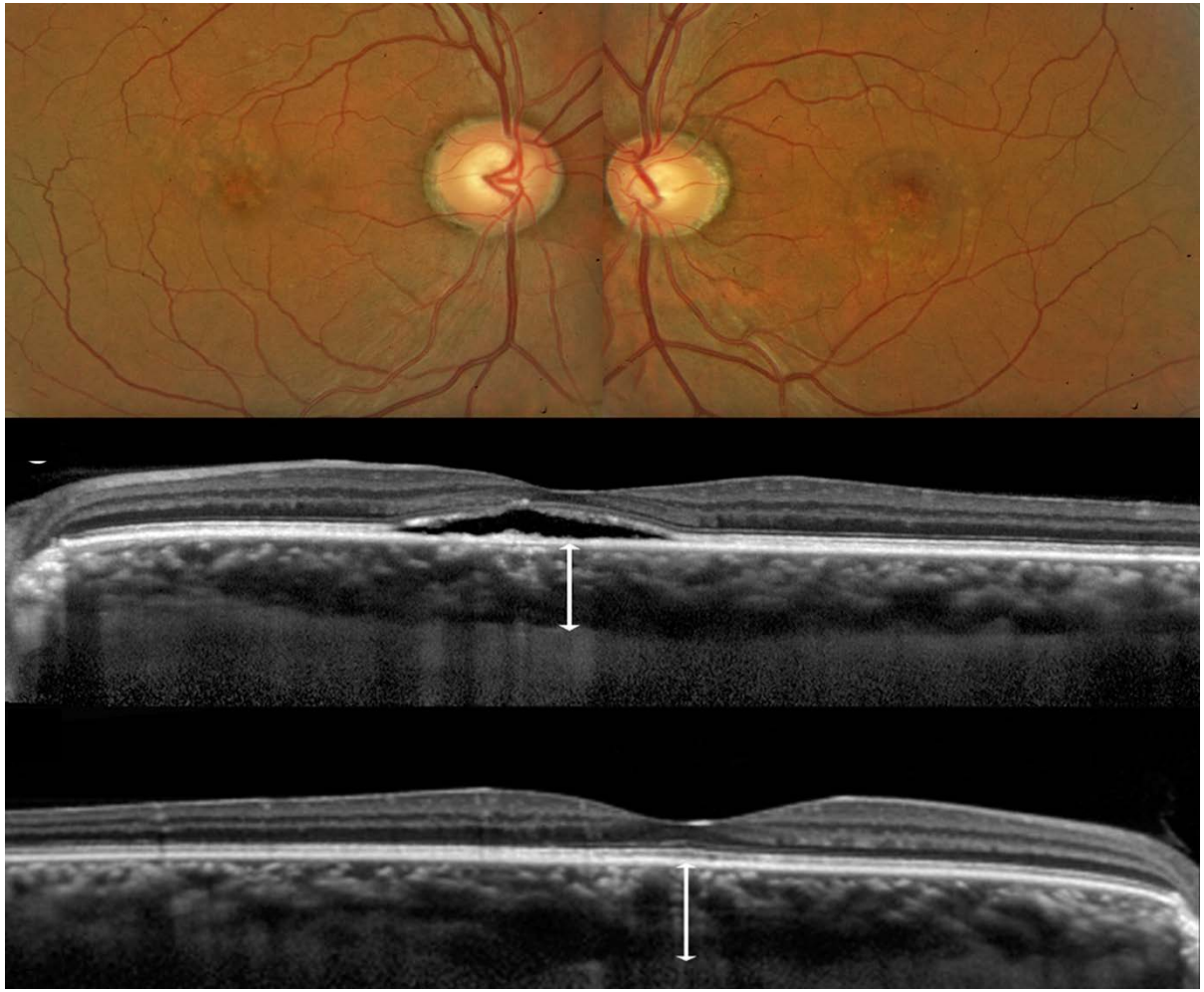


Outer border of RPE/
Bruch's complex

Choroid/sclera junction

Enhanced Depth Imaging CSCR

- Choroidal hyperpermeability/thickening in BOTH eyes



Mrejen S. OCT: Imaging of the choroid and beyond. Surv Ophthalmol 2013;58:387-489

