## 10:48 AM

# Outcomes of Pars Plana Vitrectomy for Tractional Retinal Detachment Secondary to Proliferative Diabetic Retinopathy


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**OBJECTIVE** Eyes with poor VA associated with VH are most likely to sustain visual improvement from surgery in TRD from PDR.

**PURPOSE** To determine outcomes of pars plana vitrectomy (PPV) for eyes with traction retinal detachment (TRD) due to proliferative diabetic retinopathy (PDR).

**METHODS** We conducted a retrospective chart review on patients who underwent PPV for TRD due to PDR at the University of Iowa Hospital and Clinics from 1/1/2001 to 1/1/2011. IRB approval was obtained. Exclusion criteria included prior PPV. Detailed pre-, intra-, and post-operative data were compiled. Statistical analysis was performed.

**RESULTS** 240 eyes representing 202 patients were analyzed. There were 106 (44.4%) right eyes and 133 (55.6%) left eyes. 38 patients (24 males, 14 females) met the inclusion criteria for both eyes (18.8%). The mean age at the time of surgery was 48 years old (median=48, range 21 to 88). 214 eyes were phakic and 25 were pseudophakic at the time of surgery. Median VA at pre-op, 3, 6, 12, and 60 months post-op was 20/320 (n=240), 20/125 (n=201), 20/100 (n=170), 20/125 (n=134), and 20/80 (n=57), respectively. In eyes with pre-operative VA of 20/80 or worse, there was a statistically significant improvement in VA at all time points ($p<0.0001$) for those with pre-operative vitreous hemorrhage. No statistically significant improvement in VA was found for those with pre-operative VA of 20/70 or better, or those without vitreous hemorrhage. 15 (6.3%) eyes required re-operation due to retinal detachment. 3 (1.3%) eyes required enucleation.

**CONCLUSION** Eyes with poor VA associated with VH are most likely to sustain visual improvement from surgery in TRD from PDR. For patients with better VA, the benefits of PPV for TRD were unclear, perhaps because of longstanding or severe macular disease. These patients are at risk for bilateral visual loss as contralateral TRDs were common.

**TAKE HOME MESSAGE** Visual gain after vitrectomy for traction retinal detachment in proliferative diabetic retinopathy is limited to a select group of patients.

## 10:56 AM

# Diabetic Retinopathy Lesions and Photoreceptor Mosaic Changes as Assessed with Ultrahigh Resolution Adaptive Optics Scanning Laser Ophthalmoscopy


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**OBJECTIVE** To characterize hallmark lesions of diabetic retinopathy and changes in the photoreceptor mosaic in diabetes utilizing an ultrahigh resolution adaptive optics scanning laser ophthalmoscope system.

**PURPOSE** To evaluate hallmark lesions of diabetic retinopathy (DR) and differences in photoreceptor (PR) density and arrangement with ultrahigh resolution, non-invasive adaptive optics scanning laser ophthalmoscopy (AOSLO).

**METHODS** A 10x10 block grid of 1°x1.2° frames (50 frames/block, resolution limit=2μ) was acquired centered on the fovea. Foveal, superotemporal (ST) and inferotemporal (IT) blocks (ST and IT images at foveal eccentricity=1.7mm) were selected, aligned and averaged using customized software. PR density (PRD) and Voronoi tessellation particle areas (VTPA, a measure of area occupied by each PR) were evaluated by 2 masked graders using ImageJ. PRD discrepancies >20% were adjudicated by consensus. WinDRP was used to perform nearest neighbor calculations. ETDRS fundus photographs and OCT were assessed by a masked grader in order to determine DR and DME severity.

**RESULTS** Twenty-one subjects (21 eyes) had mean+SD age of 47+14 yrs, 57% (N=12) were male and 71% (15) had diabetes (DM) of 22+17 yrs duration. Of diabetic eyes, 19%

(4) had no DR, 14% (3) mild nonproliferative DR (NPDR), 29% (6) moderate NPDR, 10% (20) severe NPDR or proliferative DR, and 33% (5) had diabetic macular edema (DME). Blood flow within some microaneurysms was clearly distinguishable on AOSLO and hard exudates were visible as highly reflective, granular lesions with darkened edges. Eyes with DME had lower ST PRD (p=0.004), higher VTPA (p=0.004), and decreased nearest neighbor regularity index (p=0.0001) despite the fact that 3/5 eyes with DME did not have ST DME lesions on photos or OCT. There was no association between DME and foveal PR parameters. Worse DR severity was associated with increased ST VTPA (p=0.03) and decreased ST nearest neighbor regularity index (p=0.03), but these trends were not significant after adjusting for DME severity.

**CONCLUSION** AOSLO allows the detailed, in vivo characterization of hallmark DR lesions and the photoreceptor mosaic of the diabetic retina. ST photoreceptor differences in DME may be related to early blood flow changes and propensity for neovascularization in that quadrant. If confirmed in future studies, AOSLO parameters may be useful as predictive biomarkers of DME or DR.

**TAKE HOME MESSAGE** Adaptive optics scanning laser ophthalmoscopy allows the detailed, in vivo characterization of hallmark lesions of diabetic retinopathy and the photoreceptor mosaic of the diabetic retina.