Memorial Sloan Kettering Cancer Center

Ophthalmology Times Research Scholar Honoree Program

Icahn School of Medicine at Mount Sinai

Fundus Autofluorescence Patterns Before and After Treatment for Primary Vitreoretinal Lymphoma

Ethan K. Sobol, MD (Resident, PGY4)

Icahn School of Medicine at Mount Sinai, New York, NY

November 5th, 2020

MJH life sciences

FINANCIAL DISCLOSURES:

Grant Support: The Manhattan Eye Foundation

I will discuss the use of off-label medications

No relevant financial relationships with commercial interests

MY ROLE IN THIS RESEARCH:

☒ Conception and design of the work/project
☒ Acquisition of data
☒ Analysis and interpretation of data
☒ Creation and/or critical review of the presentation

Purpose

- To evaluate the clinical utility of fundus autofluorescence (FAF) imaging in monitoring disease activity in eyes with primary vitreoretinal lymphoma (VRL).
- Multimodal imaging findings in VRL are diverse, and only a few studies have focused on identifying FAF characteristics in this condition.

Methods

- Retrospective chart review at Memorial Sloan Kettering Cancer Center identifying eyes with VRL that underwent treatment
  - Eyes with adequate fundus, FAF, and OCT imaging before and after treatment
  - Relevant clinical characteristics and demographics
- FAF patterns were analyzed and categorized as to whether findings correlated with disease activity, by comparing the appearance before and after treatment.

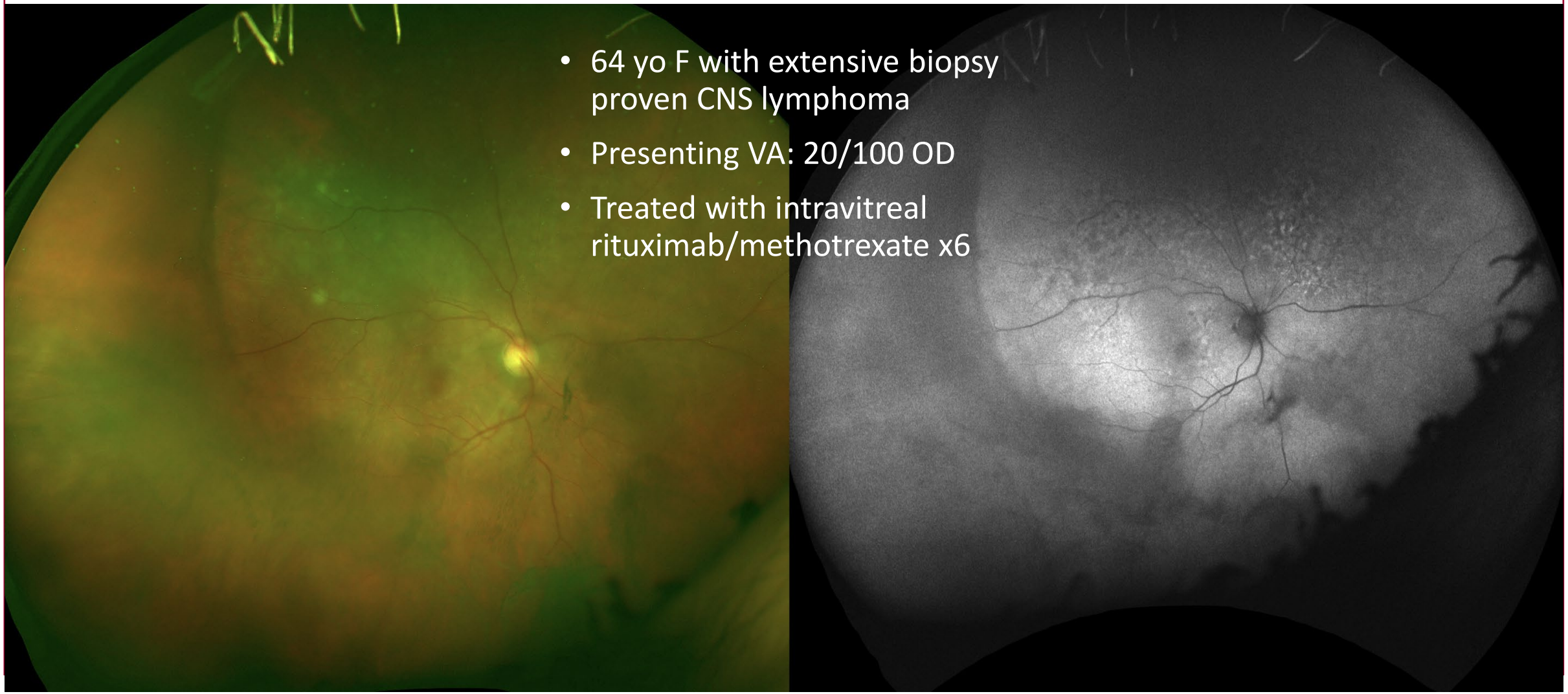
Results

- 23 eyes of 18 patients
  - Mean age: 61 years
  - Female: 10 (56%)
  - Disease recurrences: 3/23 (13%)
- Eyes were treated with intravitreal rituximab and methotrexate, external beam radiation, or systemic chemotherapy

