A Spectrum of Regression Following Intravitreal Bevacizumab in Retinopathy of Prematurity.

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ABSTRACT

PURPOSE:

To describe an improved understanding of the regression patterns following off-label intravitreal bevacizumab (IVB) treatment for retinopathy of prematurity (ROP).

DESIGN:

Retrospective cohort study.

METHODS:

All infants treated with IVB for type 1 ROP at a single institution from June 2013 to March 2018 were retrospectively reviewed and the amount of retinal nonperfusion on fluorescein angiogram was calculated.

RESULTS:

In the 92 eyes of 46 patients analyzed, only 3 eyes (3.3%) reached full vascular maturity. Of the 89 eyes not reaching maturity, 39 eyes (43.8%) had vascular arrest alone (VAA), 34 eyes (38.2%) had vascular arrest with persistent tortuosity (VAT), and 16 eyes (18.0%) had ROP reactivation. Those eyes that reactivated were more likely to be initially classified as having aggressive posterior ROP (P = .004) and of Asian ethnicity (P = .008). There were greater areas of ischemia in eyes with reactivation as compared to VAT and VAA (112.1 mm^2 vs 72.5 mm^2 vs 56.6 mm^2, respectively, P = .007). Younger gestational age at birth was found to be an independent predictor of persistent tortuosity (VAT vs VAA) in a logistic regression model.

CONCLUSIONS:

Incomplete vascularization following IVB is very common and is associated with a younger gestational age at birth, Asian ethnicity, and aggressive posterior ROP. The presence of tortuosity following IVB may be indicative of persistently elevated vascular endothelial growth factor levels and an early indicator of potential reactivation.

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Predictive Factors of Response to Mineralocorticoid Receptor Antagonists in Nonresolving Central Serous Chorioretinopathy.

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ABSTRACT

PURPOSE:
To assess the efficacy and safety of mineralocorticoid receptor antagonists (MRAs) in the treatment of nonresolving central serous chorioretinopathy (CSC) and to identify factors that are predictive of treatment response.

DESIGN:
Retrospective, multicenter, noncomparative, interventional case series.

METHODS:
Clinical and imaging data from consecutive patients with nonresolving CSC treated with eplerenone or spironolactone for 3 to 6 months between 2012 and 2016 were reviewed. Outcome measures included the resolution of foveal subretinal detachment (SRD), changes in SRD height, central macular thickness, subfoveal choroidal thickness, best corrected visual acuity, and the occurrence of adverse events assessed at 3 and 6 months. The response to treatment was defined by a decrease by >50% in SRD height under treatment. Comparisons between responder and nonresponder groups were performed using univariate and multivariate regression analyses to identify factors that were predictive of treatment response.

RESULTS:
Fifty-nine patients (64 eyes) were included. The mean SRD height and central macular thickness significantly decreased while the mean best corrected visual acuity significantly improved at 3 and 6 months. The mean subfoveal choroidal thickness significantly decreased at 3 months. Among the 64 eyes included, 67.2% responded to treatment, among which 38.3% and 40.5% had a complete resolution of the foveal SRD at 3 and 6 months, respectively. Baseline subfoveal choroidal thickness was the only factor associated with a treatment response in the multivariate analysis.

CONCLUSION:
Our study suggests that MRA could be a safe and effective treatment in patients with nonresolving CSC. MRA treatment is more effective in cases with a thicker baseline choroid.

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Macular Morphology and Visual Acuity in Year Five of the Comparison of Age-related Macular Degeneration Treatments Trials.

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ABSTRACT

PURPOSE:
To evaluate associations of morphologic features with 5-year visual acuity (VA) in the Comparison of Age-related Macular Degeneration Treatments Trials (CATT).

DESIGN:
Cohort study within a randomized clinical trial.

PARTICIPANTS:
Participants in CATT.

METHODS:
Eyes with age-related macular degeneration-associated choroidal neovascularization (CNV) and VA between 20/25 and 20/320 were eligible. Treatment was assigned randomly to ranibizumab or bevacizumab and to 3 dosing regimens for 2 years and was at the ophthalmologists' discretion thereafter.

MAIN OUTCOME MEASURES:
Visual acuity, thickness and morphologic features on OCT, and lesion size and foveal composition on fundus photography (FP) and fluorescein angiography (FA).

