Retina Roundup
April 2019

Classification of Regions of Nonperfusion on Ultra-widefield Fluorescein Angiography in patients with Diabetic Macular Edema.

Fang M, Fan W, Shi Y, Ip MS, Wykoff CC, Wang K, Falavarjani KG, Brown DM, van Hemert J, Sadda SR.

Am J Ophthalmol. 2019 Apr 5. pii: S0002-9394(19)30141-2. doi: 10.1016/j.ajo.2019.03.030.
[Epub ahead of print]

ABSTRACT

PURPOSE:

To classify retinal nonperfusion regions (NPR) in patients with diabetic macular edema (DME) and assess the relationship with severity of DME.

DESIGN:

Prospective, observational case series.

METHODS:

Forty eyes of 29 patients with treatment-naïve center-involved macular edema secondary to diabetes mellitus were included (The DAVE study, NCT01552408) in this analysis. Ultra-widefield fluorescein angiography (UWF FA) images were transmitted to the Doheny Image Reading Center, where they were corrected using stereographic projection to adjust for peripheral distortion. Two independent, certified graders manually evaluated the NPR and classified the nonperfusion as being associated with leakage, or without leakage. The size of these two subtypes of NPR were computed in mm^2 and assessed across the entire retina and within three concentric retinal zones. The relationship between subtype of NPR and the severity of DME was assessed.

RESULTS:

In forty eyes with treatment-naïve DME, visual acuity was significantly correlated with central macular thickness (CMT) and macular volume (MV). The NPR with leakage was positively correlated with CMT (R=0.408, P=0.009) and MV (R=0.399, P=0.011), whereas the NPR without leakage was negatively correlated with CMT (R=-0.468, P=0.002) and MV (R=-0.473, P=0.002). The NPR with leakage in the posterior region was significantly greater compared to the mid-periphery and the far-periphery (P<0.001), whereas the NPR without leakage was significantly greater in the mid-periphery compared to the far-periphery or the posterior region (P=0.001).

CONCLUSION:

In patients with DME, the severity of DME appears to be positively correlated with NPR with leakage, but negatively correlated with NPR without leakage. These findings may have implications for the pathophysiology of DME and the design of protocols for targeted laser in these eyes.

KEYWORDS:

Diabetic Macular Edema; Leakage; Nonperfusion Region; Ultra-widefield

PMID: 30959003

Focal and diffuse chronic central serous chorioretinopathy treated with half-dose photodynamic therapy or subthreshold micropulse laser.

van Rijssen TJ, van Dijk EHC, Scholz P, Breukink MB, Blanco-Garavito R, Souied EH, Keunen JEE, MacLaren RE, Querques G, Fauser S, Downes SM, Hoyng CB, Boon CJF.

Am J Ophthalmol. 2019 Apr 2. pii: S0002-9394(19)30135-7. doi: 10.1016/j.ajo.2019.03.025. [Epub ahead of print]

ABSTRACT

PURPOSE:

To compare the outcome between high-density subthreshold micropulse laser (HSML) treatment and half-dose photodynamic therapy (PDT) in chronic central serous chorioretinopathy (cCSC) patients, subdivided based on either focal or diffuse leakage on fluorescein angiography (FA). Design; Retrospective analysis of multicenter randomized controlled trial data METHODS: Patients were treated with either half-dose PDT or HSML (both ICGA-guided) and categorized in 2 groups, based on focal or diffuse leakage on FA. Clinical outcomes were evaluated at baseline and during follow-up.

RESULTS:

In the focal leakage group (63 patients), both at first evaluation and final visit, more PDT-treated than HSML-treated patients demonstrated a resolution of subretinal fluid (evaluation visit 1: 57% in the PDT group and 17% in the HSML group, p=0.007; final visit:75% and 38%, p=0.012). In the diffuse leakage group (93 patients), both at first evaluation and final visit, more PDT-treated than HSML-treated patients showed a resolution of subretinal fluid (evaluation visit 1:48% in the PDT group and 16% in the HSML group, p=0.002; final visit:67% and 21%, p=0.002). PDT-treated patients in the focal and diffuse leakage group had a higher retinal sensitivity increase, comparing baseline and final visit (+3.1±3.1dB versus +1.2±4.0dB, p=0.048, and +2.7±3.3dB versus +1.0±3.8dB, p=0.036, respectively). Only in the diffuse leakage group, the increase in ETDRS letters was higher in the PDT-treated group when comparing baseline and first evaluation visit (+4.4±6.1 versus +0.9±10.0, p=0.049).

