Retina Roundup
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Photodynamic Therapy for Circumscribed Choroidal Hemangioma in 79 Consecutive Patients: Comparative Analysis of Factors Predictive of Visual Outcome

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ABSTRACT

Purpose: To determine factors predictive of visual outcome in patients with circumscribed choroidal hemangioma treated with photodynamic therapy (PDT).

Design: Retrospective case series.

Participants: Seventy-nine patients with circumscribed choroidal hemangioma treated with PDT.

Methods: Patients with circumscribed choroidal hemangioma treated with PDT were identified, and factors predictive of final visual acuity were assessed.

Main outcome measures: Factors predictive of final visual acuity of 20/40 or better versus 20/50 or worse.

Results: Seventy-nine eyes of 79 patients with circumscribed choroidal hemangioma were treated with PDT. All tumors were unilateral and posterior to the equator. Mean largest basal diameter was 5.7 mm (range, 2.0-10.0 mm); mean thickness was 3.0 mm (range, 1.4-4.5 mm). A total of 116 PDT sessions were performed (mean, 1.5 sessions; range, 1.0-7.0 sessions). Standard duration PDT was used in most cases (83 seconds; n = 110/116 [95%]). Mean follow-up was 43 months. Of 79 patients, 49 (62%) demonstrated good visual acuity (≥20/40) and 30 (38%) showed intermediate to poor visual acuity

(≤20/50) after PDT. A comparison (final visual acuity, good vs. intermediate to poor) revealed a statistically significant difference in baseline features of photopsia (100% vs. 0%; P = 0.04), initial visual acuity of 20/40 or better (77% vs. 23%; P < 0.001), mean tumor basal diameter (5.4 mm vs. 6.2 mm; P = 0.03), mean tumor thickness (2.9 mm vs. 3.2 mm; P = 0.01), cystoid macular edema (CME) involving the foveola (30% vs. 70%; P = 0.001), retinal edema overlying the lesion (39% vs. 61%; P = 0.003), retinoschisis involving the foveola (0% vs. 100%; P = 0.002), lack of CME regardless of foveola involvement at presentation (79% vs. 21%; P < 0.001), previous treatment (33% vs. 67%; P = 0.04), and CME progression after treatment (0% vs. 100%; P = 0.006). Partial or complete resolution of subretinal fluid was achieved in 93% of patients.

Conclusions: In this comparative analysis, PDT was an effective treatment method for circumscribed choroidal hemangioma. Good final visual outcome (≥20/40) was correlated with good baseline visual acuity, smaller tumor size, lack of CME, and lack of treatment before PDT.

Vitreous Findings by Handheld Spectral-Domain OCT Correlate with Retinopathy of Prematurity Severity

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ABSTRACT

Purpose: To evaluate the association between retinopathy of prematurity (ROP) and vitreous findings in premature infants detected by handheld spectral-domain (SD) OCT.

Design: Prospective, observational cohort study.

Participants: Consecutive sample of 92 premature infants requiring ROP screening at 2 academic neonatal intensive care units between July 2015 and March 2018.

Methods: Infants underwent handheld SD OCT at the time of routine ROP examinations. Two masked, trained graders analyzed right-eye vitreoretinal findings, including semiautomated quantification of punctate hyperreflective vitreous opacities within 5 foveal or parafoveal B-scans (vitreous opacity ratio).

Main outcome measures: Excluding posttreatment data, vitreous findings were compared with clinical ROP diagnoses.

Results: Agreement between image graders for all vitreoretinal findings was 91% ($\kappa = 0.86$; 95% confidence interval, 0.82-0.90; $P < 0.001$). Among 92 infants undergoing 280 imaging sessions (52% male; mean gestational age, 28.3 ± 2.8 weeks; mean birthweight, 1014.5 ± 285.0 g), 36 of 92 (39%) demonstrated ROP. Punctate hyperreflective vitreous opacities were identified in 61 of 92 infants (66%). The presence of punctate hyperreflective vitreous opacities at

least once was associated with a diagnosis of ROP (62% vs. 29% without opacities; P = 0.003), maximum ROP stage (P = 0.001), preplus or plus disease (24% vs. 5%; P = 0.005), and type 1 disease (14% vs. 2%; P = 0.03). Among 29 infants (45 imaging sessions) with right-eye punctate hyperreflective vitreous opacities, the vitreous opacity ratio from 2 graders (F1 score, 0.82 ± 0.36; Dice coefficient, 0.97 ± 0.04) correlated with ROP stage (P = 0.02). Tractional vitreous bands on imaging correlated with plus disease status (29% vs. 5% without bands; P = 0.05).

Conclusions: Punctate hyperreflective vitreous opacities and tractional vitreous bands predict the presence and severity of ROP. Further studies should explore handheld OCT as a noninvasive ROP screening tool.

