

# RPE Detachment in AMD: Injection Index May Predict Long Term Visual Outcomes



Stein Eye Institute



**DOHENY**  
EYE INSTITUTE

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Sponsor: Steven Schwartz, MD

53<sup>rd</sup> Annual Scientific Meeting  
Retina Society 2020 VR

# Disclosures

I have no financial disclosures to report.

# Key points

- Largest PED/AMD cohort and longest follow-up reported to date
- **Injection index** = # of injections / year
- Statistical analysis of data from this large, retrospective cohort suggests clinically significant findings
  - High cumulative injection index may yield improved visual outcomes at 4 and 5 years in patients with PED/AMD
  - Patients may gain an additional 0.5 ETDRS letters per injection per year

# Anti-VEGF: transformative treatment paradigm AMD

Most patients lose vision after a period of relatively regular treatment  
The “under-treatment paradox”

Decreased treatment frequency and duration

Fewer injections over time

- Treatment burden
- Non-compliance
- Treatment strategies (treat and extend or prn)
- Socio-economic issues
- Anatomic and functional disease progression



# Hypothesis: Injection Index

- A simplified quantification of treatment frequency, injection index (ii), defined as the number of anti-VEGF injections per year from the time of presentation, may provide a useful means of evaluating real world data irrespective of treatment strategy, anti-VEGF agent, or other confounding variables.
- If validated, injection index may become a useful means of discussing and investigating treatment regimens across all diseases treated with VEGF suppression.

# RPE Detachment in Neovascular AMD

1. Traditionally thought to have **poor prognosis**
2. Typically excluded from major prospective trials given “poor prognosis”
  - “Difficult to treat,
  - Resistant to anti-VEGF, (persistent fluid)
  - Unsatisfactory response”
  - RPE Tears (0-27%)
  - Atrophy post treatment
  - Disciform scar formation
3. Literature suggests: Best Review: Sarraf:RETINA:November 2018 (38;11)
  - **Under appreciated:** greater than 60% of eyes treated with AMD
  - Post hoc large trials, retrospective studies, prospective trials with low numbers of eyes and follow up 2 years or less
  - No agreement on treatment regimen, agent, ideal anatomic outcomes as they relate to vision
  - **“Treatment goals for patients presenting with PED should focus on visual acuity”**

