Retina Roundup
March 2020

Widefield optical coherence tomography angiography for early detection and objective evaluation of proliferative diabetic retinopathy.

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ABSTRACT

PURPOSE:

To evaluate the utility of widefield optical coherence tomography angiography (WF-OCTA) compared with clinical examination in grading diabetic retinopathy in patients diagnosed clinically with proliferative diabetic retinopathy (PDR) or severe non-proliferative diabetic retinopathy (NPDR).

DESIGN:

This retrospective observational case series included patients diagnosed clinically with PDR or severe NPDR. Patients underwent standard clinical examination and WF-OCTA imaging (PLEX Elite 9000, Carl Zeiss Meditec AG) using 12×12 montage scans between August 2018 and January 2019. Two trained graders identified neovascularisation at the disc (NVD) and neovascularisation elsewhere (NVE) on WF-OCTA which were compared with the clinical examination, and to ultra-widefield fluorescein angiography (UWFA) when available.

RESULTS:

Seventy-nine eyes of 46 patients were evaluated. Of those, 57 eyes were diagnosed clinically with PDR, and 22 with severe NPDR. NVD was detected on OCTA-B scan as preretinal hyperreflective material (PRHM) in 39 eyes (100%) with evident flow signals in 79.5% compared with 51.3% detected clinically. We further classified NVD on OCTA into four subtypes and found that subtypes 1 and 2 could not be seen on clinical examination alone. WF-OCTA detected NVE in 81% of the cases compared with 55.7% detected clinically. Using WF-OCTA resulted in a higher percentage of PDR grading (88.6%) than on clinical examination (72.2%). When available, UWFA confirmed the WF-OCTA diagnosis in the majority of cases.

CONCLUSION:

This study demonstrates that WF-OCTA has a higher detection rate of PDR than clinical examination. This suggests that this modality could be used non-invasively for the purpose of early detection and characterisation of neovascularisation.

Risk factors for subretinal fibrosis after anti-VEGF treatment of myopic choroidal neovascularisation.

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ABSTRACT

PURPOSE:

To assess the incidence, clinical features and predictive risk factors of subretinal fibrosis after treatment of active myopic choroidal neovascularisation (mCNV) with anti-vascular endothelial growth factor (VEGF).

METHODS:

This post-hoc analysis of a randomised controlled trial included a total of 54 patients with active mCNV. The clinical data at baseline, month 3 and month 12 were used. Fundus photography and optical coherence tomography at month 3 were used to determine the presence of subretinal fibrosis after anti-VEGF therapy, and its incidence was calculated. Best-corrected visual acuity (BCVA), Visual Function Questionnaire−25 score, macular integrity index (MI) and their changes were compared between eyes with and without subretinal fibrosis. A logistic regression model was used to evaluate the risk factors of subretinal fibrosis.

RESULTS:

Subretinal fibrosis occurred in 22 of 54 eyes with mCNV. Patients with subretinal fibrosis achieved similar BCVA improvement in comparison with those without fibrosis at 3 and 12 months after the treatment; however, they had lower visual acuity, more subfoveal CNV (p=0.002), higher CNV thickness at baseline (p=0.016), larger CNV size (p=0.030), larger leakage area (p=0.021) and higher presence of advanced myopic maculopathy (p=0.035). Age <45 years, BCVA <60 ETDRS letters, and MI index <20 at baseline were the predictors for subretinal fibrosis occurrence in a logistic regression model.

CONCLUSION:

The incidence of subretinal fibrosis after anti-VEGF therapy was 40.7% in eyes with mCNV. Age, baseline BCVA and MI index could serve as predictive risk factors of subretinal fibrosis after anti-VEGF treatment in patients with mCNV.

RAP study, report 1: novel subtype of macular neovascularisation type III, cilioretinal MNV3.

Najeeb BH, Deak GG, Schmidt-Erfurth UM, Gerendas BS

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ABSTRACT

PURPOSE:

To report on patients with macular neovascularisation type III (MNV3) arising from cilioretinal arteries (CRAs) (cilioretinal macular neovascularisation type III (cMNV3)).

METHODS:

We reviewed baseline examinations of patients with neovascular age-related macular degeneration using multimodal imaging. We determined the type and distribution of MNV lesions in each cMNV3 case, the range of distances from the fovea, existence of exudative maculopathy, intraretinal haemorrhage and other morphological characteristics. 50 consecutive eyes with usual MNV3 without CRA were included as a control group.

RESULTS:

102 eyes of 102 patients were identified with MNV3 lesions. Among these, we found 12 eyes (12%) with cMNV3, 84 eyes (82%) with usual MNV3 without CRA and 6 eyes (6%) with usual MNV3 with CRA. Ten cases of cMNV3 had one lesion, and two cases had two lesions. The lesions were distributed equally between the superior and inferior halves of the macula, whereas in the nasal and temporal halves, there were 8 (57%) and 6 (43%) lesions, respectively. All cMNV3 lesions were located between 500 and 1500 µm from the central fovea except one, which was located between 1500 and 3000 µm. None of the lesions had macular neovascularisation type I (MNV1) or macular neovascularisation type II (MNV2) elsewhere in both groups. Exudative maculopathy and intraretinal haemorrhage were found in seven (88%) and five (63%) of the eight pure cMNV3 cases, respectively.