RESULTS:
Visual acuity and image gradings were available for 523 of 914 participants (57%) alive at 5 years. At 5 years, 60% of eyes had intraretinal fluid (IRF), 38% had subretinal fluid (SRF), 36% had subretinal pigment epithelium (RPE) fluid, and 66% had subretinal hyper-reflective material (SHRM). Mean (standard deviation) foveal center thickness was 148 µm (99) for retina, 5 µm (21) for SRF, 125 µm (107) for subretinal tissue complex, 11 µm (33) for SHRM, and 103 µm (95) for RPE + RPE elevation. The SHRM, thinner retina, greater CNV lesion area, and foveal center pathology (all $P < 0.001$) and IRF ($P < 0.05$) were independently associated with worse VA. Adjusted mean VA letters were 62 for no pathology in the foveal center; 61 for CNV, fluid, or hemorrhage; 65 for non-geographic atrophy (GA); 64 for nonfibrotic scar; 53 for GA; and 56 for fibrotic scar. Incidence or worsening of 8 pathologic features (foveal GA, foveal scar, foveal CNV, SHRM, foveal IRF, retinal thinning, CNV lesion area, and GA area) between years 2 and 5 was independently associated with greater loss of VA from years 2 to 5 and VA loss from baseline to year 5.

CONCLUSIONS:
Associations between VA and morphologic features previously identified through year 1 were maintained or strengthened at year 5. New foveal scar, CNV, intraretinal fluid, SHRM and retinal thinning, development or worsening of foveal GA, and increased lesion size are important contributors to the VA decline from years 2 to 5. A significant need to develop therapies to address these adverse pathologic features remains.

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LONGITUDINAL CHANGES IN EYES WITH HYDROXYCHLOROQUINE RETINAL TOXICITY.

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ABSTRACT

PURPOSE:
To characterize functional and structural changes in hydroxychloroquine (HCQ) retinal toxicity after drug cessation.

METHODS:
Twenty-two patients (91% female; mean age 58.7 ± 11.4 years; mean duration of HCQ treatment 161.1 ± 90 months; mean dose 5.9 ± 1.9 mg/kg) with detected HCQ retinopathy were monitored for 6 months to 82 months after HCQ cessation with multimodal imaging including spectral domain optical coherence tomography and fundus autofluorescence imaging at 488 nm (standard) and 787 nm (near-infrared autofluorescence). Tests of visual function including visual acuity, Humphrey visual field testing, and multifocal electroretinography (mfERG) were performed. Study eyes were categorized into four separate severity stages by qualitative grading of spectral domain optical coherence tomography macular scans taken at the time of HCQ cessation. Changes in outcome measures between drug cessation and last follow-up visit were computed and compared between eyes of different severity stages.

RESULTS:
Study eyes (n = 44) were categorized based on optical coherence tomography criteria into: Stage 1 (subtle changes confined to parafoveal region; n = 14), Stage 2 (clear localized changes in parafovea; n = 17), Stage 3 (extensive parafoveal changes; n = 7), and Stage 4 (foveal involvement, n = 6). Visual acuity measurements across follow-up were stable in Stage 1 and Stage 2 eyes but decreased significantly in Stage 3 and 4 eyes. Humphrey visual field measures were also stable in stages 1 and 2 but deteriorated in Stage 3 eyes. mfERG testing demonstrated significant improvement in the R1/R2 ratio after HCQ cessation in Stage 1 eyes (mean change = -0.86 ± 0.79, P = 0.03) but did not change significantly in eyes of higher stages. Decreases in macular thickness in ≥1 of 9 Early Treatment Diabetic Retinopathy Study subfields on spectral domain optical coherence tomography were found in eyes of all stages, with Stage 2 eyes demonstrating thinning in most subfields (eight of nine subfields). In eyes with a measurable central foveal ellipsoid zone band island (9 of 17 Stage 2 eyes and 7 of 7 Stage 3 eyes), progressive decrease in the foveal ellipsoid zone band length was observed in 6 of 9 (67%) Stage 2 eyes and 6 of 7 (86%) Stage 3 eyes. Changes indicative of progressing retinopathy were detected in 17% of Stage 1 eyes, 46% of Stage 2 eyes, and 43% of Stage 3 eyes on standard fundus autofluorescence imaging, and in 17% of Stage 1 eyes, 38% of Stage 2 eyes, and 14% of Stage 3 eyes on near-infrared autofluorescence imaging.

CONCLUSION:
Eyes with detected HCQ retinopathy do not demonstrate general stability in retinal structure and function after HCQ cessation but instead demonstrate a range of changes during follow-up whose magnitudes correlate with retinopathy severity at the time of cessation. After cessation, eyes with only subtle and localized retinopathy were mostly stable and may show some functional improvement, whereas more severely affected eyes continued to progress. These findings provide evidence that early detection and prompt cessation in HCQ retinopathy may be needed to arrest retinopathy progression and to optimize long-term outcomes.

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EFFICACY OF DOUBLE DOSE PHOTODYNAMIC THERAPY FOR CIRCUMSCRIBED CHOROIDAL HEMANGIOMA.

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ABSTRACT

PURPOSE:
To evaluate the efficacy of photodynamic therapy using a double dose of verteporfin for patients with circumscribed choroidal hemangioma.