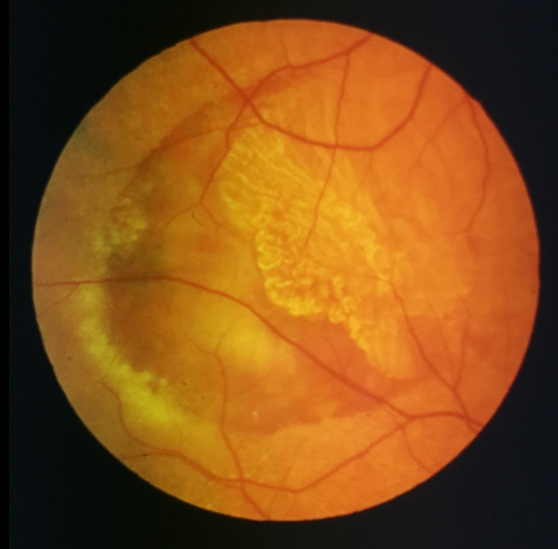


Image courtesy of Alan Bird

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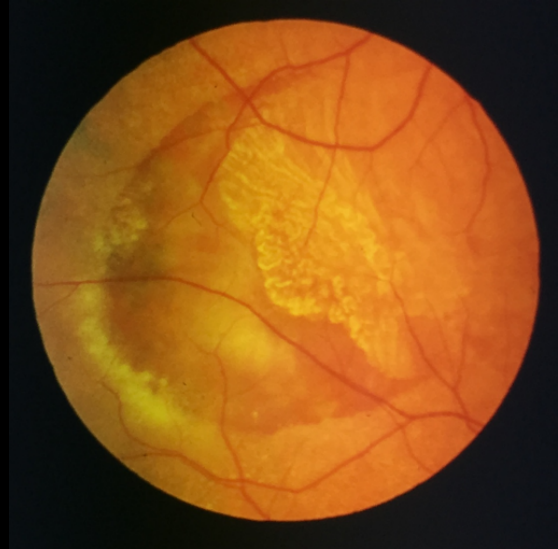
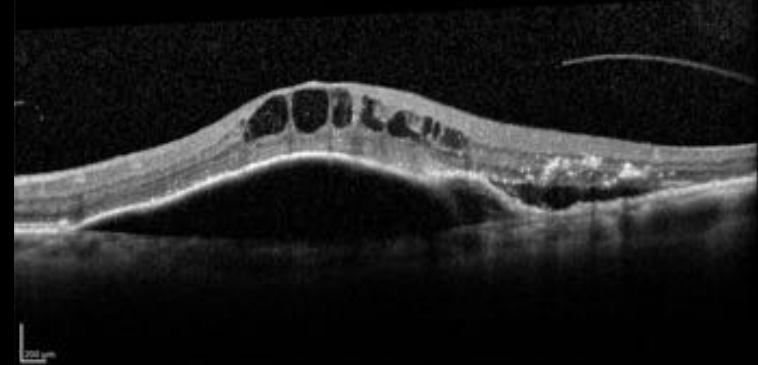


Image courtesy of Alan Bird

# PED /AMD



## Retrospective Analysis

256 eyes UCLA / Tel Aviv

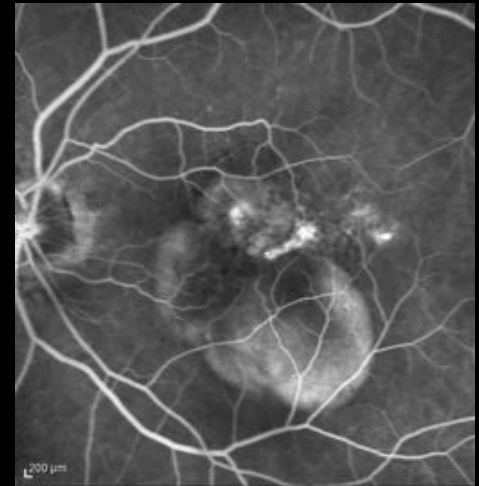
5 Year follow-up (1.04-12.74 years)

Vision outcomes by injections/year “Injection Index”

Anti-VEGF agent agnostic

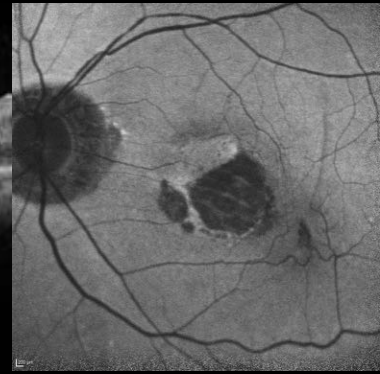
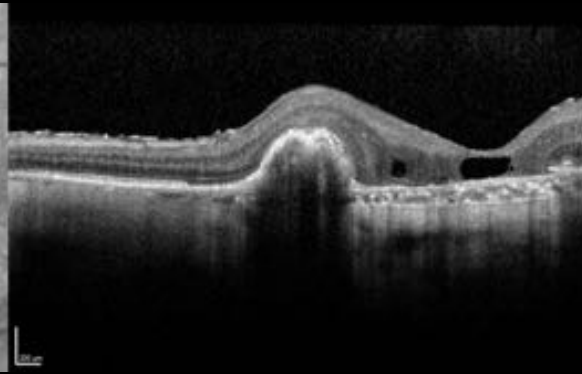
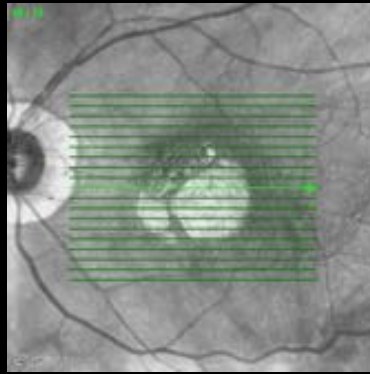
Baseline anatomy, demographics balanced