Frequency of Rhegmatogenous Retinal Detachment after Intravitreal Therapy in Neovascular Age-Related Macular Degeneration

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ABSTRACT

Purpose: To identify characteristics of neovascular age-related macular degeneration (nAMD) patients undergoing pars plana vitrectomy (PPV) after rhegmatogenous retinal detachment (RRD), including changes to injection intervals.

Design: Single-center retrospective, consecutive review.

Participants: All patients with RRD receiving anti-vascular endothelial growth factor treatment for nAMD from January 1, 2014, through October 30, 2018.

Methods: Billing codes were used to identify RRD that occurred within 90 days of a previous intravitreal injection for nAMD.

Main outcome measures: Outcome measures included the quadrant of the retinal break(s), visual acuity at the time of RRD and final follow-up, and postoperative injection frequency.

Results: An exact total of 203 000 intravitreal injections for nAMD were administered. Seventeen eyes from 17 patients demonstrated RRDs, giving a rate of 1 RRD per 11 941 intravitreal injections (0.0084%) within 90 days of intravitreal injection. Patients received a mean of 27.56 injections in the superotemporal quadrant before RRD. Of known retinal breaks, the superotemporal quadrant was involved most frequently (10 of 16 eyes [62.5%]). Six patients (35.3%) required a second surgery. Of patients requiring

postoperative injections, the average interval increased from 7.18 weeks to 9.17 weeks after surgery. Eleven of 17 patients (64.7%) either increased their injection intervals or required no further injections, 3 maintained similar intervals, and 3 decreased intervals. The average number of injections in the 6 months before RRD (n = 84) and the 6 months after the first injection after PPV (n = 47) was 4.94 ± 1.89 and 2.76 ± 2.44, respectively (P = 0.009).

Conclusions: Based on these results, the 90-day rate of RRD in nAMD patients receiving intravitreal injections is low. Rhegmatogenous retinal detachments in these patients may be more difficult to repair. Although many physicians worry about injection frequency in vitrectomized eyes because of a presumed increased medication clearance, this study found that most patients received fewer injections after surgery.

Evaluation of microvasculature alterations in convalescent Vogt-Koyanagi-Harada disease using optical coherence tomography angiography

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ABSTRACT

Purpose: To evaluate the microvasculature alterations in convalescent Vogt-Koyanagi-Harada (VKH) disease using optical coherence tomography angiography (OCTA), and to explore the association between microvasculature and the presence of sunset glow fundus (SGF).

Methods: A cross-sectional study was conducted with 28 VKH patients at convalescent stage and 25 healthy individuals. Both eyes of each participant were enrolled. The VKH patients were classified into two subgroups based on the existence of SGF. OCTA images (3 × 3 mm) were assessed for the data of superficial capillaris plexus (SCP), deep capillaris plexus (DCP), choriocapillaris, and foveal avascular zone (FAZ).

Results: Compared with healthy control eyes and eyes without SGF, the vessel densities of the SCP and DCP decreased significantly in most regions of eyes with SGF ($p < 0.0167$). No significant difference of vascular perfusion was found between eyes without SGF and control eyes ($p > 0.05$). VKH patients with SGF had slightly increased FAZ area ($p = 0.067$) and decreased choroid flow area ($p = 0.427$) than those in the control group.

Conclusion: Convalescent VKH patients with SGF showed decreased macular capillary perfusion. OCTA could serve as a sensitive tool to assess the microvasculature alterations of VKH disease.

Assessment of choriocapillary blood flow changes in response to half-dose photodynamic therapy in chronic central serous chorioretinopathy using optical coherence tomography angiography

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ABSTRACT

Background: Optical coherence tomography angiography (OCTA) is a newly developed imaging quantitative technique for analysis of choriocapillaris (CC) flow changes, thereby exploring the pathological mechanism of chronic central serous chorioretinopathy (CCSC) and the therapeutic effects of photodynamic therapy (PDT). In this study, we sought to quantify the blood flow changes in CC of CCSC patients receiving half-dose PDT using OCTA.

Methods: A total of 28 affected eyes and 24 unaffected eyes of 26 CCSC patients receiving half-dose PDT, and 40 eyes of 20 healthy gender- and age-matched subjects were retrospectively enrolled in this study. The proportion of total areas of flow signal voids (FSV, %) in CC level of OCTA was assessed in both eyes of the CCSC patients at baseline and repeated in multiple sections at 1-week, 1-month, 3-month and 6-month intervals after PDT. In addition, the CC patterns in response to PDT at early stage and the subsequent morphologic changes were qualitatively documented using OCTA.

Results: For affected eyes, FSV at 6-m follow-up was significantly lower than that at 1-m follow-up ($p = 0.036$). When compared to normal control eyes, FSV in affected eyes was significantly higher at 1-m, 3-m and 6-m follow-up ($p < 0.05$ for all), and FSV in unaffected eyes was significantly higher at baseline, 1-w, 1-m and 3-m follow-up ($p < 0.05$ for all). Three CC patterns of early response to PDT were identified, including signs of recovery with more even flow signals,

transient appearance of worse ischemia and secondary neovascularization within CC level.

