



# Loss of Characteristics in PCV on B Scan OCT After Antiangiogenic Therapy: Differentiation Between PCV and Typical AMD and Treatment Implications

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# Disclosures

- Research Support: Genentech, Regeneron, Salutaris Medical Devices
- Consultant: Regeneron, Genentech, Bayer, Bausch & Lomb, Santen, Iveric, Allergan, Zeiss
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- No Personal Financial Interests in Any Exudative AMD Treatments or Ophthalmic Treatments

# Summary

- Polypoidal choroidal vasculopathy (PCV) is a subtype of neovascular age-related macular degeneration (nAMD) with a high prevalence of anti-VEGF resistance.
- Indocyanine green angiography (ICGA) is the gold standard for PCV diagnosis, but is often not available
- B scan OCT is widely used in nAMD diagnosis showing inverted U-shaped elevations of the RPE corresponding to the hyperfluorescent polypoidal lesions on ICGA in eyes with PCV
  - Inverted U shaped RPE elevation
    - 57% of eyes with PCV on B scan OCT prior to any Rx
    - 25% of eyes with PCV after 6 to 9 months of x-VEGF injections
    - Lesson – Look at baseline OCT not recent after Rx OCT in trying to diagnose PCV in anti-VEGF resistant cases of nAMD
- Diagnosis of PCV by B scan OCT may affect Rx decisions, especially in eyes poorly responsive to standard of care anti-VEGF injections

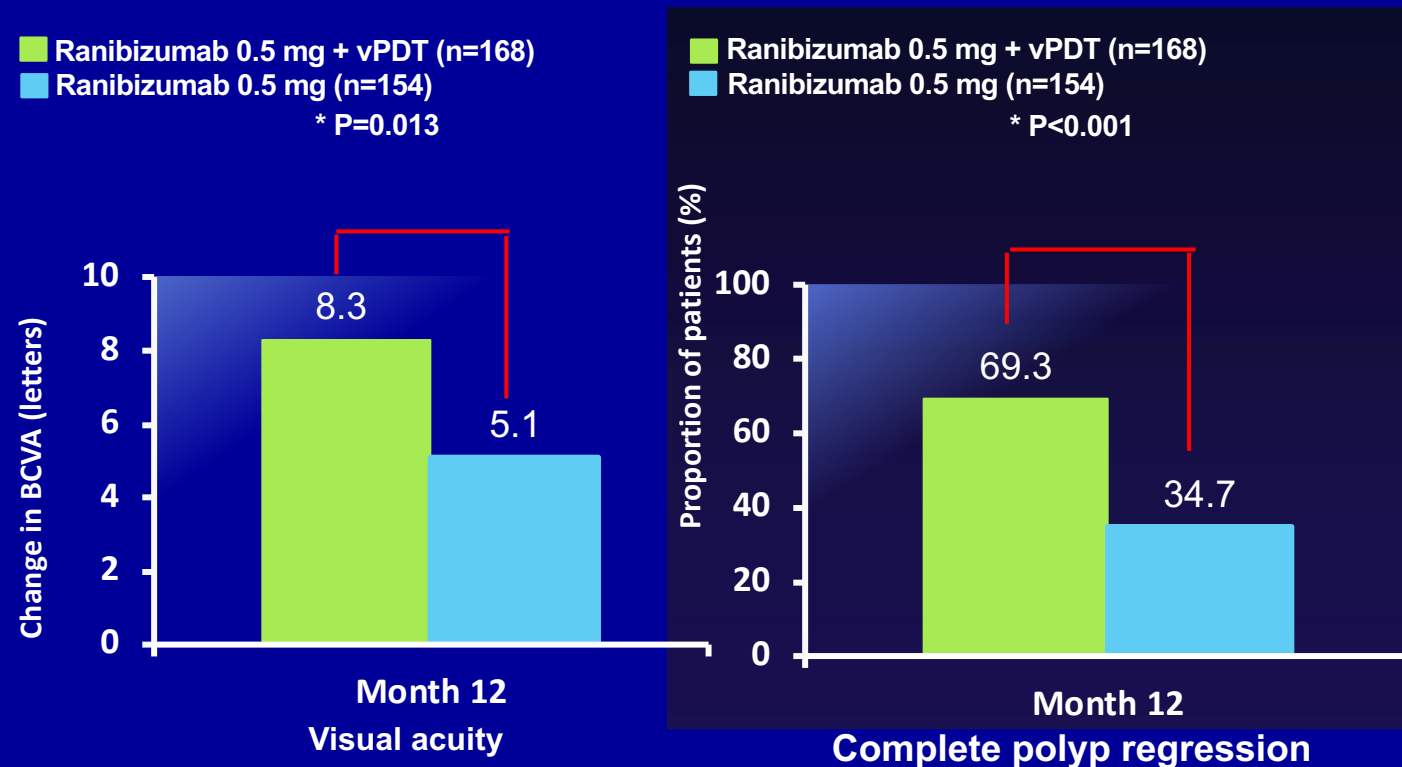
# Polypoidal Choroidal Vasculopathy (PCV)