Results

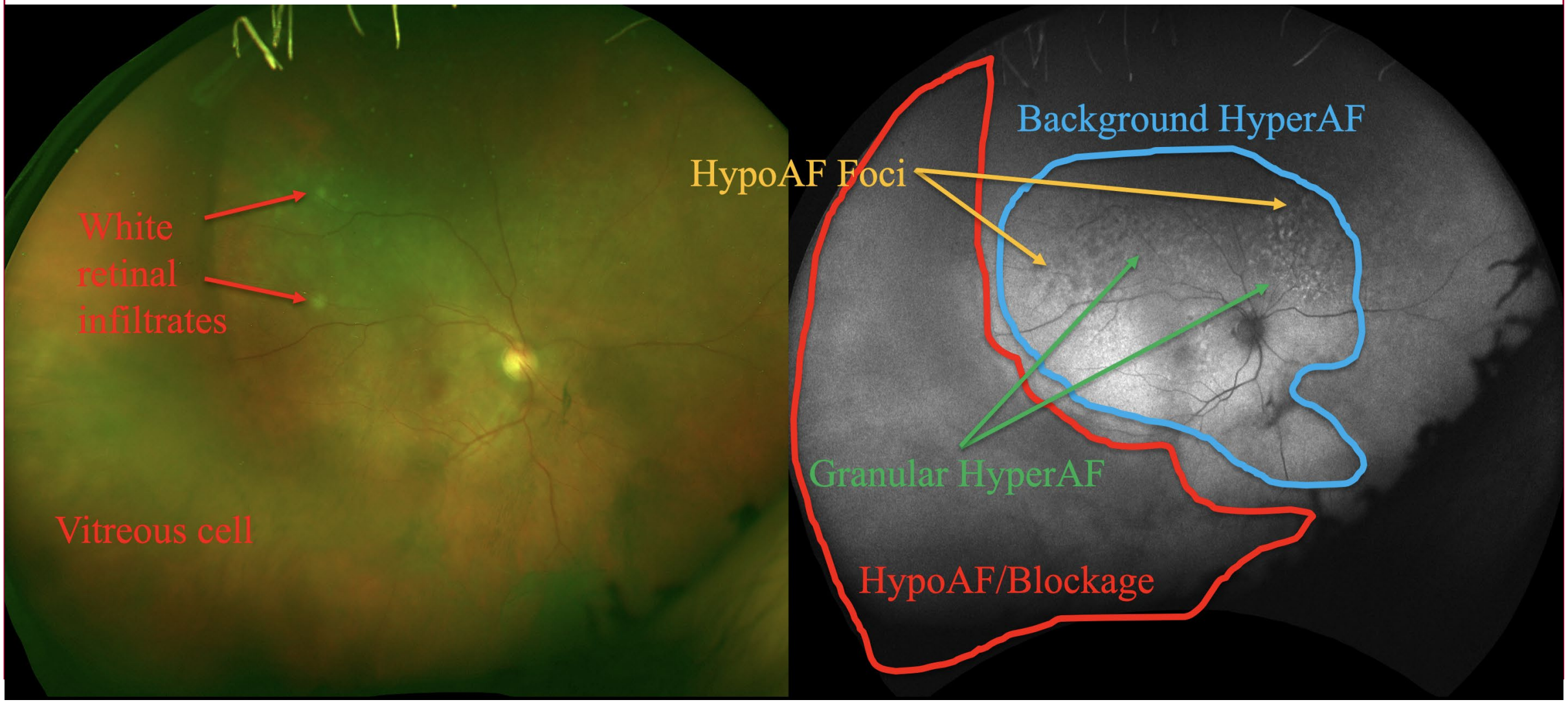
- An abnormal FAF pattern was identified in 13 of 23 eyes (57%), of which 11 of 13 (85%) were deemed to correlate with active disease.
  - **A “Granular Pattern” was present at baseline in 9 of 13 eyes (69%)**
- FAF abnormalities extended beyond the posterior pole into the periphery in 8 of 13 eyes (62%).