Conclusion: Abnormal CC flow attenuation remains in completely resolved eyes of CCSC patients treated with half-dose PDT.

Cilioretinal Arteries and Macular Vasculature in Highly Myopic Eyes: An OCT Angiography-Based Study

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ABSTRACT

Purpose: To determine the association between the presence of cilioretinal arteries and the macular vasculature in highly myopic eyes using OCT angiography (OCTA).

Design: Retrospective, observational case series.

Participants: Four hundred eighty-one highly myopic eyes of 481 patients.

Methods: Fundus photographs were reviewed to determine the presence of a cilioretinal artery and its distribution, based on whether its path or visible branches reached the region within 500 μm of the foveal center. The macular vasculature was analyzed in OCTA images, including the vessel density (VD), fractal dimension (FD), and foveal avascular zone (FAZ). The associations between the presence of a cilioretinal artery and its distribution and between the macular vasculature and visual acuity were evaluated.

Main outcome measures: Cilioretinal arteries, macular vasculature, and their associations.

Results: Of the eyes included, 17.05% (82/481) had a cilioretinal artery. Based on the OCTA analysis, the eyes with cilioretinal arteries showed significantly higher VD and FD in both superficial and deep capillary plexuses and smaller FAZ than those without (all $P < 0.001$). However, these differences were not found in the subgroup of eyes with an axial length of more than 30 mm. Eyes with cilioretinal arteries that reached the central foveal area showed significantly higher VD and FD in both capillary plexuses and smaller FAZ than those that did not (all $P < 0.05$). Better best-corrected visual acuity was

identified in the eyes with cilioretinal arteries than in those without (0.09 ± 0.14 logarithm of the minimum angle of resolution [logMAR] vs. 0.21 ± 0.27 logMAR, respectively; P < 0.001). In particular, eyes with cilioretinal arteries that reached the central foveal area had better visual acuity than those without (0.05 ± 0.06 logMAR vs. 0.16 ± 0.20logMAR, respectively; P = 0.005).

Conclusions: This OCTA-based study suggested that cilioretinal arteries in highly myopic eyes potentially may improve the macular vasculature and influence visual function.

Autologous Retinal Transplantation for Primary and Refractory Macular Holes, and Macular Hole Retinal Detachments: The Global Consortium

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ABSTRACT

Purpose: To report the anatomical and functional outcomes of autologous retinal transplantation (ART).

Design: Multicenter, retrospective, interventional, consecutive case series.

Participants: 130 eyes of 130 patients undergoing ART for the repair of primary and refractory macular holes, as well as combined macular hole-rhegmatogenous retinal detachments (MH-RRD), between January 2017 and December 2019.

Methods: All patients underwent pars plana vitrectomy and ART, with surgeon modification of intraoperative variables. A large array of preoperative, intraoperative, and post-operative data was collected. Two masked reviewers graded optical coherence tomography (OCT) images. Multivariate statistical analysis and subgroup analysis were performed.

Main outcome measures: Macular hole closure rate, best corrected visual acuity (VA), external limiting membrane, ellipsoid zone (EZ) integrity, and alignment of neurosensory layers (ANL) on OCT.

Results: 130 ART surgeries were performed by 33 vitreoretinal surgeons worldwide. Patient demographics were: mean age 63±6.3 years, 58% females, 41% Caucasian, 23% African, 19% Asian, and 17% Latino. Preoperative logMAR VA was 1.37±0.12 (~20/500), which improved significantly to 1.05±0.09 (about

20/225; p<0.001) postoperatively (mean follow-up 8.6±0.8 months). ART was performed for primary macular hole repair in 27% of cases (n=35), for refractory macular holes in 58% of cases (n=76; mean number of previous surgeries 1.6±0.2), and MH-RRD in 15% of cases (n=19). Mean maximum macular hole diameter was 1470±160 µm, mean minimum diameter was 840±94 µm, and mean axial length was 24.6±3.2 mm. Overall, 89% of macular holes closed (78.5% complete, 10% small eccentric defect), with a 95% closure rate in MH-RRD (68.4% complete, 26.3% small eccentric defect). VA improved by at least 3 lines in 43% of eyes and at least 5 lines in 29%. Reconstitution of the EZ (p=0.02) and ANL (p=0.01) on OCT were associated with better final VA. There were 5 cases of ART graft dislocation (3.8%), 5 cases of postoperative retinal detachment (3.8%), and 1 case of endophthalmitis (0.77%).

Conclusion: In this global experience, patients undergoing ART for large, primary and refractory macular holes, and MH-RRDs, achieved good anatomical and functional outcomes, with low complication rates despite complex surgical pathology.

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