Central Serous Chorio-Retinopathy (CSCR)

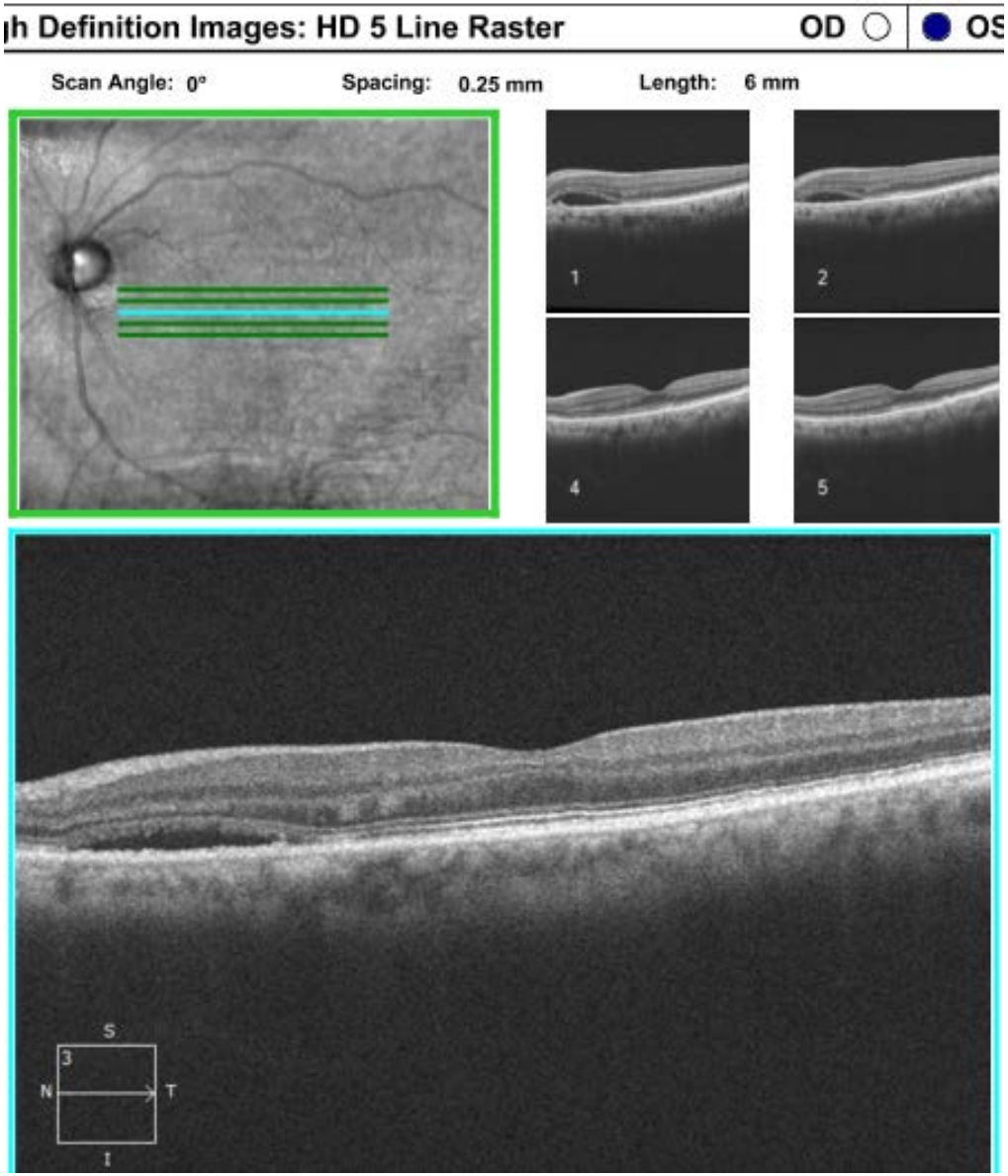
- Treatments
  - Observation
  - Laser photocoagulation
  - PDT

