Retina Roundup
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FUNCTIONAL AND STRUCTURAL EFFECTS OF NONDAMAGING RETINAL LASER THERAPY FOR MACULAR TELANGIECTASIA TYPE 2: A Randomized Sham-Controlled Clinical Trial

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Abstract

Purpose:

Macular telangiectasia (MacTel) Type 2 is a progressing neurovascular disease of the macula, currently lacking effective treatment. This study assessed the effect of nondamaging retinal laser therapy (NRT) compared with sham.

Methods:

Twelve MacTel patients were enrolled in this double-masked, controlled, randomized clinical trial. For the nine patients with both eyes eligible, one eye was randomized to NRT or sham and the other received alternate treatment. For three patients with only one eye eligible, that eye was randomly assigned either NRT or sham. Ellipsoid zone disruption, best-corrected visual acuity, and macular automated perimetry at 12 months served as structural and functional measures.

Results:

Eleven eyes were randomized to sham and 10 to NRT. Baseline best-corrected visual acuity was 66 letters (20/50) for sham and 72 letters (20/40) for NRT ($P = 0.245$). Ellipsoid zone disruption area was 298 µm2 in sham and 368 µm2 in NRT ($P = 0.391$). At 12 months, ellipsoid zone disruption increased by 24% in sham and decreased by 34% in NRT ($P < 0.001$). Best-corrected visual acuity measures remained stable during follow-up compared with baseline. At 1 year, the mean macular sensitivity was 28 dB in the NRT group, compared with 26 dB in sham.

Conclusion:

Non damaging retinal laser therapy was safe and well tolerated in patients with MacTel and resulted in structural and functional improvements, which could represent a protective effect of laser-induced hyperthermia. Longer follow-up and larger number of patients should help corroborate these effects.

OCT Risk Factors for 3-Year Development of Macular Complications in Eyes With "Resolved" Chronic Central Serous Chorioretinopathy

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Abstract

Purpose:

To assess the relationship between demographics, clinical characteristics, and structural optical coherence tomography (OCT) findings and the development of sight-threatening macular complications (choroidal neovascularization [CNV], large areas of retinal pigment epithelium [RPE] atrophy, and cystoid macular degeneration [CMD]) in a cohort of eyes with "resolved" chronic central serous chorioretinopathy (CSC) at study baseline.

Design:

Retrospective cohort study.

Methods:

In this study, a total of 71 eyes with "resolved" (absence of subretinal fluid) chronic CSC at baseline and 36 months of regular follow-up examinations were retrospectively enrolled. Structural OCT scans were reviewed. Baseline OCT qualitative features reflecting distress of the neuroretina, RPE, or choroid were assessed and included ellipsoid zone discontinuity, outer nuclear layer (ONL) thinning; presence of hyper-reflective intraretinal foci; dome-shaped pigment epithelium detachment (PED); hyper-reflective flat, irregular PED; hyporeflective flat, irregular PED; and inner choroidal attenuation. OCT images obtained at follow-up visits were also reviewed for development of macular complications (CNV, large areas of RPE atrophy [at least 250 μm in diameter], and CMD). Main outcome measurements included incidence of macular complications and hazard ratio (HR) for demographics, clinical characteristics, and OCT risk factors.

Results:

At month 36, 20 eyes (28.2%) developed macular complications. Nine eyes (12.7%) displayed CNV, 9 eyes (12.7%) had large areas of RPE atrophy, and 2 eyes (2.8%) developed cystoid macular degeneration.

The following factors were associated with an increased risk of development of CNV: intraretinal hyper-reflective foci had an HR of 11.58 (95% confidence interval [CI]: 1.10-37.24; P = .040); inner choroidal attenuation had an HR of 9.66 (95% CI: 1.07-22.34; P = .043); and the presence of macular complications in the fellow eye had an HR of 20.17 (95% CI: 1.34-39.41; P = .030). Factors associated with the development of RPE atrophy were also identified: ONL thinning had an HR of 13.47 (95% CI: 1.10-39.86; P = .042); dome-shaped PED had an HR of 21.40 (95% CI: 1.50-41.10; P = .031); and inner choroidal attenuation had an HR of 13.20 (95% CI: 1.07-39.32; P = .044).

Conclusions:

OCT risk factors were identified for the development of macular complications in eyes with chronic CSC. Findings may help in the identification of high-risk patients.

Nasal or Temporal Internal Limiting Membrane Flap Assisted by Sub-Perfluorocarbon Viscoelastic Injection for Macular Hole Repair

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Abstract

Purpose:

To compare the outcomes between using a nasal and a temporal inverted internal limiting membrane (ILM) flap both assisted by a novel technique in repairing a full-thickness macular hole (FTMH).

Design:

Retrospective interventional case series.