Example Case: Granular Pattern (n=9)

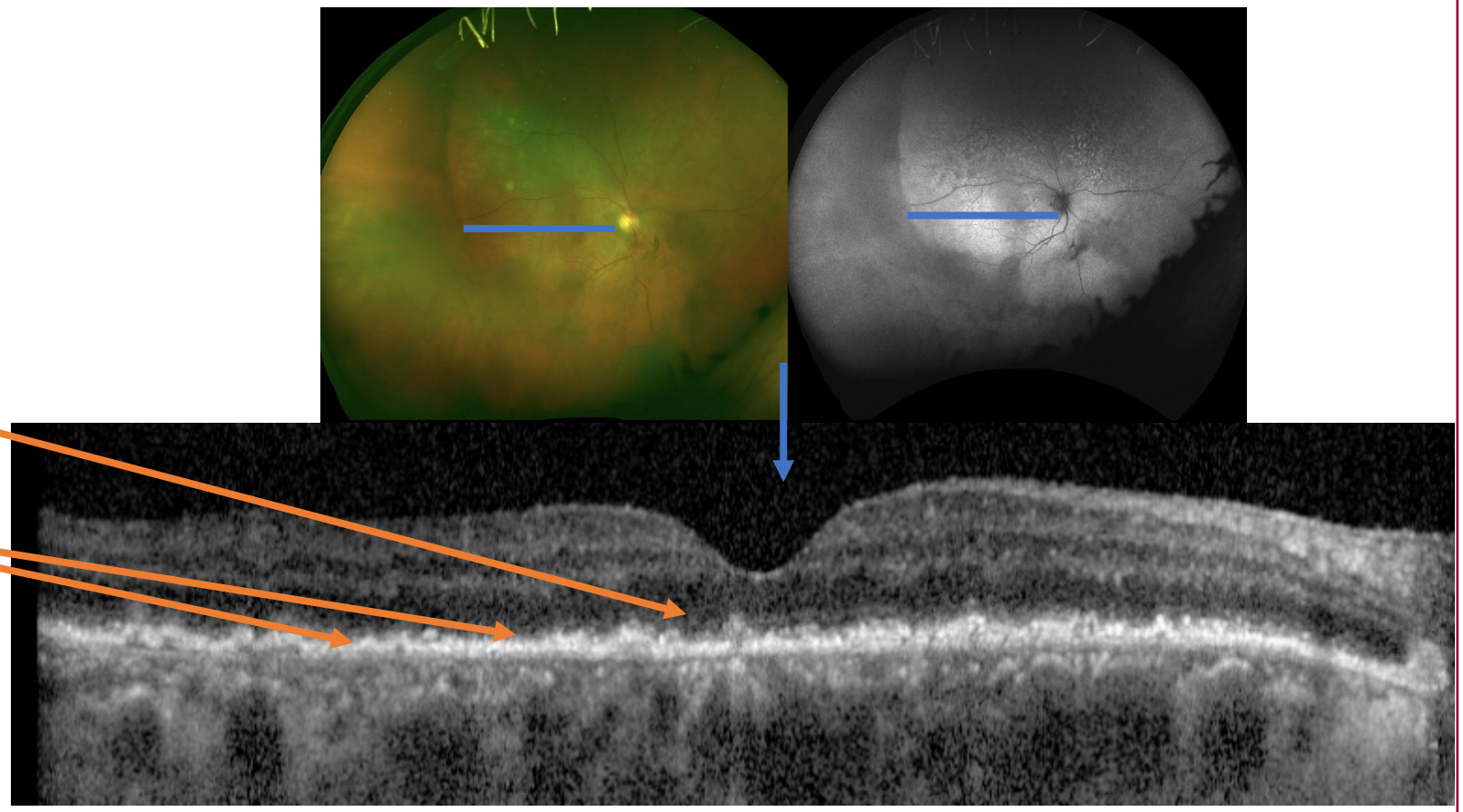


- 64 yo F with extensive biopsy proven CNS lymphoma
- Presenting VA: 20/100 OD
- Treated with intravitreal rituximab/methotrexate x6