RPE Tears at baseline excluded





# Methods



## Inclusion criteria:

- PED with AMD
- >100 micron PED
- 1 year follow-up

## Excluded:

- Baseline RPE tears
- PCV, other retinal diseases
- LP or worse vision

## Groups:

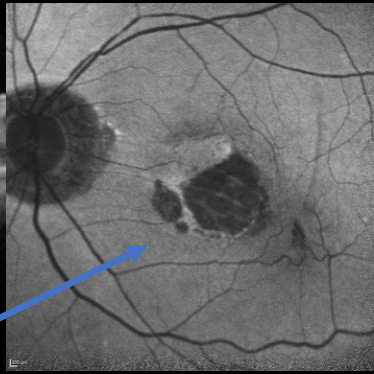
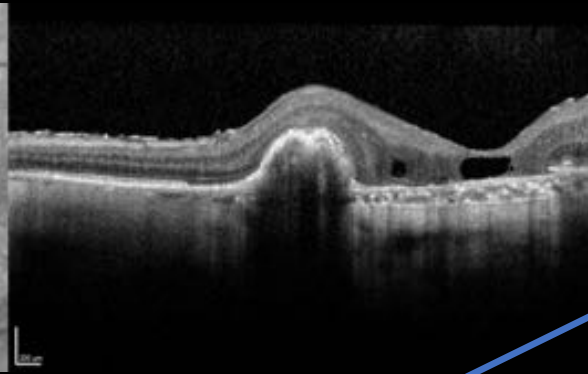
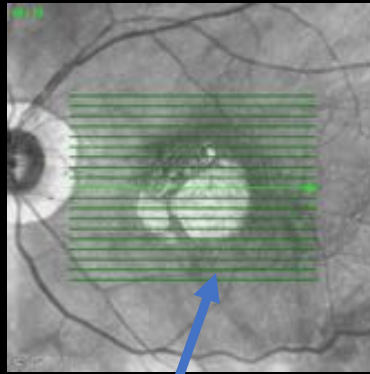
*High ii ( $\geq 9$  injections)*