CONCLUSIONS:

Half-dose PDT is superior to HSML treatment in cCSC patients, regardless of the presence of focal or diffuse leakage on FA.

PMID:30951686

Anatomic, Visual, and Financial Outcomes for Traditional and Nontraditional Primary Pneumatic Retinopexy for Retinal Detachment.

Jung JJ, Cheng J, Pan JY, Brinton DA, Hoang QV.

Am J Ophthalmol. 2019 Apr;200:187-200. doi: 10.1016/j.ajo.2019.01.008. Epub 2019 Jan 24.

ABSTRACT

PURPOSE:

To determine factors predictive of anatomic, visual, and financial outcomes after traditional and nontraditional primary pneumatic retinopexy (PR) for rhegmatogenous retinal detachment (RD).

DESIGN:

Retrospective interventional case series and cost comparison.

METHODS:

Participants: Total of 178 eyes (156 patients) with PR-repaired primary RD by a single surgeon at a clinical practice from January 2001 to December 2013 and followed for ≥1 year. The cohort had 2 subgroups: traditional (TPR) and nontraditional (NTPR) PR.

MAIN OUTCOME MEASURES:

Characteristics associated with best-corrected visual acuity (BCVA) and anatomic outcomes. Cost analysis and potential cost savings comparing PR to scleral buckle and vitrectomy.

RESULTS:

One hundred thirty-one of 178 eyes (73.5%) were successfully treated at 1 year (postoperative year 1): 72.8% (75/103) in TPR and 74.6% (56/75) in NTPR. Macula-off detachment (-0.44 logMAR, P < .001) and clock hours of RD (-0.84 logMAR, P < .001) correlated with improved BCVA; pseudophakia (0.26 logMAR, P = .002) and inferior retinal tears (0.62 logMAR, P = .009) correlated with worsening BCVA. Pseudophakia (-0.15, P = .03), inferior quadrant RD (-0.27, P < .001), and proliferative vitreoretinopathy (-0.68, P < .001) correlated with anatomic failure. Total average cost for TPR and NTPR was $1248.37 ± $882.11 and $1471.91 ± $942.84, respectively (P = .10). PR had a potential cost savings of 62% and 60.8% when compared to scleral buckle and vitrectomy, respectively.

CONCLUSIONS:

PR results in successful anatomic and visual outcomes in both TPR and NTPR repair of primary RD. Preoperative pseudophakia is associated with worse visual outcomes and less anatomic success. The cost of primary PR and subsequent procedures to achieve final anatomic success was not significantly different between TPR and NTPR, and supports the possible cost-effectiveness of expanded indications for PR.

PMID:30684455

PMCID:PMC6445687[Available on 2020-04-01]

Vitrectomy for Diabetic Macular Edema: Optical Coherence Tomography Criteria and Pathology of the Vitreomacular Interface.

Hagenau F, Vogt D, Ziada J, Guenther SR, Haritoglou C, Wolf A, Priglinger SG, Schumann RG.

Am J Ophthalmol. 2019 Apr;200:34-46. doi: 10.1016/j.ajo.2018.12.004. Epub 2018 Dec 14.

ABSTRACT

PURPOSE:

To correlate spectral-domain optical coherence tomography (SDOCT) criteria and clinical data with pathology of the vitreomacular interface (VMI) in eyes with diabetic macular edema (DME).

DESIGN:

Retrospective cross-sectional study and laboratory investigation.

METHODS:

We included specimens of 27 eyes of 26 patients with center-involved DME that underwent vitrectomy with peeling of the internal limiting membrane (ILM). Selection of specimens was consecutive and in retrospect using our register of the Vitreoretinal Pathology Unit. Clinical data and SDOCT examinations were correlated to immunocytochemistry and transmission electron microscopy. Classification of DME comprised sponge-like diffuse retinal thickening, cystoid macular edema, and serous retinal detachment. VMI was evaluated for presence of epiretinal membrane (ERM) and thickened vitreous cortex (tVC).