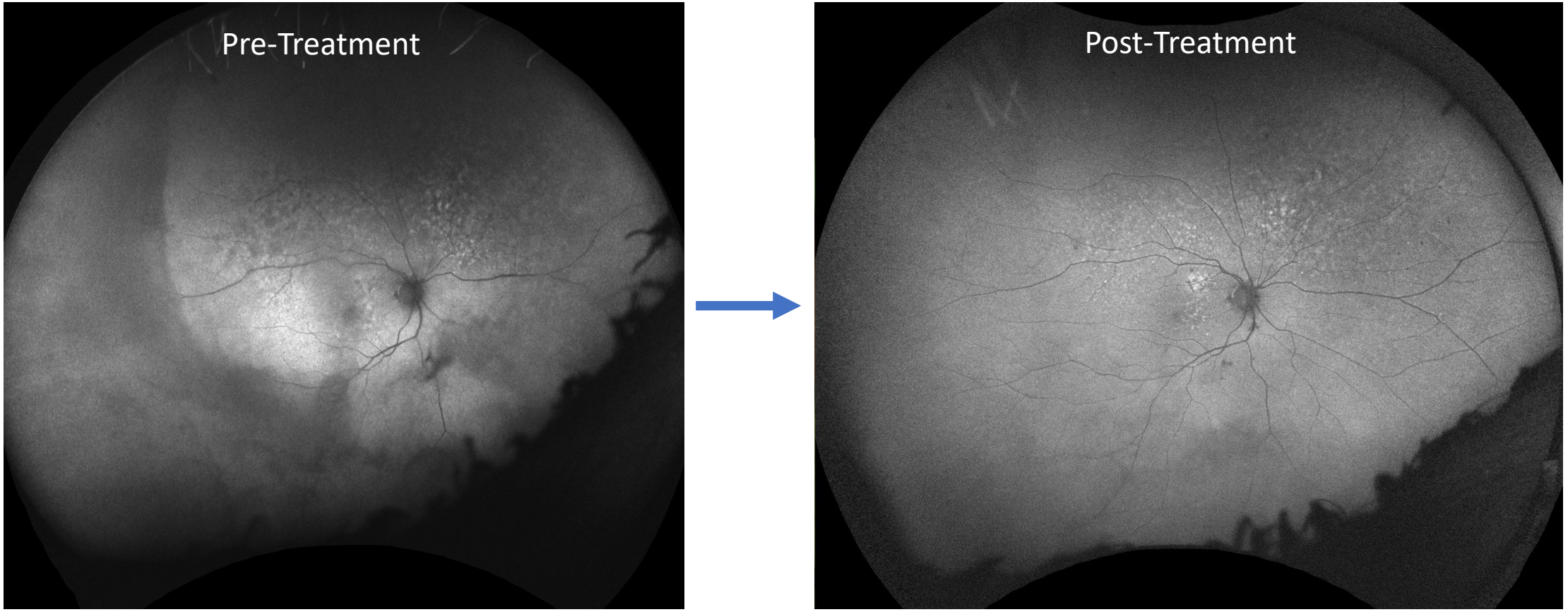
Example Case: Granular Pattern (n=9)