*Low ii ( $< 9$  injections)*

## Analysis:

If patient changed groups,  
remaining visits were excluded

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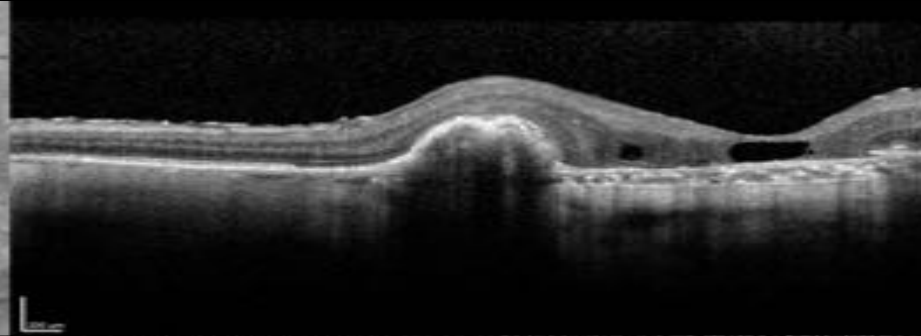
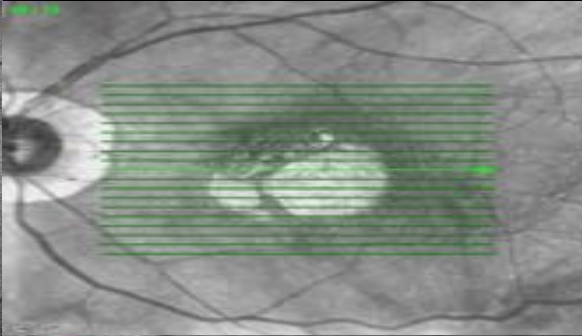
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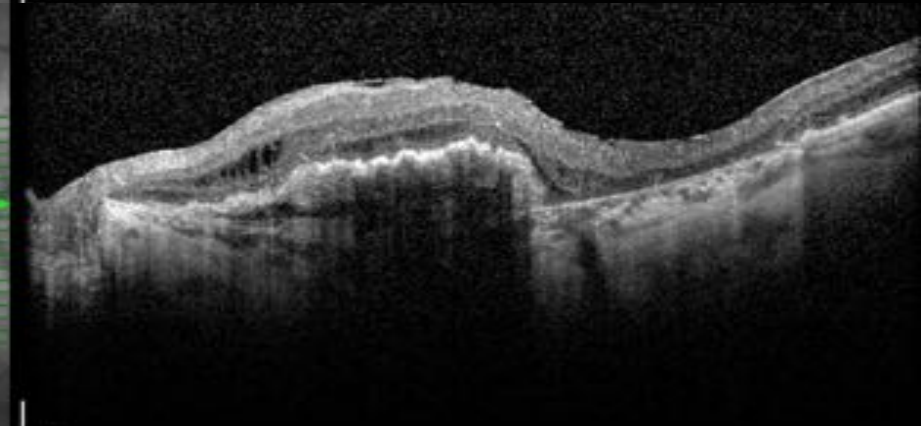
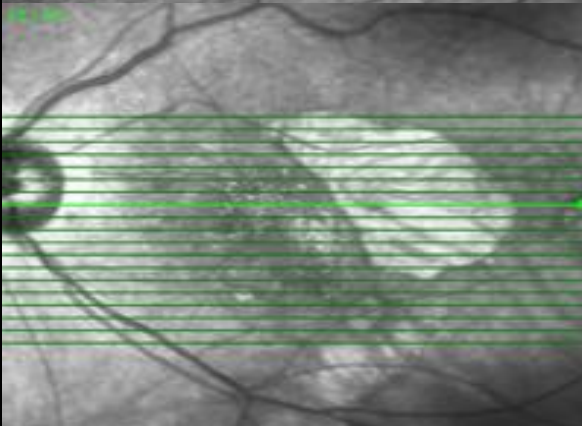
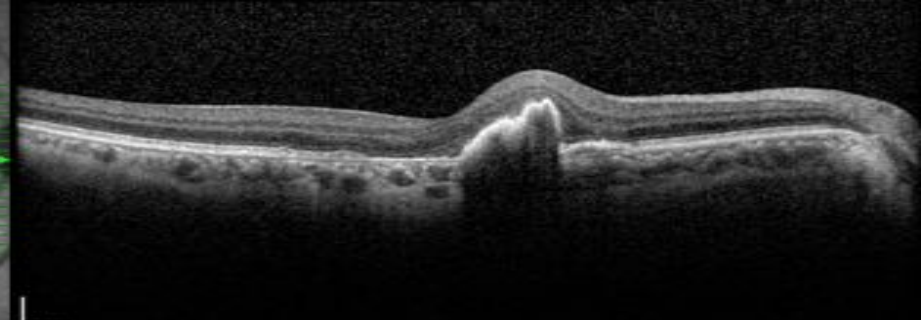
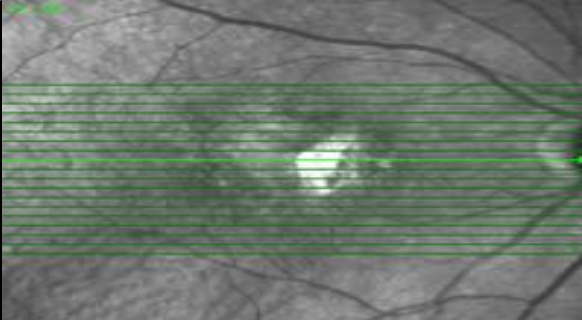
Low ii ( $< 9$  injections)