- 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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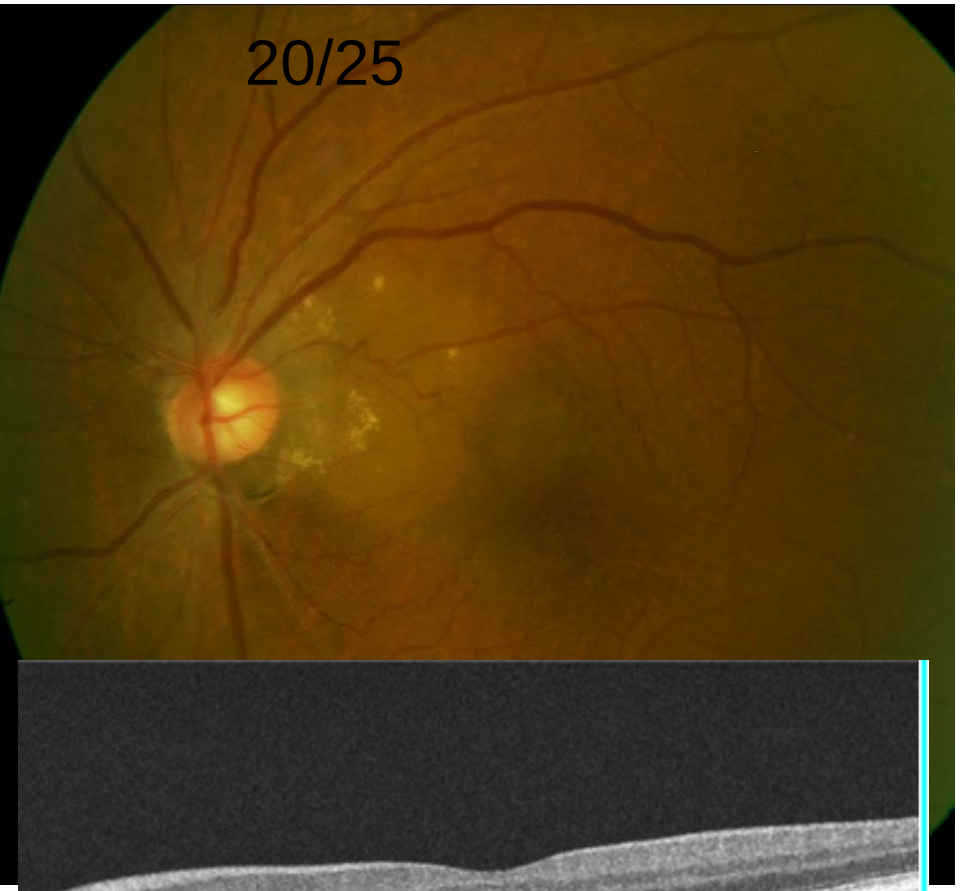