OCT Correlation



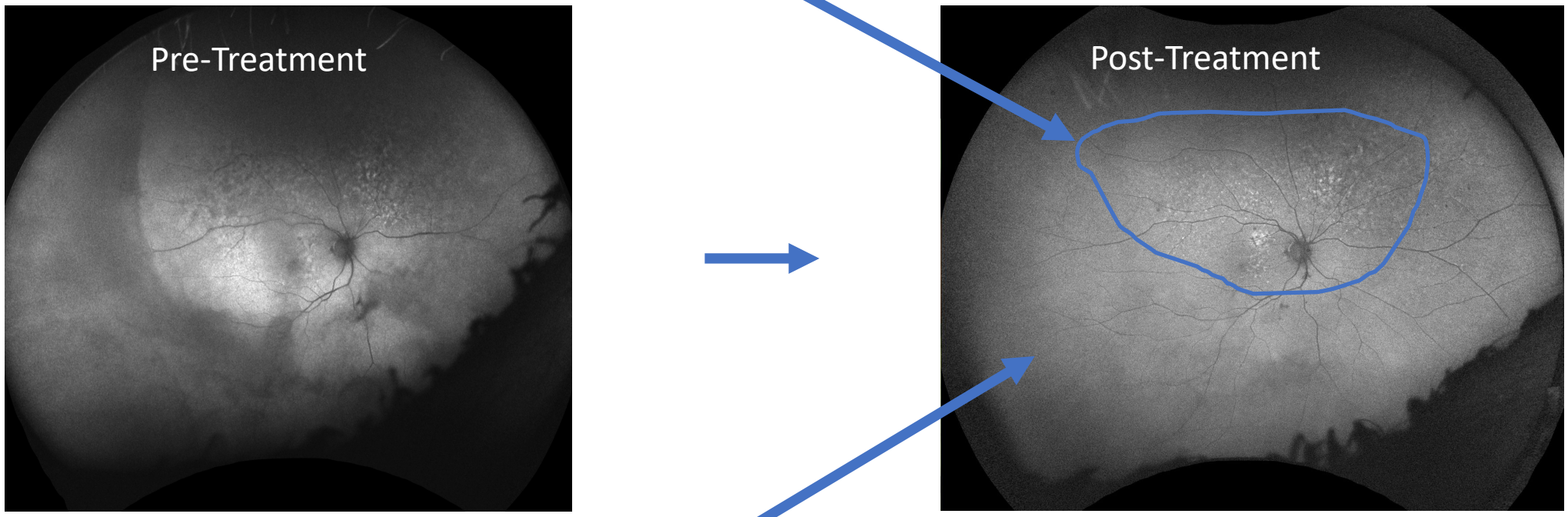
FAF Before and After Treatment



FAF Before and After Treatment

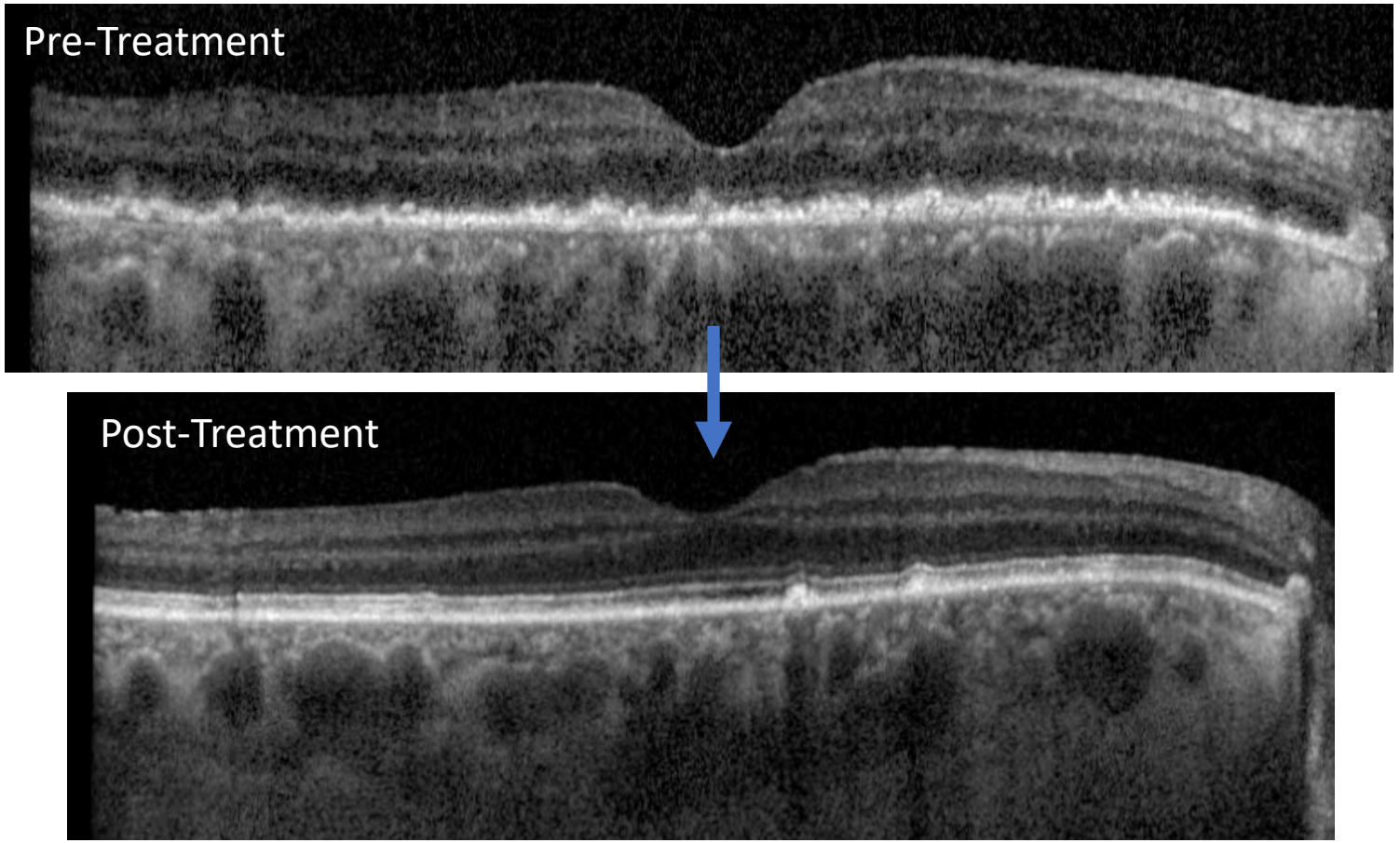
Some remaining granularity, with overall improvement