- Aneurysmal Subretinal Neovascularization
- Best Diagnostic Technique – ICGA with SLO
- Alternative techniques – B scan OCT, En Face OCT, OCT angiography, Fundus Camera ICGA
- Most Important Subtype of CNV to Identify
  - Higher Anti-VEGF resistance
  - Alternative therapy with combination PDT
    - Better vision with less treatment than anti-VEGF monoRx
    - EVEREST II – 2 year results – JAMA OPHTHALM 2020

# Everest II

## Ranibizumab + vPDT > Ranibizumab Monotherapy

BCVA change from baseline to M12 & 24    Complete polyp regression at M12 & 24



Month 24 – 9.6 versus 5.5    **BETTER** Vision

**BETTER** Anatomic Results Month 24 – 56.6 versus 26.7

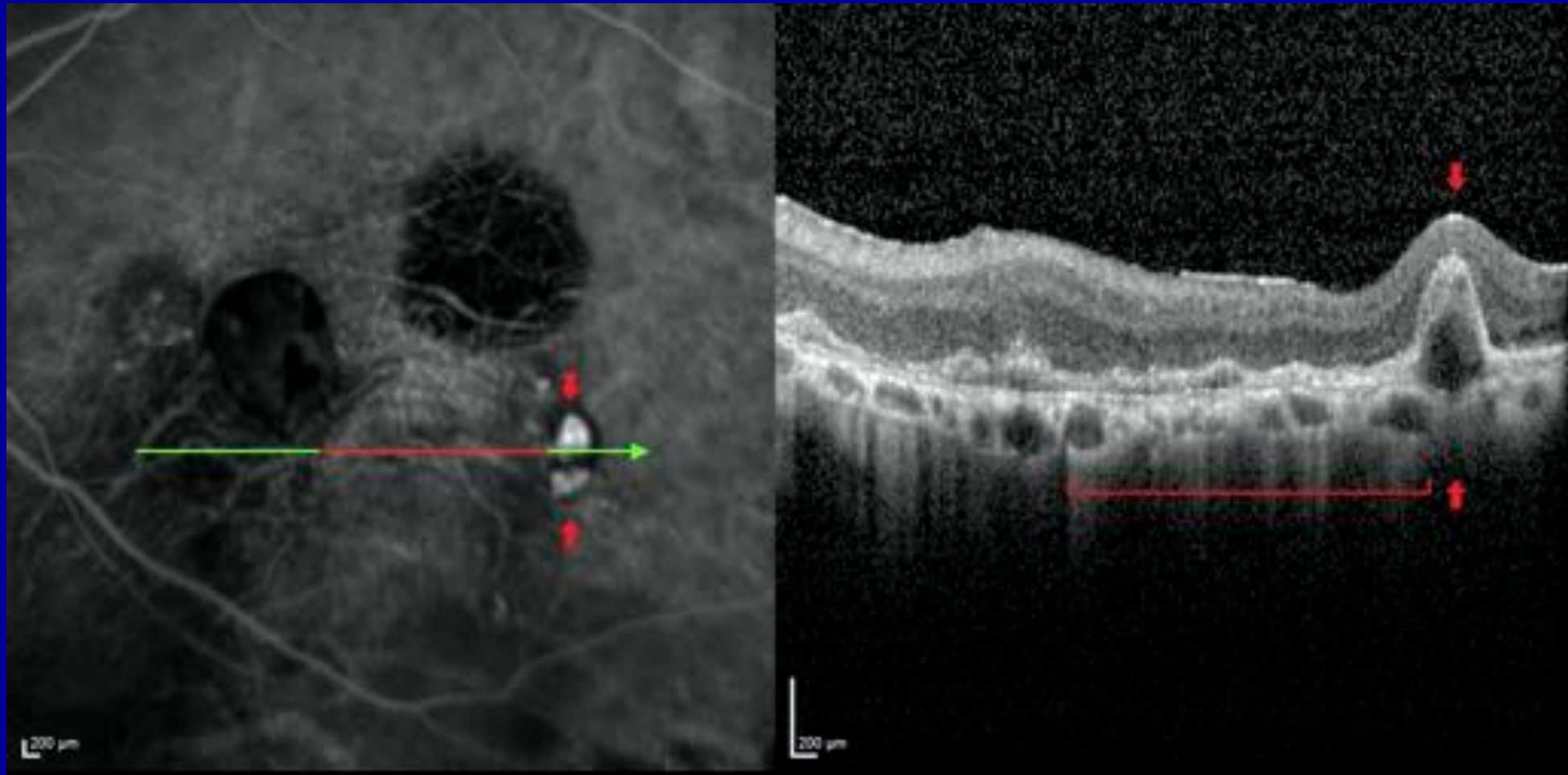
**LESS** Treatment - ½ the number of injections with combination Rx