Methods:

Thirty-nine eyes from 39 patients with a FTMH <600 μm were included from a single institution. All patients underwent vitrectomy using a semicircular single-layered ILM inverted flap assisted by a sub-perfluorocarbon liquid injection of ophthalmic viscoelastic device (OVD) technique. Best-corrected visual acuity (BCVA) and spectral domain optical coherence tomography were used to compare outcomes between nasal (n = 19) and temporal (n = 20) groups.

Results:

At 6 months postoperatively, all FTMHs closed and BCVA were significantly improved. Overall, 36 eyes (92%) achieved U-shaped closure, and ellipsoid zone restoration was noted in 24 eyes (62%). An ILM flap was present in 29 eyes (74%) and 86% remained single-layered. There were significantly more deep inner retinal dimples in the temporal group (35%) compared with 5% in the nasal group (P = .04), but these were unrelated to BCVA. Significant retinal thinning in the temporal outer sub-field was noted in the temporal group and was negatively correlated with BCVA (rho [ρ]: - .53; P = .03). No significant postoperative retinal displacement was noted in either group.

Conclusions:

The technique of using sub-perfluorocarbon liquid injection of OVD secured single-layered flaps intraoperatively and postoperatively. Both the nasal and temporal inverted ILM flaps repaired FTMH and improved visual acuity. However, both temporal macular thinning and deep inner retinal dimples were significantly greater in the temporal group.

Polypoidal Choroidal Vasculopathy: Consensus Nomenclature and Non-Indocyanine Green Angiograph Diagnostic Criteria from the Asia-Pacific Ocular Imaging Society PCV Workgroup

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Ophthalmology. 2021 Mar;128(3):443-452.doi: 10.1016/j.ophtha.2020.08.006. PMID: 32795496

Abstract

Purpose:

To develop consensus terminology in the setting of polypoidal choroidal vasculopathy (PCV) and to develop and validate a set of diagnostic criteria not requiring indocyanine green angiography (ICGA) for differentiating PCV from typical neovascular age-related macular degeneration (nAMD) based on a combination of OCT and color fundus photography findings.

Design:

Evaluation of diagnostic test results.

Participants:

Panel of retina specialists.

Methods:

As part of the Asia-Pacific Ocular Imaging Society, an international group of experts surveyed and discussed the published literature regarding the current nomenclature and lesion components for PCV, and proposed an updated consensus nomenclature that reflects our latest understanding based on imaging and histologic reports. The workgroup evaluated a set of diagnostic features based on OCT images and color fundus photographs for PCV that may distinguish it from typical nAMD and assessed the performance of individual and combinations of these non-ICGA features, aiming to propose a new set of diagnostic criteria that does not require the use of ICGA. The final recommendation was validated in 80 eyes from 2 additional cohorts.

Main outcome measures:

Consensus nomenclature system for PCV lesion components and non-ICGA-based criteria to differentiate PCV from typical nAMD.

Results:

The workgroup recommended the terms polypoidal lesion and branching neovascular network for the 2 key lesion components in PCV. For the diagnosis of PCV, the combination of 3 OCT-based major criteria (sub-retinal pigment epithelium [RPE] ring-like lesion, en face OCT complex RPE elevation, and sharp-peaked PED) achieved an area under the receiver operating characteristic curve of 0.90. Validation of this new scheme in a separate subset 80 eyes achieved an accuracy of 82%.

Conclusions:

We propose updated terminology for PCV lesion components that better reflects the nature of these lesions and is based on international consensus. A set of practical diagnostic criteria applied easily to spectral-domain OCT results can be used for diagnosing PCV with high accuracy in clinical settings in which ICGA is not performed routinely.

Keywords:

Accuracy; Aneurysmal; Angiography; Diagnosis; Differentiation; Imaging; Neovascularization; Noninvasive; OCT; Polypoidal choroidal vasculopathy; Screening; Sensitivity and specificity.

Ultra-Response to Ranibizumab: Improvement by 4 or More Steps in Diabetic Retinopathy Severity in Diabetic Retinopathy Clinical Research Network Protocol S

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Abstract

Purpose:

To quantify and evaluate patients with diabetic retinopathy (DR) who had at least a 4-step improvement on the Early Treatment Diabetic Retinopathy Study (ETDRS) Diabetic Retinopathy Severity Scale (DRSS) in response to treatment with ranibizumab in the Diabetic Retinopathy Clinical Research Network (DRCR.net) Protocol S study, and factors predictive of such improvements.

Design:

Post hoc retrospective analysis of 2-year outcomes in the phase 3 Protocol S study.

Participants:

Patients randomized to treatment with ranibizumab 0.5 mg with sufficient baseline DRSS severity (≥47) to allow for an at least 4-step improvement (n = 181).