Final VA: 20/25

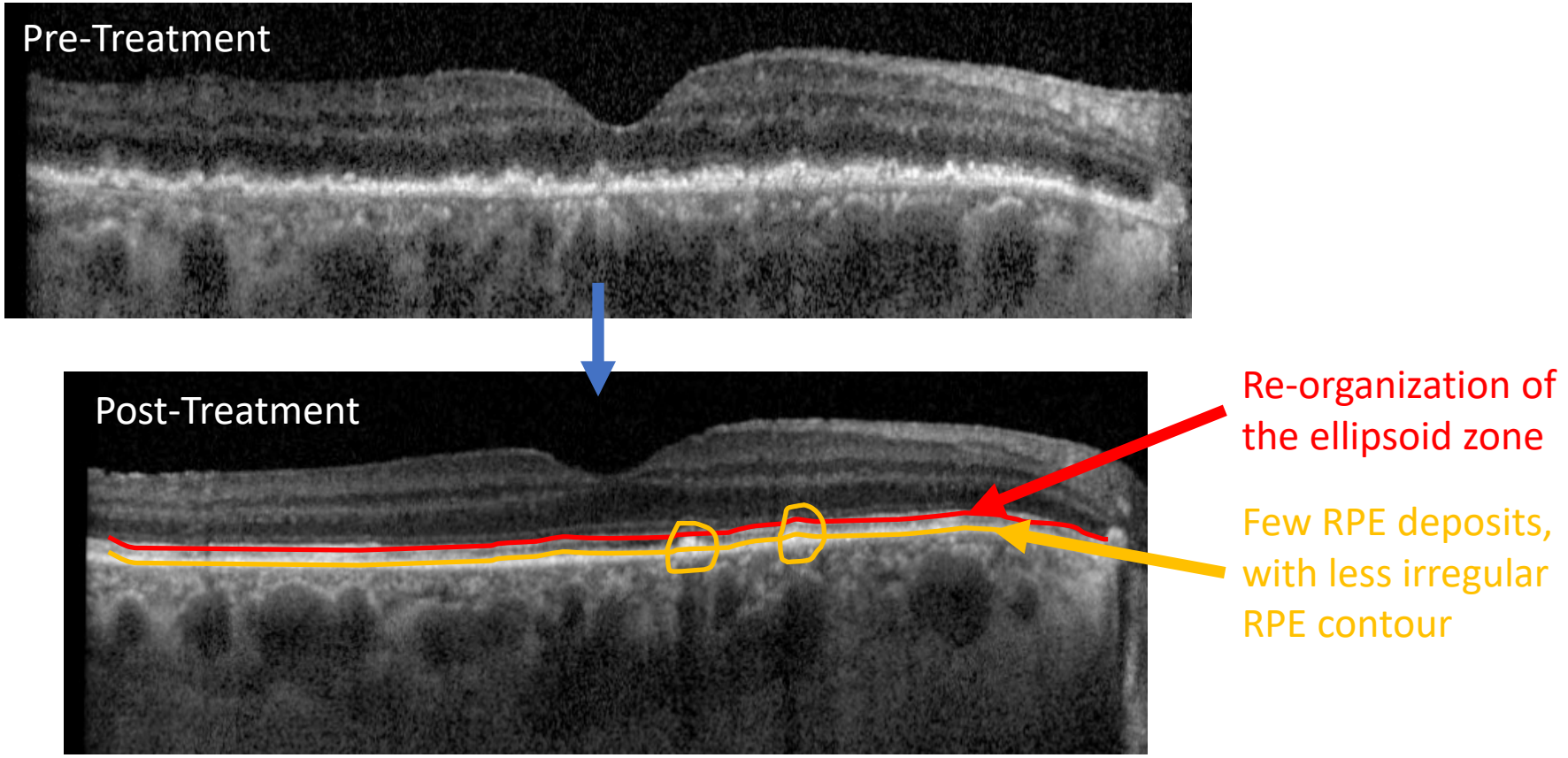


Resolved blockage with more uniform isofluorescent background

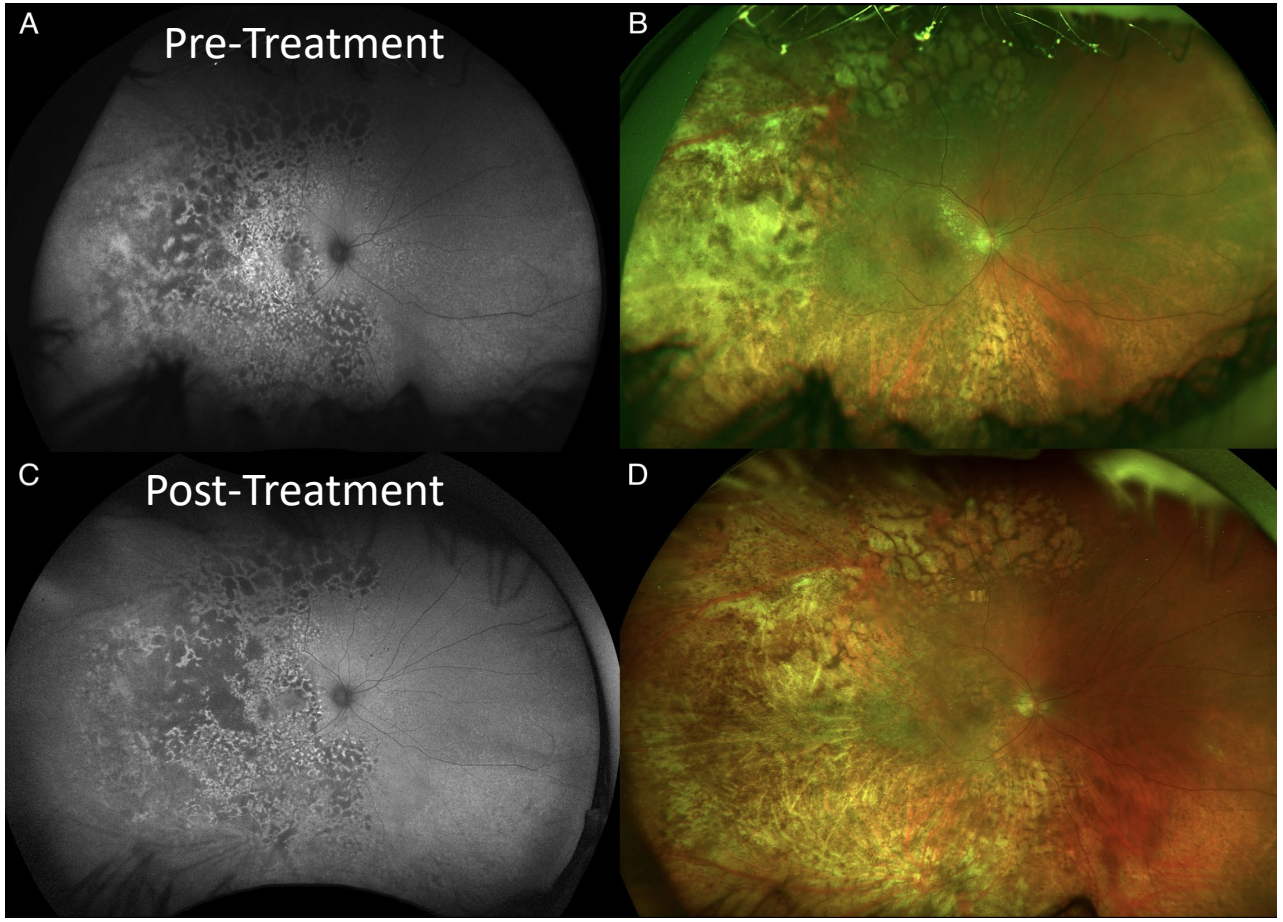
OCT Before and After Treatment



OCT Before and After Treatment



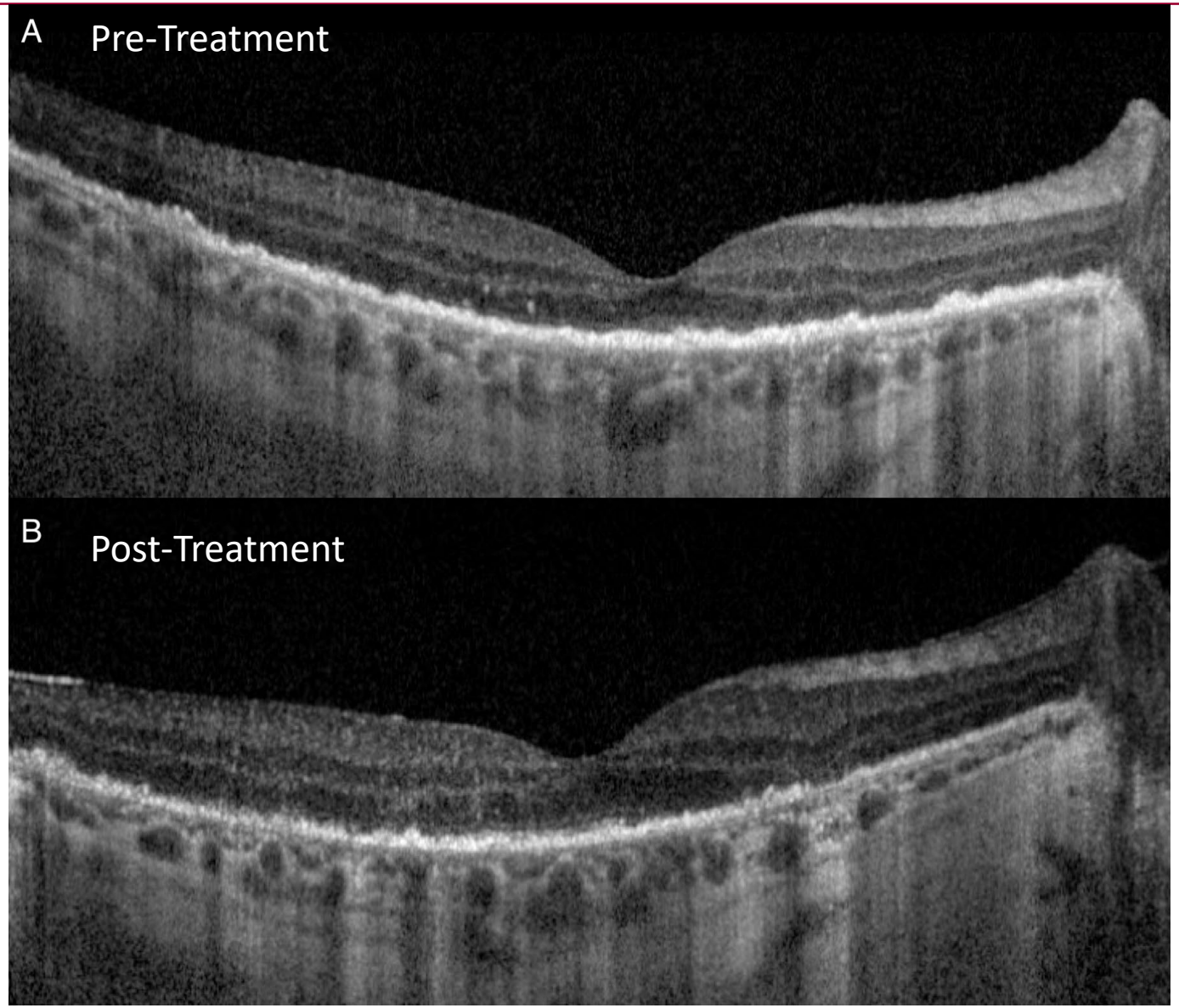
The Granular Pattern: Another Example



- A, B: Pre-Treatment
- C, D: Post-Treatment

- FAF shows the observed granular pattern of hyperautofluorescence with intervening areas of hypoautofluorescence, with decreased fluorescence and increasing atrophic areas after treatment.

- Corresponding OCT images before (A) and after (B) treatment are notable for RPE deposits and irregularities that appear to decrease in size and hyper-reflectivity after treatment.



Results