## Inverted U-shaped on B scan OCT

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- Correspond to polypoidal lesions noted on ICGA
- Differentiated by sharply elevated walls versus more gentle sloping walls of RPED
- Sometimes associated with ring-shaped lesion within the elevated inverted U-shaped lesion





*Red line – branching vascular network (BVN) – shallow elevation of RPE above Bruch's membrane – “double line sign”*

*Red Arrows – polypoidal lesion – focal higher elevation (inverted U-shape) of RPE above Bruch's membrane with steep sides*

# Inverted U-shaped Polypoidal Lesion

Polypoidal Lesion above RPED

Multiple Polypoidal Lesions

One Large Polypoidal Lesion with Subretinal Fluid  
And Macular Cystic Changes





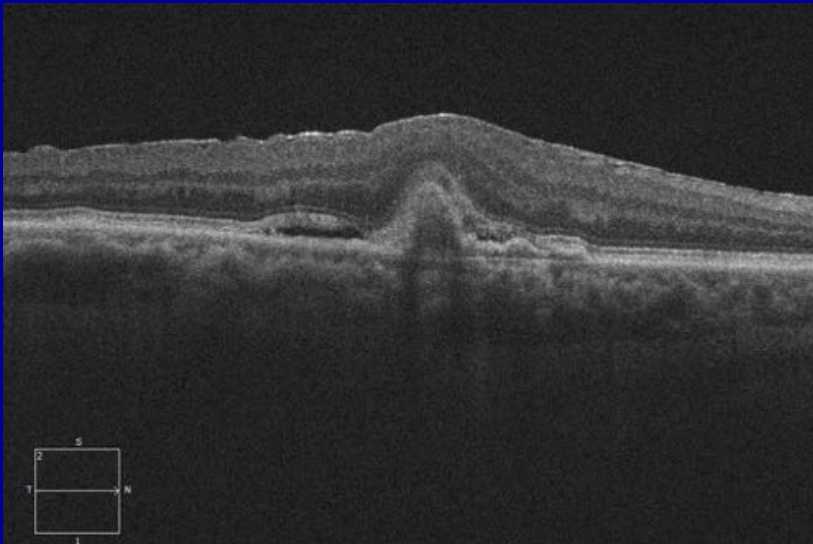
# Retrospective Study

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- 112 eyes of 106 patients
- All had ICGA and corresponding OCT
- 69 PCV - 43 typical AMD
- More subretinal fluid in PCV than typical AMD
- No difference in SHRM, RPED, macular edema
- PCV eyes – 57% with inverted U-shaped lesion

