



Ultra-widefield Angiography-directed Peripheral Laser + Anti-VEGF in Diabetic Macular Edema Associated with Peripheral Nonperfusion (RaScaL Trial)



Ivan J. Suñer, MD

Duke Eye Center, Duke University, Durham, NC 27710

Study Questions:

1. Is ultra-widefield angiography useful in diagnosis of patients with diabetic macular edema associated with peripheral nonperfusion?
2. Is Ranibizumab + angiography-directed peripheral scatter laser (RaScaL) therapy effective in vision improvement and durability of therapy?

Introduction:

Diabetic macular edema is a leading cause of irreversible vision loss and legal blindness in developed countries.

Multiple studies and reports have shown benefits of various treatment modalities including macular laser, periocular and intravitreal triamcinolone, and intravitreal anti-VEGF.

Several observations suggest that diabetic macular edema may arise from different pathobiologies and, therefore, not all patients will respond to all treatments in a predictable way:

1. Some patients have excellent response to steroid treatment and not anti-VEGF treatment
2. Some patients have excellent response to anti-VEGF treatment and not steroid treatment
3. Panretinal photocoagulation has a beneficial effect on macular edema in select patients, and may exacerbate macular edema in others
4. In those that respond to intravitreal or periocular injections, there is a high recurrence rate necessitating injections every 1 – 3 months.

In this pilot study, we select patients with diabetic macular edema associated predominantly with peripheral capillary dropout/nonperfusion on ultra-widefield angiography (Optos P200MA). We hypothesize that this entity may have a significant component of VEGF production, and, therefore may be more responsive to anti-VEGF therapy. Furthermore, we postulate that scatter laser to the areas of nonperfusion may shut down VEGF production by ischemic retina, and thereby reduce the recurrence rate and provide an effective and durable therapy.

Methods:

Prospective, randomized, controlled, single-center pilot trial (60 patients total)

Entry Criteria:

Diabetic macular edema associated with peripheral nonperfusion on ultra-widefield angiography (Optos P200MA) without significant vitreomacular traction on OCT and no prior treatment.

Experimental Group:

Ranibizumab + ultra-widefield angiography-directed Scatter Laser (RaScaL) straddling border of capillary dropout and normal perfusion

Control Group:

macular laser + triamcinolone in patients with diabetic macular edema associated with peripheral nonperfusion

Primary Outcome Measures:

1. Improvement in best corrected visual acuity
2. Improvement in OCT Central Thickness
3. Recurrence of DME requiring additional injections/laser treatments

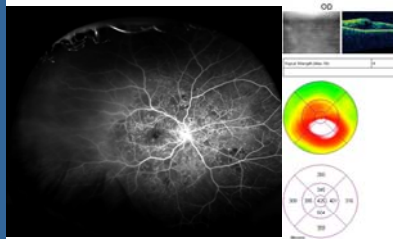
Main Exclusion Criteria:

1. Previous laser treatment (macular laser or panretinal photocoagulation)
2. Glaucoma requiring medical therapy (unless bilateral patient and unilateral glaucoma)
3. Visually-significant cataracts

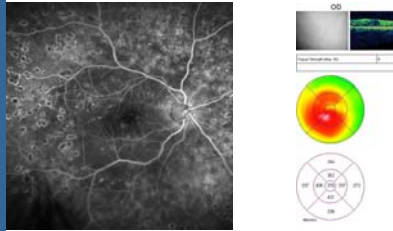
Sample Bilateral Patient OD:

Treatment: RaScaL

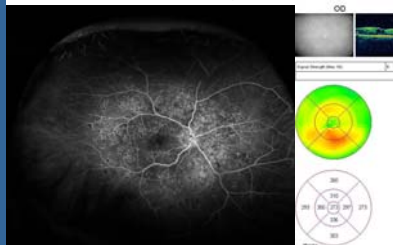
Baseline: Vision 20/50, CFT: 425 microns



3 Months: Vision 20/40, CFT: 376 microns



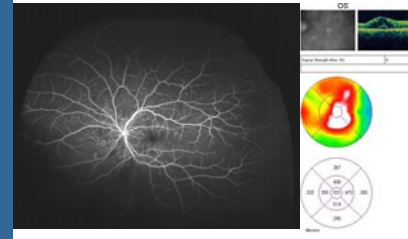
6 Months: Vision 20/30, CFT: 273 microns



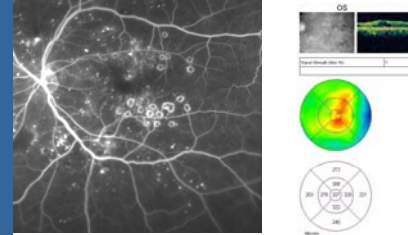
Sample Bilateral Patient OS:

Treatment: Focal + Kenalog

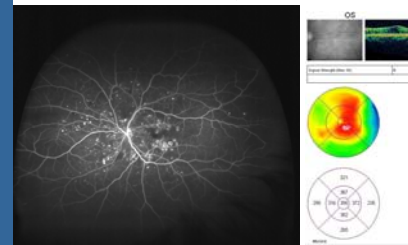
Baseline: Vision 20/60, CFT: 531 microns



3 Months: Vision 20/40, CFT: 327 microns



6 Months: Vision 20/50, CFT: 395 microns



Results:

Preliminary Results (10 eyes):

1. Higher recurrence of DME needing retreatment in macular laser + steroid (4/5) vs RaScaL (1/5). RaScaL patient treated with supplemental peripheral laser + Ranibizumab with resolution.
2. Vision improvement in both groups, with recurrence resulting in vision decrease.
3. Improvement in central foveal thickness in all groups (quicker resolution in macular laser + steroid), similar at 3 months, better in RaScaL at 6 months.

Conclusions:

1. Ultra-widefield angiography with the Optos P200MA is effective in identifying patients with peripheral nonperfusion and delimiting the area of nonperfusion.

2. Preliminary results indicate that RaScaL (Ranibizumab + Scatter Laser) may be a reasonable approach to provide visual acuity improvement and durable therapy. Completion of pilot and larger study needed to confirm.

Acknowledgements:

This research was supported through an Investigator Supported Trial Grant by Genentech