## Analysis:

If patient changed groups,  
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EXAMPLES OF  
RPE TEARS  
EXCLUDED  
AT  
BASELINE



# Demographics

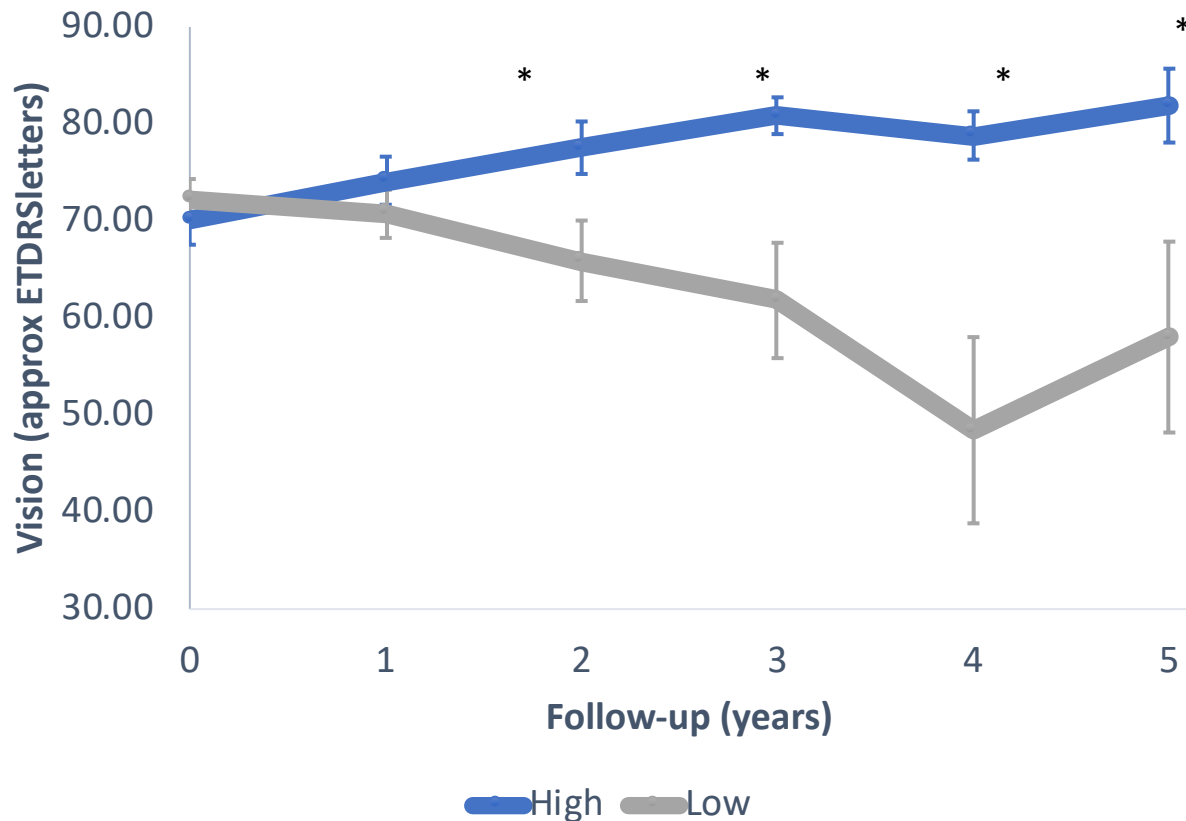
	Injection Index (ii)		P Value
	High ( $\geq 9$ ) (N=130)	Low ( $< 9$ ) (N=126)	
Age (years)	78.3	78.1	0.80
Gender (Female, %)	59%	64%	0.41
Eye (OD, %)	55%	48%	0.26
Baseline Vision (Snellen)	20/80	20/73	0.53
Baseline PED Height (Microns)	327.1	280.6	0.05
Treatment Naïve (%)	73%	87%	0.005