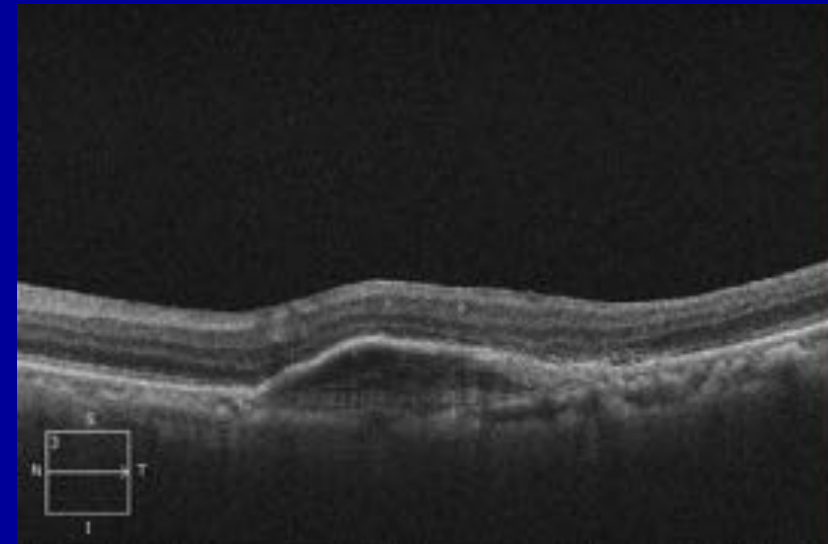
# Inverted U-shaped Lesion vs RPED

**Inverted U-shaped Lesion  
PCV**



- Steep, vertical walls
- Sharply peaked protrusion of RPE with heterogeneous reflectivity

**RPED  
Typical AMD**



- Gradual, sloping walls
- Serous, hemorrhagic or fibrotic

# Inverted U-shaped Lesion

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- Decreased from 57% to 25% after anti-VEGF therapy for 6-9 months
- Ability to make diagnosis of PCV on B scan OCT goes down after anti-VEGF Rx
- Must look at Pre-Rx B scan OCT in nAMD to have best chance of making PCV diagnosis on OCT B-Scan alone

# ICG - Guided PDT for PCV

A Potentially Better Treatment than Anti-Angiogenic Therapy For  
This Subtype of Wet AMD

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Retina Consultants of Hawaii

Hawaii Macula & Retina Institute



**The Retina Center At Pali Momi**



# Technique in Performing PDT for PCV Based on ICG angiography

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- ICG angiogram of the PCV complex guides therapy -- NOT FA
- Spot size limited to exact PCV lesion size or slightly larger (300 um) than PCV complex
- Combination therapy with PDT/IVA/Dex (my preference) or PDT/x-VEGF
- Avoiding fovea with PDT spot size if possible
- Reduced Fluence (if fovea included & VA good)
- Full Fluence (if VA less than 20/50 or fovea not included in spot size)