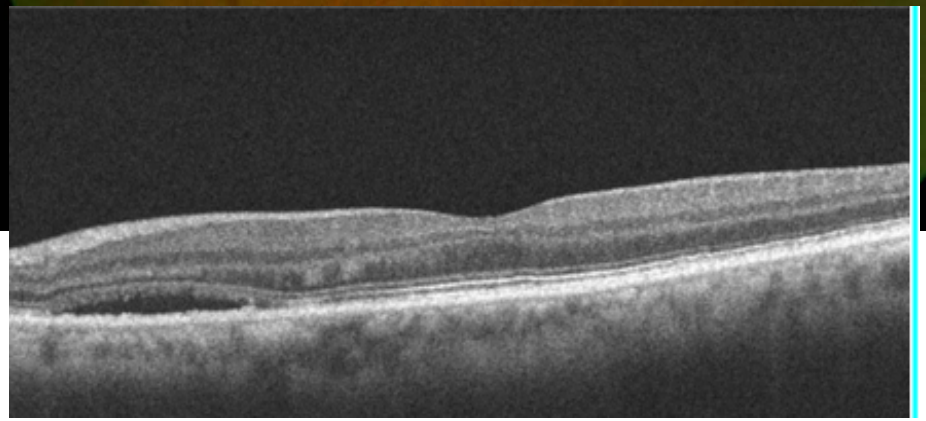
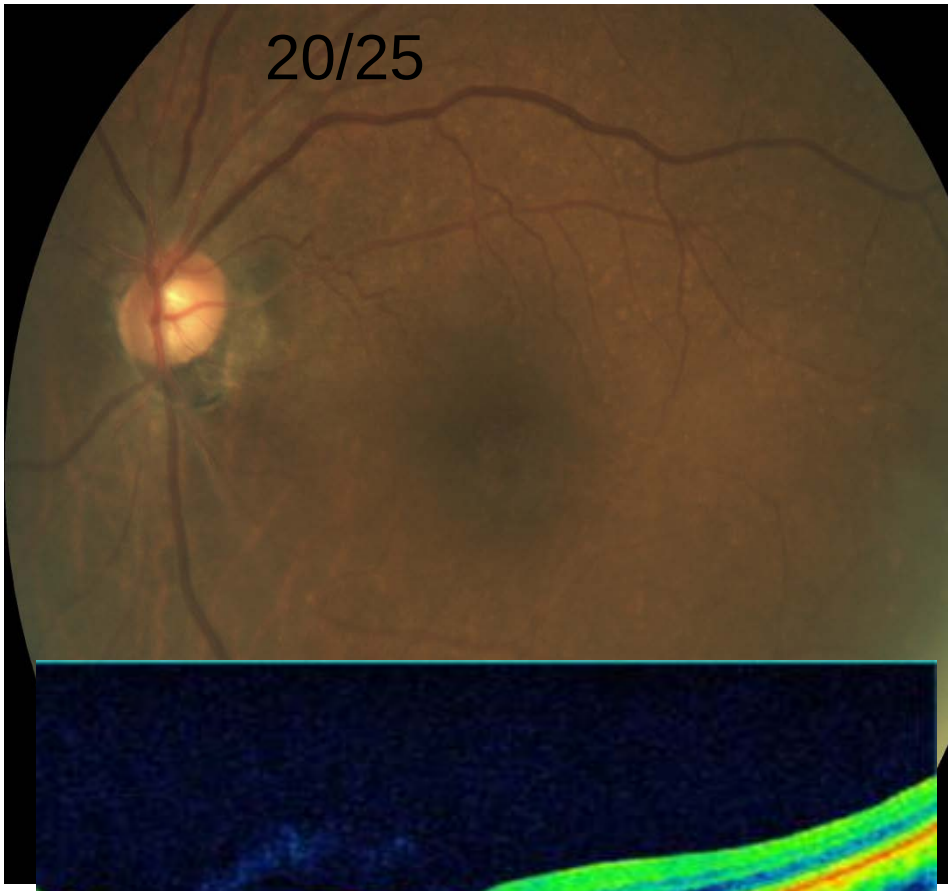
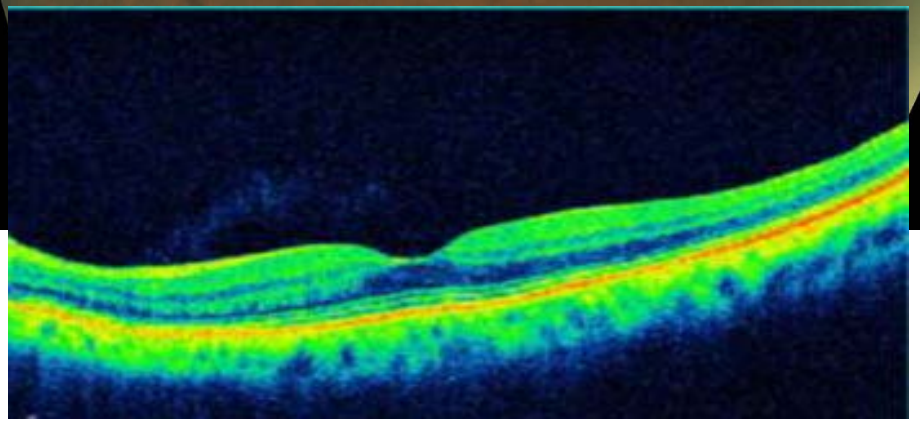
s/p Avastin injection x 1