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# Vision by Injection Index over 5 Year Follow-up

Injection Index (ii) Group	N (#)
High	130
Low	126



25 ETDRS letters (>3 lines)

\* Indicates  $p < 0.05$

# Change in vision per injection

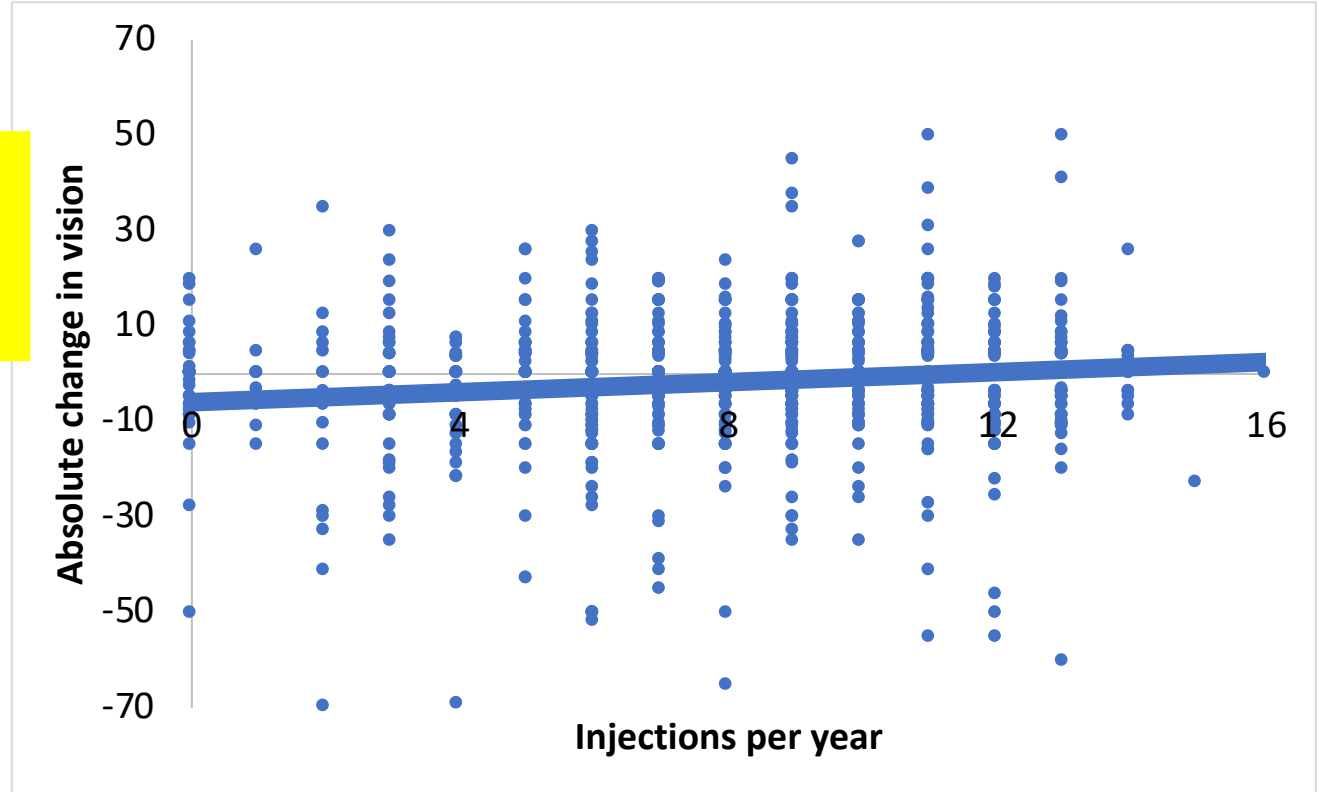
**Linear Regression**  
**Slope = 0.5**

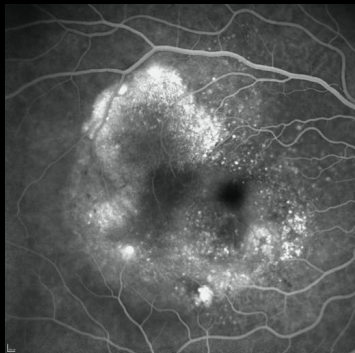
**0.5 ETDRS letters  
per injection per**