- After treatment, 8 of 9 (89%) of these eyes had a decrease in the granular pattern
  - Some lesions became atrophic and hypoautofluorescent, corresponding to RPE disruption or fibrosis on OCT.
  - One eye had an unchanged granular FAF pattern at follow up after treatment
  - One became uniformly isofluorescent without abnormality

Results

- Of the 4 eyes with an abnormal FAF pattern that was not granular:
  - Generalized hyperautofluorescence in the posterior pole
  - Hyperautofluorescent spots or larger lesions
  - Atrophic hypoautofluorescent spots
  - 3 of 4 (75%) eyes improved after treatment
- In three eyes, occult lesions not visible on fundoscopy or FAF appeared as hypoautoflourescent lesions after treatment.
- In the 10 of 23 eyes (43%) without baseline FAF findings, vitreous involvement was the primary site of disease activity.

Conclusions

- FAF is a useful modality both for diagnosis and monitoring response to treatment.
- When abnormalities are present, they may correlate with disease activity.
- Findings often exist outside of the posterior pole, suggesting a role for widefield imaging.
- In the future, understanding of these findings may lead to earlier diagnosis or recurrence detection.

Acknowledgements

- Mentors and Coauthors:
  - Dr. Jasmine Francis and Dr. David Abramson at Memorial Sloan Kettering Cancer Center

- Grant Support:
  - The Manhattan Eye Foundation

Thank you!

- To my mentors Dr. Francis and Dr. Abramson.
- To my program director Dr. Douglas Fredrick for nominating this research.
- To the audience and moderators for your attention.