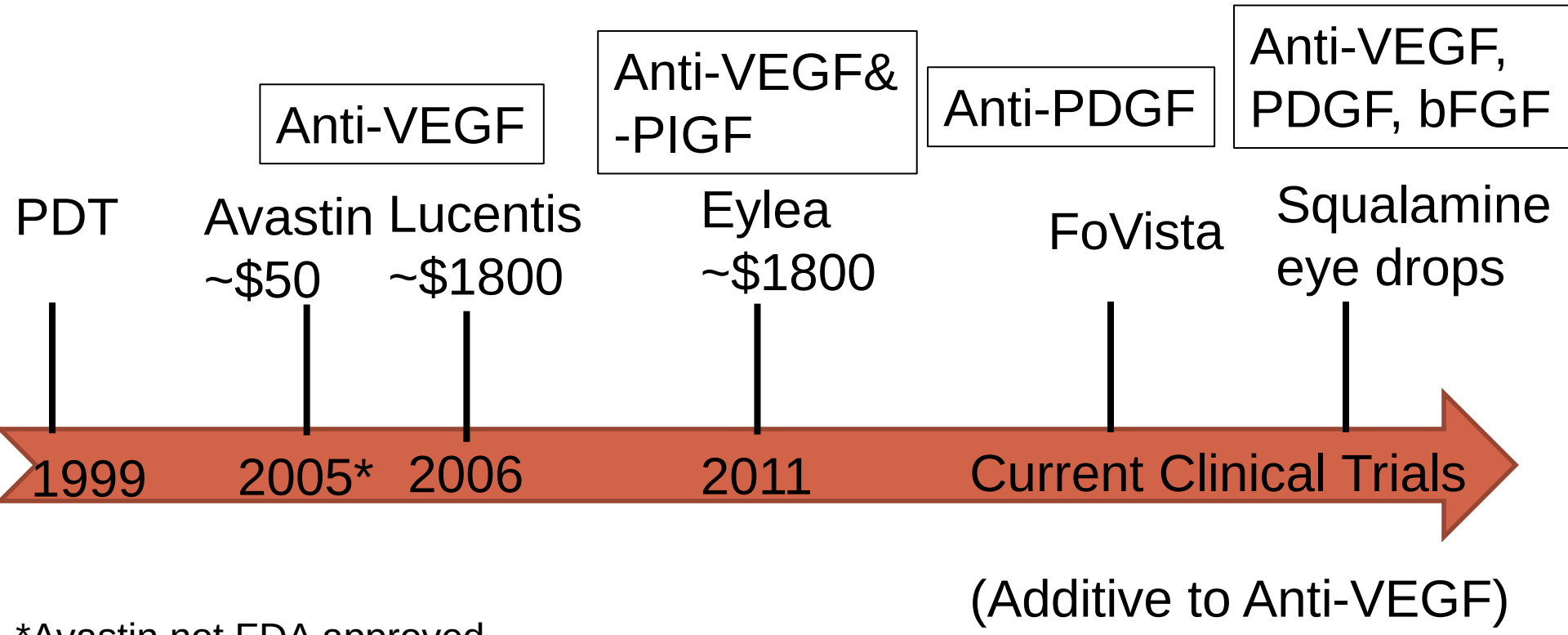






Exudative AMD – polypoidal variant

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



*Avastin not FDA approved

THANK YOU!!!!!

Glaucoma Update
Fall 2014 Continuing Education

Janice McMahon, OD, FAAO
Associate Professor of Optometry

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.