CONCLUSION:

cMNV3 can be solitary or multiple, isolated or accompanied with usual MNV3 lesions, but not with concurrent MNV1 or MNV2. It is frequently associated with extensive exudative maculopathy, intraretinal haemorrhage and subretinal fluid.

Long-Term Outcomes of Treatment with Biological Agents in Eyes with Refractory, Active, Noninfectious Intermediate Uveitis, Posterior Uveitis, or Panuveitis.

Al-Janabi A, El Nokrashy A, Sharief L, Nagendran V, Lightman S, Tomkins-Netzer O,

Ophthalmology 2020 Mar;127(3):410-416. doi: 10.1016/j.ophtha.2019.08.031. Epub 2019 Sep 6

ABSTRACT

PURPOSE:

To examine a large cohort of patients treated with biologic agents for active noninfectious intermediate uveitis, posterior uveitis, or panuveitis (NIPPU) and to compare their efficacy and long-term effect.

DESIGN:

Retrospective, longitudinal study.

PARTICIPANTS:

Eighty-two patients (156 eyes) with active NIPPU after failure of treatment with corticosteroids and a second-line immunosuppression drug and treated with biologic agents who were treated at Moorfields Eye Hospital between 2001 and 2016.

METHODS:

Information was gathered from the clinical notes of all patients.

MAIN OUTCOME MEASURES:

Time to first disease flare, rate of treatment failure, best-corrected visual acuity, and risk factors for treatment failure.

RESULTS:

Patients were followed on average for 4.7±0.4 years (724 eye-years). All patients demonstrated active uveitis at baseline, and 34 patients (41.5%) demonstrated a coexisting active systemic disease. Control of ocular inflammation was achieved in 136 eyes (87.2%). The average oral prednisolone dose at baseline was 16.4±1.7 mg/day, and by 6 months reduced to 6.5±0.7 mg/day ($P < 0.0001$), remaining stable for up to 5 years follow-up. Best-corrected visual acuity at baseline was 0.5±0.1 logarithm of the minimum angle of resolution (logMAR), improved to 0.4±0.1 logMAR ($P = 0.008$) at 3 months, and remained stable during follow-up. After

baseline, 42.3% of eyes experienced flares, and the average number of flares reduced from 1.8±0.1 flares/year to 0.6±0.1 flares/year (P < 0.0001). Median time to first flare was 5.4 years (95% confidence interval [CI], 2.2–5.4 years) with a 5-year survival rate of 58.7%. Treatment failed in 37 eyes (23.7%), with a 5-year survival rate of 68.0% and an estimated time to 75% survival of 2.9 years (95% CI, 2.1–4.4 years). The risk for treatment failure was lower when treatment used adalimumab (odds ratio, 0.4; 95% CI, 0.2–0.9; P = 0.03) but was greater when systemic disease also was active at baseline (odds ratio, 3.2; 95% CI, 1.5–7.1; P = 0.004).

CONCLUSION:

Overall, eyes treated with biologic agents after failure of treatment with corticosteroids and a second-line immunosuppression drug experienced satisfactory disease control (87.2%), reduced use of systemic immunosuppression, stable visual acuity, and a 23.7% risk of disease relapse. After multivariate adjustment, older age, treatment with adalimumab (versus infliximab), and inactive concomitant systemic disease were associated with a lower risk of treatment failure.

Incomplete Retinal Pigment Epithelial and Outer Retinal Atrophy in Age-Related Macular Degeneration.

Classification of Atrophy Meeting Report 4

Guymer RH, Rosenfeld PJ, Curcio CA, Holz FG, Staurenghi G, K. Bailey Freund KB et al.

Ophthalmology Mar;127(3):394-409. doi: 10.1016/j.ophtha.2019.09.035. Epub 2019 Sep 30.

ABSTRACT

PURPOSE:

To describe the defining features of incomplete retinal pigment epithelium (RPE) and outer retinal atrophy (iRORA), a consensus term referring to the OCT-based anatomic changes often identified before the development of complete RPE and outer retinal atrophy (cRORA) in age-related macular degeneration (AMD). We provide descriptive OCT and histologic examples of disease progression.

DESIGN:

Consensus meeting.

PARTICIPANTS:

Panel of retina specialists, including retinal imaging experts, reading center leaders, and retinal histologists.

METHODS:

As part of the Classification of Atrophy Meeting (CAM) program, an international group of experts analyzed and discussed longitudinal multimodal imaging of eyes with AMD. Consensus was reached on a classification system for OCT-based structural alterations that occurred before the development of atrophy secondary to AMD. New terms of iRORA and cRORA were defined. This report describes in detail the CAM consensus on iRORA.