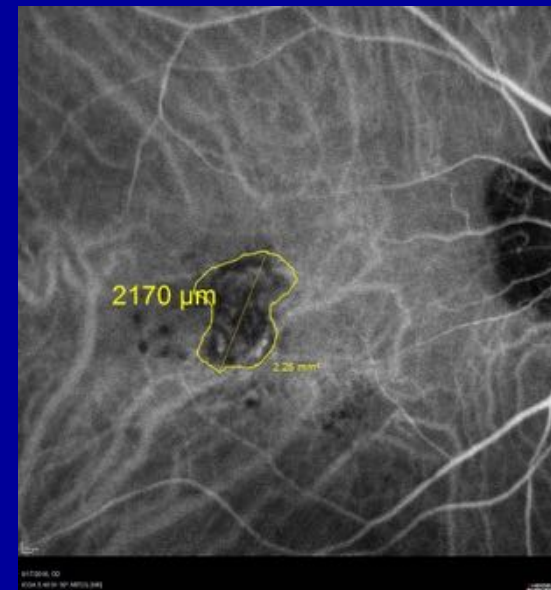
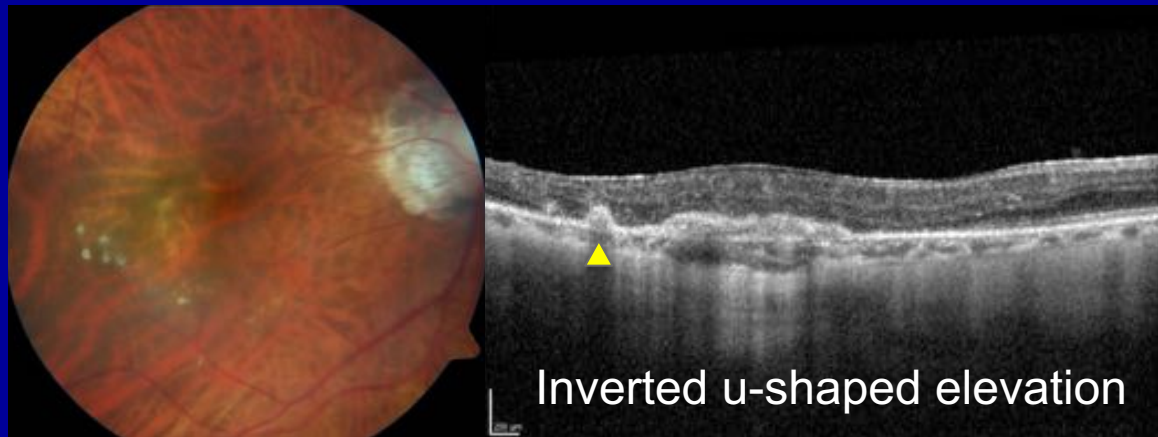


# Combination PDT for Anti-VEGF Resistant PCV

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- 96 year old male
- Visual Acuity 20/40
- Vascularized RPED, SRF, Macular Edema
- Occult leakage on FA
- Intravitreal aflibercept injections monthly but persistent disease activity with subretinal fluid