Methods:

Study eyes received a ranibizumab 0.5 mg injection at baseline and every 4 weeks for 12 weeks, with subsequent as-needed injections. Fundus photographs graded at baseline and years 1 and 2 using DRSS were used for this analysis. The data source is DRCR.net, but analyses, content, and conclusions of this report are solely the responsibility of the authors.

Main outcome measures:

Proportion of eyes achieving at least a 4-step DRSS improvement (DR ultra-response) at years 1 and 2; treatment course for eyes achieving ultra-response; mean change in best-corrected visual acuity (BCVA) in eyes with and without ultra-response; factors associated with ultra-response (identified by univariate and multivariable analyses).

Results:

Approximately 30% of ranibizumab-treated eyes achieved DR ultra-response at year 1 (43/148; 29.1%) and year 2 (38/136; 27.9%); 74% of eyes with ultra-response at year 1 maintained their response at year 2. At year 2, patients with DR ultra-response had gained more than 5 additional ETDRS letters compared with those without DR ultra-response. Multivariable analyses identified presence of vitreous hemorrhage at baseline, increasing age, absence of epiretinal membrane, and glycated hemoglobin below 9 as predictive of DR ultra-response. Mean number of injections received was similar for eyes with versus without DR ultra-response to ranibizumab (mean, 7.4 vs. 7.6 in year 1; mean, 4.2 vs. 3.9 in year 2).

Conclusions:

Approximately 30% of eyes with a DRSS score of at least 47 receiving ranibizumab 0.5 mg per study protocol experienced at least a 4-step DR severity improvement on the DRSS, accompanied by meaningful improvements in BCVA.

Keywords:

Diabetic Retinopathy; Diabetic Retinopathy Severity Scale; Protocol S; Ranibizumab.

Analysis of Predisposing Clinical Features for Worsening Traction after Treatment of Familial Exudative Vitreoretinopathy in Children

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Abstract

Purpose:

To determine the incidence of worsening vitreoretinal traction after laser treatment for familial exudative vitreoretinopathy (FEVR) and to determine whether any baseline clinical features are associated with worsening.

Design:

Retrospective cohort comparison study in a university tertiary referral center.

Methods:

All patients 0-21 years of age treated with laser from January 1, 2001, to June 1, 2018, were studied. Worsening traction after treatment was defined as the occurrence within 6 months of worsening or development of tractional retinal detachment, folds, dragging, breaks, rhegmatogenous detachment, or worsening tractional membranes. Comparisons of baseline features between groups with and without worsening were performed to determine features associated with higher risk.

Results:

A total of 46 eyes from 28 patients met inclusion criteria. Of the 46 eyes, 6 (13%) had worsening after treatment. There were no significant differences in age or other baseline demographics between the cohorts with and those without worsening traction. The presence of proliferative tissue in contact with the lens was found in 2 of 6 patients with worsening compared to 1 of 40 (3%) without worsening (P = .04). Mean follow-up was 57.8 months (range, 6.6-134 months). At the 6-month follow-up, median logMAR visual acuity in the cohorts with and without worsening was 1.7 (Snellen 20/1002; n = 5) and 0.24 (Snellen 20/35; n = 16), respectively.

Conclusions:

Laser treatment resulted in worsening traction in a substantial proportion of eyes with FEVR. Children with proliferative tissue in contact with the lens may be at higher risk of worsening after laser. Potential measures to reduce risk will require further study to establish efficacy.

Localized versus 360° intraoperative laser retinopexy in cases of rhegmatogenous retinal detachment with mild-to-moderate grade proliferative vitreoretinopathy

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Abstract

Background/objectives:

To compare the efficacy of intraoperative localized and 360° laser retinopexy in cases of rhegmatogenous retinal detachment (RRD) treated with pars plana vitrectomy and air tamponade.

Subjects/methods:

In this interventional, prospective, randomized, comparative study, 93 consecutive cases of RRD were enroled. After randomization 48 eyes received circumferential, while 45 underwent localized intraoperative laser retinopexy. Number and position of the retinal breaks, presence of proliferative vitreoretinopathy and/or lattice degeneration were recorded. Anatomical and visual outcome of the two groups were compared at 6 months postoperatively.

Results:

Baseline characteristics did not significantly differ between groups. The single-operation reattachment rate was 86.66% in localized group and 89.58% in 360° group. The difference was not significant. ($P = 0.46$, χ^2 test). At 6 months postoperatively, visual acuity (logMAR) was 0.06 ± 0.05 in localized group and 0.05 ± 0.03 in 360° group. The difference was not statistically significant ($P = 0.673$, t-test).

Conclusions:

Localized laser resulted to be as effective as 360° laser application; this may lead some advantages in term of lower invasiveness, reduction risk of complications and time saving.

March 2021 segment compiled by: Dr. Chitaranjan Mishra, Aravind Eye Hospital Madurai