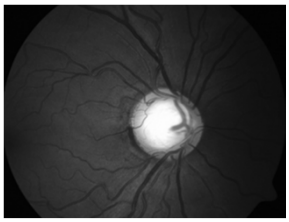
L: Alcon Laboratories, Carl Zeiss Meditec

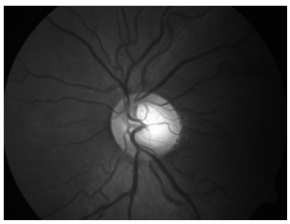
R: Akorn Pharmaceuticals

Case Presentation

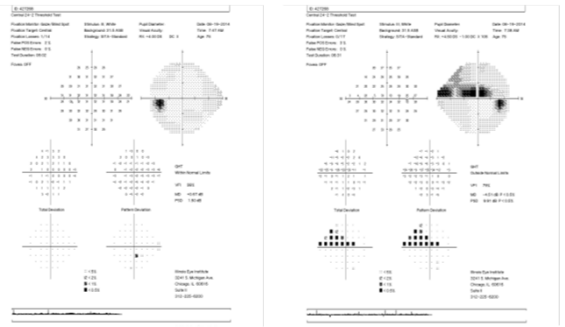
- 67 year old female
- Following for 3 years with early POAG
- IOP pre-treatment mid-20s
- Achieved high teens, OD>OS
- Single medication, prostaglandin qhs OU

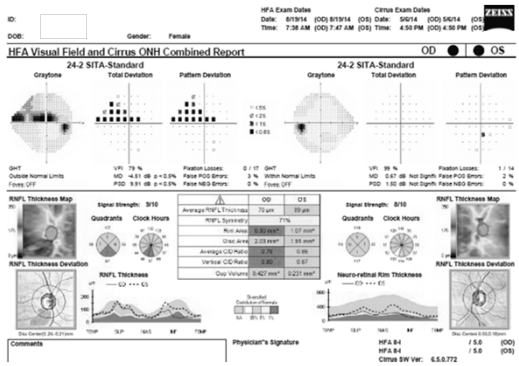
ONH





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	Disadvantages
• Non-invasive	• Side effects
• Better perceived by patient	• Dosing Schedule
• Efficacious	• 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_2-Adrenergic Agonists, β-Adrenergic Antagonists, and Topical Carbonic Anhydrase Inhibitors With Prostaglandin Analogs

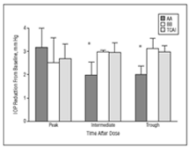
Angelo P. Tanna, MD; Alfred W. Rademaker, PhD; William C. Stewart, MD; Robert M. Feldman, MD

- 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 α_2-Adrenergic Agonists, β-Adrenergic Antagonists, and Topical Carbonic Anhydrase Inhibitors With Prostaglandin Analogs

Angelo P. Tanna, MD; Alfred W. Rademaker, PhD; William C. Stewart, MD; Robert M. Feldman, MD

- 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

John H. K. Liu, PhD, Felipe A. Medeiros, MD, PhD, J. Rigby Slight, MD, Robert N. Weinreb, MD

- 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

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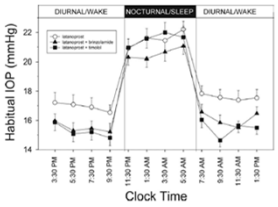


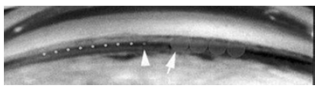
Effects of Systemic β-blocker Therapy on the Efficacy and Safety of Topical Brimonidine and Timolol

Joel S. Schuman, MD for the Brimonidine Study Groups 1 and 2

- Post-hoc evaluation of data from prospective clinical trials comparing brimonidine and timolol
- Timolol treated subjects concurrently taking systemic B-blockers experienced less IOP-lowering effect ($P \leq .041$)
  - 4.41 ± 0.51 vs. $6.23 \pm .18$ 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 aqeuous outflow facility



(Photo Courtesy of Mark Latina, MD)