# S/P Monthly Aflibercept



PCV Complex On ICGA:  
ICGA used for  
PDT Spot Size

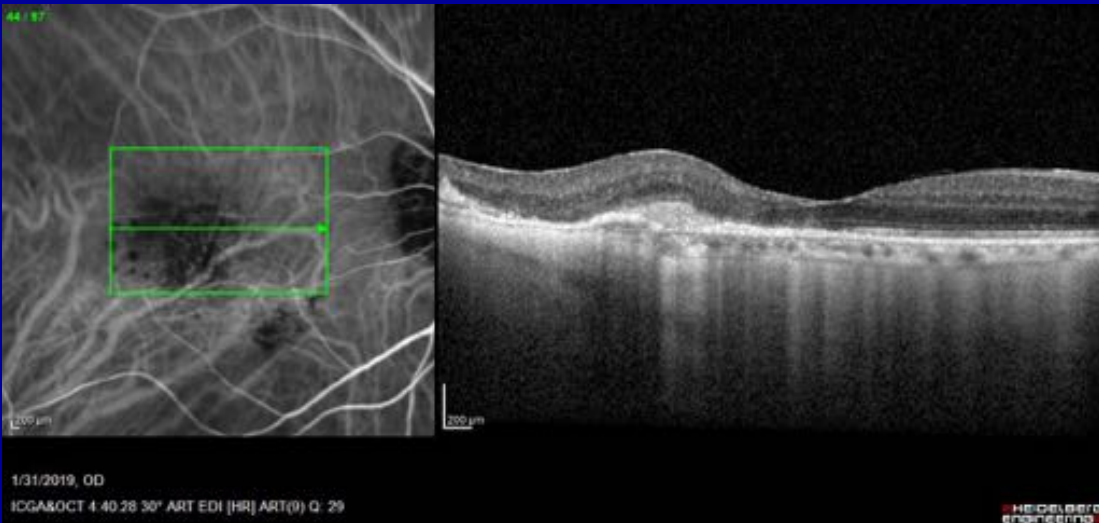


Occult leakage on FA

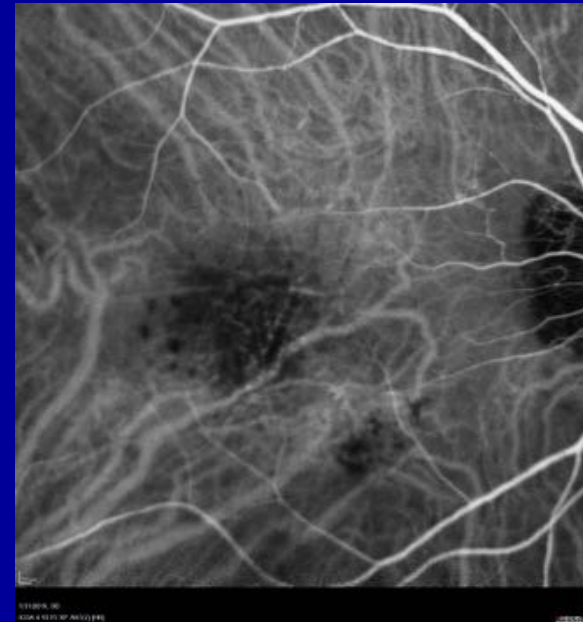
Macular edema and SHRM and Cystic Changes on OCT

# S/P PDT x2 Q 3 months

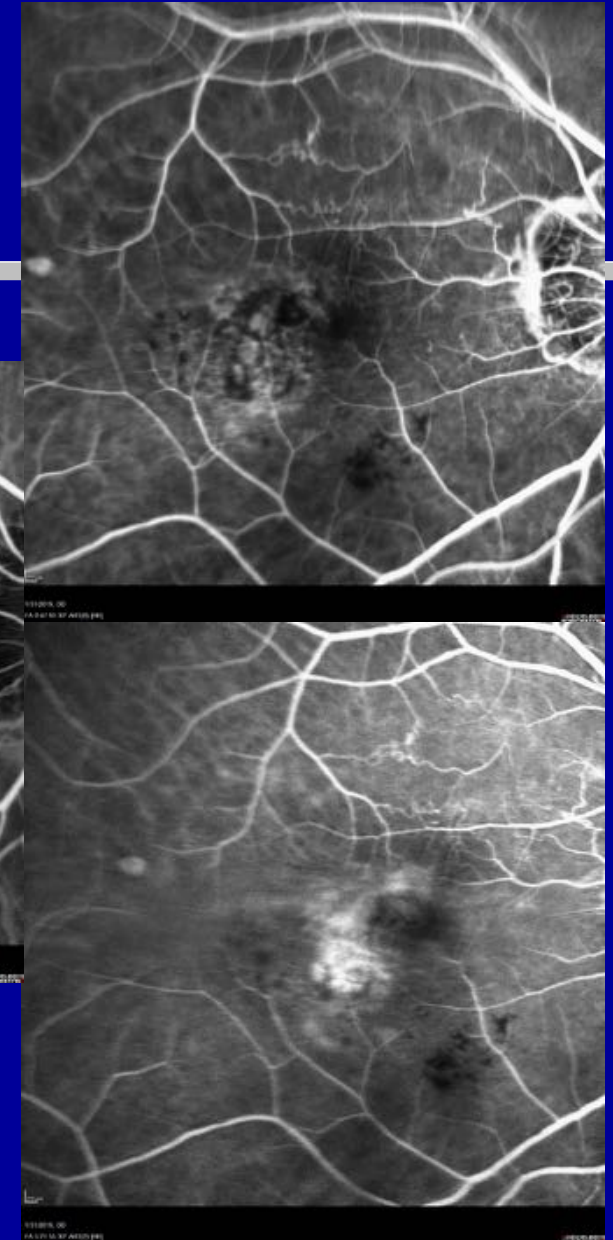
- Visual acuity - 20/40  
Now stable on Aflibercept Q 3 months
- Previously Q 4 weeks  
With persistent disease activity



Resolution of RPED and macular edema



Decreased PCV Complex  
on ICGA



Resolved Superior Occult  
Leakage Inferior Stain

# B Scan OCT For PCV Diagnosis

- **PCV** - The most clinically important subtype of wet AMD to identify because associated with **resistance to anti-VEGF** – current standard of care
- **Inverted U-shaped lesion** – 57% of PCV eyes
- **Loss** of Inverted U-shaped lesion **after anti-VEGF Rx** to 25%
- Look at baseline B scan OCT prior to Rx
- Consider **combination PDT and anti-VEGF**
  - Better vision (75% more letter increase)
  - ½ the number of injections (EVEREST II, JAMA 2020)