Ultrawide-field Imaging
For
Retinal Conditions

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Thank you, Dr. Lazzaro!
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Adaptive Optics Imaging

30 degrees

3 degrees

2 μm resolution
Proliferative Diabetic Retinopathy
Retina 2012;32(4):785-791
Retinal Ischemia Correlated with DME in Treatment-naïve Patients with DR

- 76/122 eyes (62%) of patients with DM had areas of retinal ischemia
- Presence of retinal ischemia correlated with presence of DME (P<0.001)
- Patients with retinal ischemia had 3.75 times increase odds of having DME compared with those without retinal ischemia (CI 1.26 to 11.13, p<0.02)
- Degree of retinal ischemia did not correlated with presence of DME or retinal thickening on OCT

Ultrawide-field Imaging and Targeted Therapy: Does It Matter?
Case

- 83 yo man with dry AMD, OU
- CC: decreased vision OD; VA 20/80
Clinical Course

- BRVO with ME
- Began treatment with ranibizumab
- Despite 8 injections, recurrences whenever injection interval extended longer than 6-8 weeks
What Would You Do?

- Continue ranibizumab
- Switch anti-VEGF agents
- Grid laser
- Steroids
Ultrawide Field FA
Treatment

- UWFA-guided peripheral scatter laser
- Ranibizumab q1 month x 6 months
Clinical Course

- No recurrences for the following 8 months
Clinical Course

- Vision stable at 20/25, OCT stable
VEGF is Elevated in Active RVO/PDR

Hypothesis

- PRP to the areas of nonperfusion may decrease VEGF production
- Reduced VEGF production may result in fewer anti-VEGF injections needed to improve macular edema
“REVOLUTIONARY” Study: Retinal Vein Occlusion Treatment With Scatter Laser Guided By UWFA In Combination With Ranibizumab Study
Study Design

Macular Edema Secondary to BRVO

Peripheral Nonperfusion on Optos UWFA

1:1 Randomization

Ranibizumab 0.5 mg + Scatter Laser

Ranibizumab 0.5 mg

6-month treatment period, monthly injections

6-month PRN treatment, monthly PRN ranibizumab†
(monthly PRN treatment based on pre-specified criteria)

Month 6 Primary Endpoint; VA, OCT
REVOLUTIONARY: Results

- Similar visual acuity and OCT results at 6 and 12 months between 2 groups
  - Slightly favored treatment group

- Recurrence rate of ME at Month 6-12:
  - Revolutionary Group: 1/6 patients
  - Control Group: 6/6 patients
Adjunctive UWFA-guided peripheral scatter laser may be a reasonable treatment option in patients with ME due to BRVO and associated peripheral nonperfusion on WFA
- Decreased recurrence rate of ME due to BRVO
Spaide, R. Peripheral Areas Of Nonperfusion In Treated Central Retinal Vein Occlusion As Imaged By Wide-field Fluorescein Angiography. Retina 2011;31(5):829-837
Spaide, R. Peripheral Areas Of Nonperfusion In Treated Central Retinal Vein Occlusion As Imaged By Wide-field Fluorescein Angiography. Retina 2011;31(5):829-837
Peripheral PRP in CRVO on Injection Frequency and VA

- Laser areas of nonperfusion and 1 DD into perfused area
- Ranibizumab PRN
- Number of ranibizumab injections 6 months prior to PRP and the subsequent 6 months, starting 2 months after PRP

Spaide, RF. Prospective Study of Peripheral Panretinal Photocoagulation of Areas of Nonperfusion in Central Retinal Vein Occlusion. Retina 2013;33:56-62
Peripheral PRP in CRVO on Injection Frequency and VA

- 10 patients
- Average duration of tx prior to PRP: 39 months
- Neither the injection frequency nor the VA significantly changed as result of the laser PRP

Spaide, RF. Prospective Study of Peripheral Panretinal Photocoagulation of Areas of Noperfusion in Central Retinal Vein Occlusion. Retina 2013;33:56-62
Results of a Proof of Concept Study

- Prospective study randomized 22 CRVO patients into two arms and fu for 6 months
- RL group (ranibizumab + laser; n = 10) and the control R group (n = 12) treated with ranibizumab only
- All patients received 3 initial monthly ranibizumab injections followed by PRN regimen.
- Median of BCVA improved in the RL group from 65 ETDRS letters at baseline to 70. In the control group BCVA remained stable at 61 letters.
- “More pronounced improvements in BCVA were seen in the RL group (medians = 14 vs. 6.5 letters) although the observed group differences were not statistically significant due to small samples”
- “The selective laser photocoagulation of peripheral areas of nonperfusion seems to lead to additional visual improvement in patients with CRVO. A larger replication trial is necessary to confirm the results of this proof of concept study.”

Conclusion

- Peripheral nonperfused areas may contribute to the overall VEGF load.
- Targeted retinal photocoagulation (TRP) of peripheral areas of ischemia may alter the need for anti-VEGF injections or may influence VA.
  - TRP + anti-VEGF may prove efficacious in treating macular edema.
  - May avoid side effects of full PRP.
Further studies are needed
Summary

- Ultrawide-field imaging allows better evaluation of peripheral pathology
- Ultrawide-field FA is a useful tool for detecting peripheral retinal ischemia
  - Eyes with vascular disease have large areas of peripheral nonperfusion even if the posterior pole appears perfused
- May have direct implications in the diagnosis, follow-up and treatment
Thank You!
- Silva Paolo peripheral lesion increase
- German study on targeted therapy
Role of targeted retinal photocoagulation currently remains unclear

- Limited data
- Small case series
- Short follow up
- Refractory cases
- Significant benefit for VA, OCT, injection frequency not clearly shown yet
Detection and Monitoring of Sickle Cell Retinopathy

- In 3 eyes of 12 eyes, clinicians missed the peripheral vascular changes apparent on WFA.
- In 2/3 eyes, the detection of proliferative changes on WFA led to treatment with sector PRP.
- Improved imaging will be able to detect eyes at higher risk of developing proliferative form of SCR; improved surveillance and treatment.