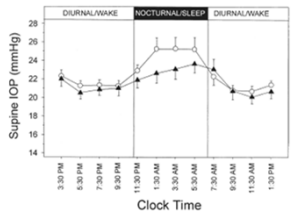
Effect of Topical Prostaglandin Analog Use on Outcome Following Selective Laser Trabeculoplasty

WARREN J. SCHERER

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

Effect of Laser Trabeculoplasty on Nocturnal Intraocular Pressure in Medically Treated Glaucoma Patients

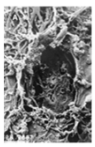
Alexander C. Lee, MD,[1] Sameh Mosaed, MD,[1] Robert N. Weinreb, MD,[1] Daniel F. Kripke, MD,[2] John H. K. Liu, PhD[1]



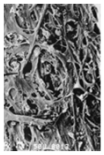
Which is better ALT or SLT?

- Similar efficacy[1]
- Similar safety profile[1]
- SLT repeatable[2], but ALT is not[3]

ALT



SLT



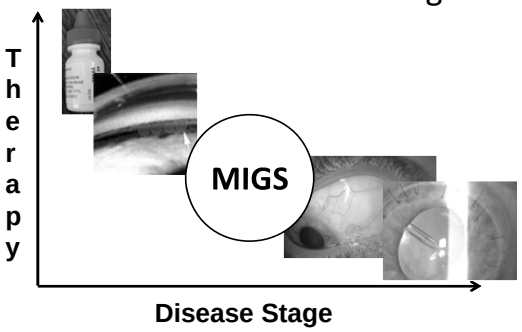
[1]Bovell AM, et al. Can J Ophthalmol. 2011;46:408-413.
[2]Riansuwan L, et al. Poster 77. AGS, 2007.
[3]Richter CU, et al. Ophthalmology. 1987;94(9):1085-9.

Microinvasive Glaucoma Surgery

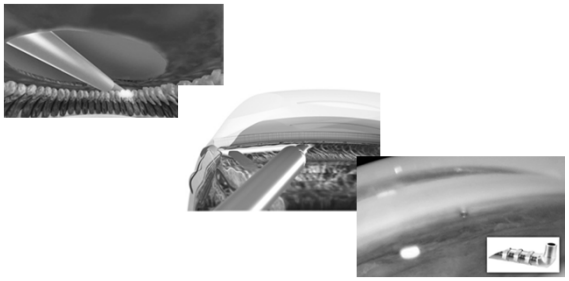
- Ab interno microincisional approach
- Minimally traumatic to target tissue
- At least modest IOP-lowering efficacy
- High safety profile
- Rapid recovery with minimal impact on quality of life

Saheb H, Ahmed II. Curr Opin Ophthalmol 2012; 23:96-104.

Glaucoma Treatment Paradigm

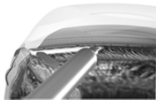


FDA-Approved MIGS Procedures



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

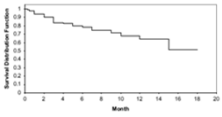


Trabectome Video

Combined cataract extraction and trabeculotomy by the internal approach for coexisting cataract and open-angle glaucoma: Initial results

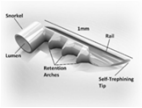
Brian A. Francis, MD, MS, Don Minckler, MD, MS, Laurie Dustin, Shahem Kawji, MD, Jason Yeh, MD, Arthur Sit, MD, Sameh Mosaed, MD, Murray Johnstone, MD, and the Trabectome Study Group

- 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



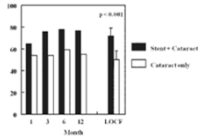
- FDA approved in 2012
  - Indicated for treatment of mild to moderate glaucoma in conjunction with cataract surgery

iStent video

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

Thomas W. Samuelson, MD,[1] L. Jay Katz, MD,[2] Jeffrey M. Wells, PharmD,[3] Yi-Jing Duh, PhD,[4] Jane Ellen Giamporcaro, BS,[5] for the US iStent Study Group*

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



Ophthalmology 2011;118:459-467.

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

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