RESULTS:

ERMs and tVC were found in all DME types. Diffuse DME showed tVC more often than cystoid DME. Hyalocytes, contractile myofibroblasts, glial cells, matrix metalloproteinases-2 and -9, and collagen type I, II, and III were positive tested irrespective of DME type. There were no significant cell fragments at the retinal side of the ILM. Visual acuity improved in the majority of cases and macular thickness decreased significantly during mean follow-up of 17 ± 10 months.

CONCLUSIONS:

All eyes presented pathologic VMI changes irrespective of the OCT classification of DME type or presence of ERM. Composition of fibrocellular membranes at the VMI indicated remodeling of vitreous cortex and transdifferentiation of hyalocytes into myofibroblasts. Our findings might argue for an early surgical intervention in eyes with DME irrespective of the presence of traction formation imaged by SDOCT.

PMID:30557531

Membrane patterns in eyes with choroidal neovascularization on optical coherence tomography angiography.

Karacorlu M, Sayman Muslubas I, Arf S, Hocaoglu M, Ersoz MG.

Eye (Lond). 2019 Apr 1. doi: 10.1038/s41433-019-0415-1. [Epub ahead of print]

ABSTRACT

BACKGROUND:

To evaluate morphologic patterns of choroidal neovascular membranes using optical coherence tomography angiography (OCTA) in patients with treatment-naive, continuously treated, and previously treated exudative age-related macular degeneration (AMD).

SUBJECTS:

We assessed retrospectively 184 eyes of 153 patients diagnosed with type 1, type 2, and mixed-type neovascularization associated with AMD. The type of neovascularization and clinical activity were assessed by clinical examination and spectral domain optical coherence tomography (SD-OCT). Morphological patterns of neovascular membranes were categorized using en face images on the AngioVue (Optovue) OCTA system.

RESULTS:

The mean age of patients was 77.9 ± 8.6 years (range, 52-96 years). The most frequently identified type of membrane morphology was well-defined in the treatment-naive group (69% of the eyes) and in eyes receiving ongoing anti-VEGF treatments (77% of the eyes). Long-filamentous morphology was the most frequent type in the previously treated group (53%), in which only 33% had a well-defined membrane. All clinically active cases had a well-defined pattern, such as a medusa or sea-fan shaped pattern, or an ill-defined pattern, and none had a long-filamentous neovascular network. Almost half of the clinically inactive cases (47%) had well- or ill-defined, identifiable membrane morphology on OCTA. A long-filamentous membrane pattern, which was consistent with chronicity of lesion, was seen only in eyes with inactive neovascularization.

CONCLUSIONS:

The membrane morphology on OCTA was not associated with clinical activity, except that the presence of long dilated filamentous linear vessels was associated with chronicity and lesion inactivity.

PMID:30932032

INTRAVITREAL ZIV-AFLIBERCEPT FOR NEOVASCULAR AGE-RELATED MACULAR DEGENERATION: 52-Week Results.

de Oliveira Dias JR, Costa de Andrade G, Kniggendorf VF, Novais EA, Takahashi VKL, Maia A, Meyer C, Watanabe SES, Farah ME, Rodrigues EB. IntravitrealZiv-aflibercept for neovascular age-related macular degeneration: 52-week Results.

Retina. 2019 Apr;39(4):648-655 doi: 10.1097/IAE.0000000000002001

ABSTRACT

PURPOSE:

To evaluate the 52-week safety and efficacy of intravitreal ziv-aflibercept in patients with neovascular age-related macular degeneration.

METHODS:

All patients received three monthly intravitreal injections of 0.05 mL of ziv-aflibercept (1.25 mg) followed by a pro re nata regimen. The best-corrected visual acuity and spectral domain optical coherence tomography were obtained at baseline and monthly. Full-field and multifocal electroretinograms were obtained at baseline and 4, 13, 26, and 52 weeks. For some full-field electroretinography parameters, we calculated the differences between baseline and 52 weeks and then compared those differences between treated and untreated fellow eyes.