For example:

6 more injections / year =  
3 letters / year  
15 more letters in 5 years

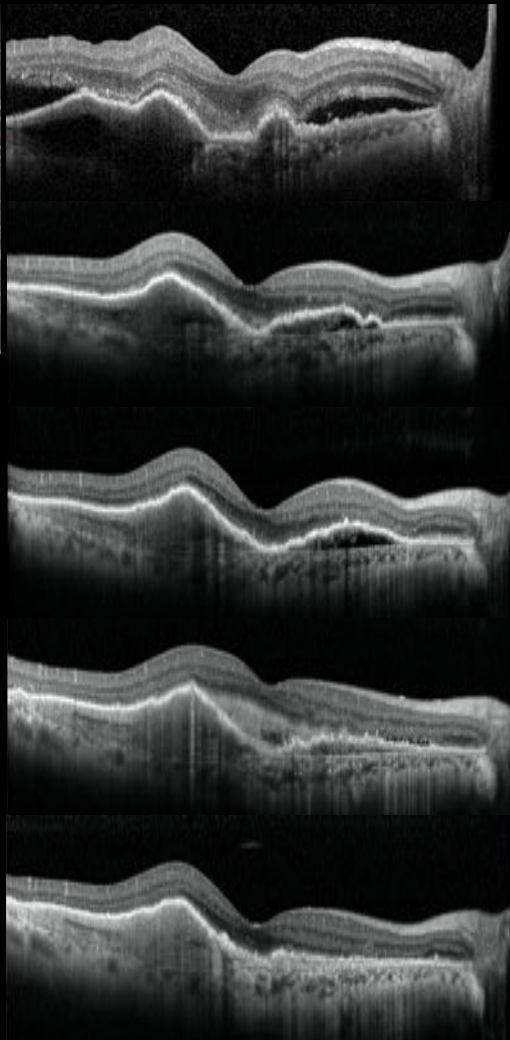
Suggesting 15 more letters  
in patients treated with 12  
injections vs. 6 injections  
over 5 years.





# Example Case

(No indication of pachychoroid disease)