MAIN OUTCOME MEASURES:

Defining the term iRORA through OCT imaging and longitudinal cases showing progression of atrophy, with histologic correlates.

RESULTS:

OCT was used in cases of early and intermediate AMD as the base imaging method to identify cases of iRORA. In the context of drusen, iRORA is defined on OCT as (1) a region of signal hypertransmission into the choroid, (2) a corresponding zone of attenuation or disruption of the RPE, and (3) evidence of overlying photoreceptor degeneration. The term iRORA should not be used when there is an RPE tear. Longitudinal studies confirmed the concept of progression from iRORA to cRORA

CONCLUSIONS:

An international consensus classification for OCT-defined anatomic features of iRORA are described and examples of longitudinal progression to cRORA are provided. The ability to identify these OCT changes reproducibly is essential to understand better the natural history of the disease, to identify high-risk signs of progression, and to study early interventions. Longitudinal data are required to quantify the implied risk of vision loss associated with these terms. The CAM classification provides initial definitions to enable these future endeavors, acknowledging that the classification will be refined as new data are generated.

Drusen subtypes and Choroidal characteristics in Asian eyes with typical Neovascular Age-related Macular Degeneration.

Lee J; Kim M; Lee CS; Kim SS, Koh HJ, Lee SC, Byeon SH

Retina 2020 Mar;40(3):490-498. doi: 10.1097/IAE.0000000000002419.

ABSTRACT

PURPOSE:

To investigate the prevalence of pachydrusen, soft drusen, and subretinal drusenoid deposits in eyes with different neovascular age-related macular degeneration (nAMD) subtypes, determine the relationship between each drusen type and the choroidal thickness, and analyze the distinct features of each nAMD subtype according to the drusen type.

METHODS:

Medical records involving 454 eyes from 454 patients with nAMD were retrospectively reviewed. The prevalence of each drusen type and the choroidal thickness and choroidal characteristics were evaluated according to the nAMD subtype.

RESULTS:

Pachydrusen were prevalent in the typical nAMD (40.4%) and polypoidal choroidal vasculopathy (47.8%) groups and were not detected in the retinal angiomatous proliferation group. No significant drusen were detected in 24.3% of typical nAMD, 43.3% of polypoidal choroidal vasculopathy, and 0% of retinal angiomatous proliferation groups. Regardless of the nAMD subtype, pachydrusen, soft drusen, and subretinal drusenoid deposits were associated with a thick, moderately thick, and thin choroid, respectively. For eyes with typical nAMD, the prevalence of choroidal vascular hyperpermeability and extrafoveal neovascularization was significantly higher in the pachydrusen group than in the other groups. By contrast, the prevalence of Type 2 neovascularization was significantly lower in the pachydrusen group than in the subretinal drusenoid deposit group ($P < 0.001$ for all).

CONCLUSION:

The prevalence of various drusen differed according to the nAMD subtypes, and each drusen type was strongly associated with the choroidal thickness. Typical nAMD showed distinct features according to the accompanying drusen type.

Long Term Results of Autologous Retinal Pigment Epithelium and Choroid transplantation for the Treatment of Exudative and Atrophic Maculopathies.

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Retina 2020 Mar;40(3):507-520. doi: 10.1097/IAE.0000000000002429.

ABSTRACT

PURPOSE:

To evaluate the long-term results of autologous retinal pigment epithelium (RPE) and choroid transplantation (RPE–choroid patch) for exudative and atrophic maculopathies.

METHODS:

Consecutive chart review of 120 eyes, which underwent RPE–choroid patch, from 2007 to 2017 for RPE atrophy or choroidal neovascular membrane secondary to exudative and hemorrhagic age-related macular degeneration, myopia, angioid streaks, and laser. Eyes were tested with best-corrected visual acuity (BCVA), reading ability, optical coherence tomography, fluorescein angiography and indocyanine green angiography, autofluorescence, and microperimetry.

RESULTS:

Eighty-eight eyes of 84 patients had complete data, with 2- to 10-year follow-up. Mean age was 71.9 ± 9.06 years. Mean preoperative and postoperative BCVA was 20/320 (1.2 ± 0.2 logMAR) and 20/200 (0.94 ± 0.36 logMAR), respectively (P = 0.009). Reading ability recovered in 43% of cases. Microperimetry showed central fixation. A gain of at least 15 letters was obtained in 40% of eyes. Integrity (P = 0.009) of external limiting membrane and higher preoperative BCVA (P = 0.001) predicted better final BCVA. Complications were retinal detachment (11.4%), macular atrophy (7%), subretinal hemorrhage (4.5%), epiretinal membrane (4.5%), recurrent choroidal neovascular membrane (4.5%), macular hole (3.4%), and cystoid edema (3%).

CONCLUSION:

Autologous RPE–choroid patch achieved long-lasting BCVA improvement and central fixation, in eyes with choroidal neovascular membrane and intact external limiting membrane. Atrophic maculopathies only obtained temporary visual benefit.

March Segment Compiled by : Dr. Mudit Tyagi, LVPEI Hyderabad