METHODS:
This retrospective comparative case series evaluated data from 10 patients who were treated using double dose photodynamictherapy (12 mg/m) and seven patients who were treated using the standard dose (6 mg/m). A laser was applied with a radiant exposure of 50 J/cm. The ophthalmologic examinations were performed at baseline and 1 year after the treatment and included best-corrected visual acuity, slit-lamp biomicroscopy, fundus examination, spectral domain optical coherence tomography, and B-scan ultrasonography.

RESULTS:
The mean age in the double dose group was 51.60 years, compared with 50.57 years in the standard-dose group. The only significant difference between the two groups' baseline characteristics was observed in their initial tumor heights. Foveal center thickness, subretinal fluid, and subfoveal choroidal thickness decreased significantly at 1 year after treatment in both groups. Tumor height and the greatest linear dimension of the tumor's base only decreased significantly in the double dose group (P = 0.031). Both groups did not experience significant visual improvements.

CONCLUSION:
Double dose photodynamic therapy was effective and safe for treating circumscribed choroidal hemangioma and provided better tumor regression with similar resorption of subretinal fluid, compared with standard-dose photodynamic therapy.

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OUTCOME OF INTRAVITREAL AFLIBERCEPT FOR REFRACTORY PIGMENT EPITHELIAL DETACHMENT WITH OR WITHOUT SUBRETINAL FLUID AND SECONDARY TO AGE-RELATED MACULAR DEGENERATION.

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ABSTRACT

PURPOSE:
To investigate the outcomes of intravitreal aflibercept in refractory pigment epithelial detachment (PED) with or without subretinal fluid (SRF) in patients with neovascular age-related macular degeneration.

METHODS:
A prospective, nonrandomized, interventional case series involved 40 patients with persistent vascularized PED previously treated with at least 3 injections of intravitreal bevacizumab or ranibizumab. Intravitreal aflibercept was administered as 3 initial loading doses every 4 weeks, followed by pro re nata retreatment every 8 weeks over 48 weeks. Pigment epithelial detachment was classified into solid-, hollow-, or mixed-type according to the reflective properties visualized using optical coherence tomography. The mean changes in best-corrected visual acuity, central subfield thickness, and the volumes of SRF and PED were analyzed.

RESULTS:
The PED volume (baseline: 0.43 ± 0.55 mm) significantly reduced to 0.23 ± 0.32 mm at Week 8 (P = 0.003) and increased to 0.36 ± 0.41 mm at Week 48 (P = 0.345). The SRF volume (baseline: 0.52 ± 0.64 mm) significantly reduced to 0.24 ± 0.43 mm at Week 48 (P = 0.021). The mean baseline best-corrected visual acuity was 20/75 (47.5 letters); it showed no significant difference at Week 48 (+4.4 letters; P = 0.125). The baseline central subfield thickness was 323.2 ± 92.3 µm; it significantly reduced to 281.2 ± 90.7 µm at Week 48 (P = 0.001). In solid-type PEDs, there were poorer improvements in central subfield thickness, best-corrected visual acuity, and the volumes of the SRF and PED, with newly developed intraretinal cysts.

CONCLUSION:
Intravitreal aflibercept in treatment-resistant neovascular age-related macular degeneration led to significant reduction in PEDand SRF volume, central subfield thickness, and best-corrected visual acuity preserved, over 12 months. However, solid-type PED showed less improvement than hollow- or mixed-type PED.

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OPTICAL COHERENCE TOMOGRAPHY 2: Diagnostic Tool to Study Peripheral Vitreoretinal Pathologies.

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ABSTRACT

PURPOSE:
To investigate the utility of new wide-field optical coherence tomography (OCT) device in the evaluation of mid and far retinal periphery and to show its feasibility and advantages in clinical practice.

METHODS:
Consecutive patients underwent a complete ophthalmologic examination including standard OCT and new prototype OCT2derived from Heidelberg Spectralis.

RESULTS:
Thirty-one eyes of 31 patients were studied with a total of 44 lesions, including 18 retinal detachments, 15 retinal holes and tears, 9 retinoschisis, and 2 retinal tufts. Fourteen (32%) lesions were found in mid and 30 (68%) in far periphery with 9 (20%) lesions in the superior region, 10 (23%) in the superior temporal, 8 (18%) in the temporal, 4 (9%) in the inferior temporal, 7 (16%) in the inferior, 4 (9%) in the nasal, and 2 (5%) in the superior nasal. Among the lesions evaluated by OCT2, 10 (71%) in mid periphery and 11 (37%) in far periphery could be imaged by standard OCT.

CONCLUSION:
The introduction of OCT2 into clinical practice may provide significant benefits for imaging peripheral retinal disorders. The application of OCT2 technology with 55° lens and scan length and angle modulation could improve our understanding of peripheral vitreoretinal disorders and facilitate their management.

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