RESULTS:

Fifteen patients were included and 14 completed the 52-week follow-up. The mean best-corrected visual acuity improved from 0.95 ± 0.41 (20/200) at baseline to 0.75 ± 0.51 (20/125) logarithm of the minimum angle of resolution at 52 weeks ($P = 0.0066$). The baseline central retinal thickness decreased from 478.21 ± 153.48 μ m to 304.43 ± 98.59 μ m ($P = 0.0004$) at 52 weeks. Full-field electroretinography parameters used to assess retinal toxicity after intravitreal injections (rod response and oscillatory potentials) remained unchanged during follow-up. The average multifocal electroretinography macular response in 5° showed increased N_1 -P_1 amplitude and decreased P_1 implicit time ($P < 0.05$). One patient presented with intraocular inflammation after the seventh intravitreal procedure.

CONON:

The results suggested that intravitreal ziv-aflibercept might be safe and effective for treating neovascular age-related macular degeneration. More patients and a longer follow-up are needed to confirm the long-term outcomes of intravitreal ziv-aflibercept.

PMID:29232334

The Port Delivery System with Ranibizumab for Neovascular Age-Related Macular Degeneration: Results from the Randomized Phase 2 Ladder Clinical Trial.

Campochiaro PA, Marcus DM, Awh CC, Regillo C, Adamis AP, Bantseev V, Chiang Y,Ehrlich JS, Erickson S, Hanley WD, Horvath J, Maass KF, Singh N, Tang F,Barteselli G. The Port Delivery System with Ranibizumab for Neovascular Age-Related Macular Degeneration: Results from the Randomized Phase 2 Ladder Clinical Trial.

Ophthalmology. 2019 Apr 1.doi: 10.1016/j.ophtha.2019.03.036. [Epub ahead of print]

ABSTRACT

PURPOSE:

To evaluate the safety and efficacy of the Port Delivery System with ranibizumab (PDS) for neovascular age-related macular degeneration (nAMD) treatment.

DESIGN:

Phase 2, multicenter, randomized, active treatment-controlled clinical trial.

PARTICIPANTS:

Patients diagnosed with nAMD within 9 months who had received ≥ 2 prior anti-vascular endothelial growth factor intravitreal injections and were responsive to treatment.

METHODS:

Patients were randomized 3:3:3:2 to receive the PDS filled with ranibizumab 10 mg/mL, 40 mg/mL, and 100 mg/mL formulations or monthly intravitreal ranibizumab 0.5 mg injections.

MAIN OUTCOME MEASURES:

Time to first implant refill assessed when the last enrolled patient completed the month 9 visit (primary efficacy endpoint); improvement in best-corrected visual acuity (BCVA) and central foveal thickness (CFT); and safety.

RESULTS:

The primary analysis population was 220 patients, with 58, 62, 59, and 41 patients in the PDS 10 mg/mL, 40 mg/mL, and 100 mg/mL arms and the monthly intravitreal ranibizumab 0.5 mg arm, respectively. Median time to first implant refill was 8.7, 13.0, and 15.0 months in the PDS 10 mg/mL, 40 mg/mL, and 100 mg/mL arms, respectively. At month 9, the adjusted mean BCVA change from baseline was –3.2, –0.5, +5.0,

and +3.9 Early Treatment Diabetic Retinopathy Study letters in the PDS 10 mg/mL, 40 mg/mL, and 100 mg/mL arms and the monthly intravitreal ranibizumab 0.5 mg arms, respectively. At month 9, the adjusted mean CFT change from baseline was similar in the PDS 100 mg/mL and the monthly intravitreal ranibizumab 0.5 mg arms. The optimized PDS implant insertion and refill procedures were generally well tolerated. After surgical procedure optimization, postoperative vitreous hemorrhage rate was 4.5% (7/157; 1 event classified as serious). There was no evidence of implant clogging.

CONCLUSIONS:

In the phase 2 Ladder trial, the PDS was generally well tolerated and demonstrated a dose response across multiple endpoints in patients with nAMD. The PDS 100 mg/mL arm had visual and anatomic outcomes comparable with monthly intravitreal ranibizumab 0.5 mg injections, but with a reduced total number of ranibizumab treatments. The PDS has the potential to reduce treatment burden in nAMD while maintaining vision.

PMID:30946888

April Segment Compiled by : Dr. Chitaranjan Mishra , Aravind Eye Hospital, Madurai