2010 20/40

12

2011 20/30

12

2012 20/40

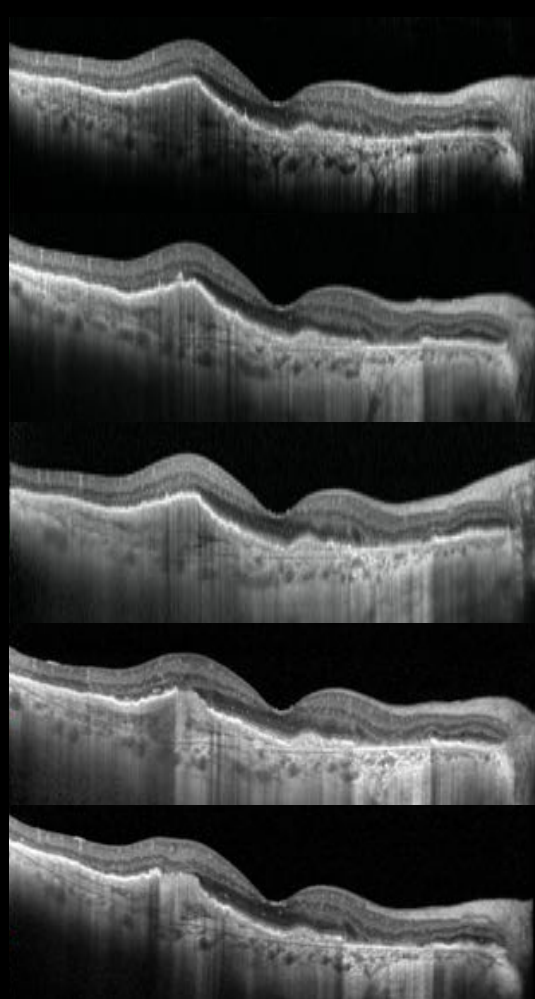
11

2013 20/40

12

2014 20/60

12



2015 20/40

10

2016 20/50

11

2017 20/50

10

2018 20/40

11

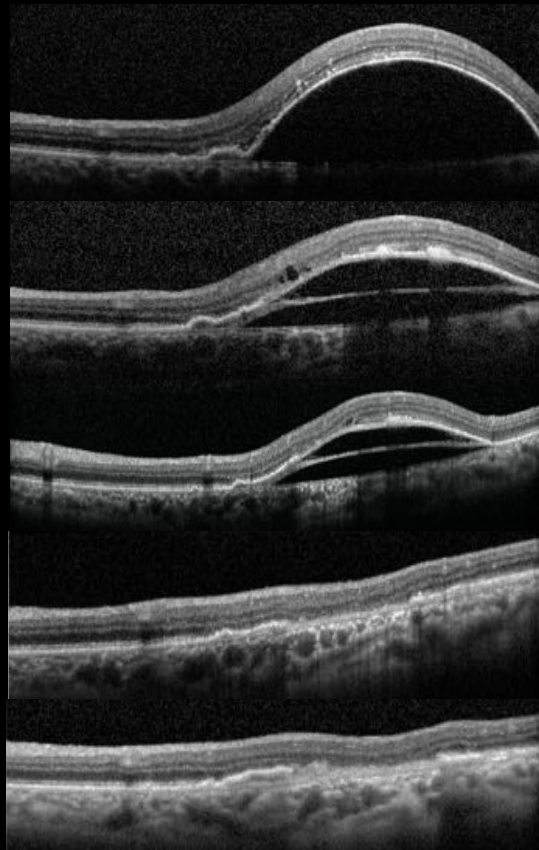
2019 20/50





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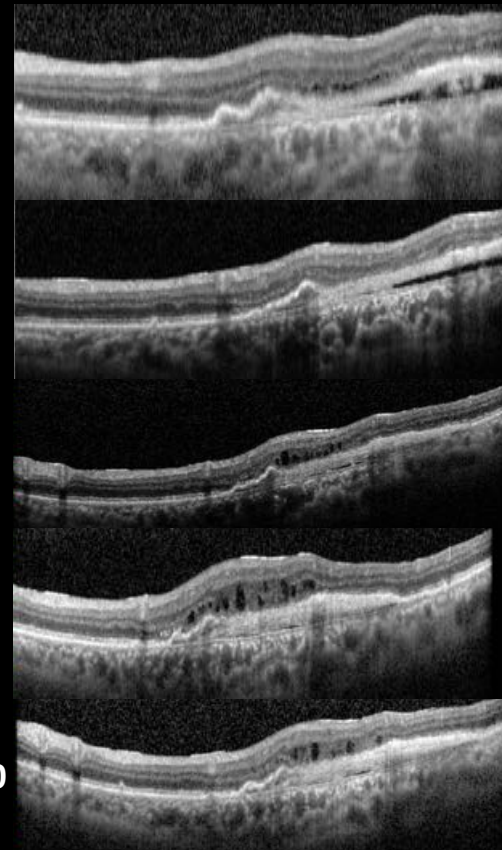
13

2013 20/50

13

2014 20/60

12



2015 20/50

7

2016 20/70

7

2017 20/70

7

2018 20/80

7

2018 20/80

# Rates of Complications

- Total number of injections = 9824
- Number of endophthalmitis = 1
- Rate = 0.01%
- Number of new RPE tears = 0

# Summary

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- Statistical analysis of data from this large, retrospective cohort suggests clinically significant findings
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# Thank You

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