Retina Roundup

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1) Int J Retina Vitreous. 2023 Jun 18;9(1):36

Evaluation of visual acuity in dry AMD patients after micro current electrical stimulation

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Background: To assess micro current to improve vision for dry age-related macular degeneration. Dry age-related macular degeneration is a major cause of blindness, disability, and severe erosion of quality of life, throughout the world. Beyond nutritional supplementation, there is no approved therapy.

Methods: This was a prospective randomized sham controlled clinical trial for participants with confirmed dry AMD with documented visual loss. Participants were randomized three to one, to receive transpalpebral external micro current electrical stimulation with the MacuMira device. The Treatment group received four treatments in the first two weeks, and two further treatments at weeks 14 and 26. Differences in BCVA and contrast sensitivity (CS) were estimated with mixed-effects repeated measures analysis of variance.

Results: Change of visual acuity with ETDRS assessment of number of letters read (NLR) and contrast sensitivity at week 4 and 30, compared to the first visit, between 43 treatment and 19 sham control participants. The Sham Control group had NLR of 24.2 (SD 7.1) at baseline, 24.2 (SD 7.2) at 4 weeks, and 22.1 (SD7.4) at 30 weeks. The Treatment group had NLR of 19.6 (SD 8.9) at baseline, 27.6 (SD 9.1) at 4 weeks, and 27.8 (SD 8.4) at 30 weeks. The change in NLR from baseline in the Treatment compared to the Sham control group was 7.7 (95% CI 5.7, 9.7, $p < 0.001$) at 4 weeks and 10.4 (95% CI 7.8, 13.1, $p < 0.001$) at 30 weeks. There were similar benefits in CS.

Conclusion: This pilot study of transpalpebral microcurrent demonstrated improved visual measures and is very encouraging as a potential treatment for dry AMD.

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Trial registration: NCT02540148, ClinicalTrials.gov.

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Outcomes of switching from proactive to reactive treatment after developing advanced central neovascular age-related macular degeneration

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Purpose: We assessed outcomes of eyes with neovascular age-related macular degeneration (nAMD) that switched from proactive (treat-and-extend) to reactive (pro re nata) treatment regimen after developing macular atrophy (MA) or submacular fibrosis (SMFi).

Methods: Data were collected from a retrospective analysis of a prospectively designed, multinational registry of "real-world" nAMD treatment outcomes. Eyes without MA or SMFi when starting treatment with a vascular endothelial growth factor inhibitor regimen that subsequently developed MA or SMFi were included.

Results: Macular atrophy developed in 821 eyes and SMFi in 1,166 eyes. Seven percent of eyes that developed MA and 9% of those that developed SMFi were switched to reactive treatment. Vision was stable at 12 months for all eyes with MA and inactive SMFi. Active SMFi eyes that switched to reactive treatment had significant vision loss. No eyes that continued proactive treatment developed ≥15 letter loss, but 8% of all eyes that switched to a reactive regimen and 15% of active SMFi eyes did.

Conclusions: Eyes that switch from proactive to reactive treatment after developing MA and inactive SMFi can have stable visual outcomes. Physicians should be aware of the risk of a significant loss of vision in eyes with active SMFi that switch to reactive treatment.

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Shovel and Cut Technique: Bevelled Vitrectomy Probes to Address Diabetic Tractional Retinal Detachments

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Purpose: To describe a surgical technique using the structural advantages of bevelled tip cutters.

Methods: The introduction of beveled tips has been one of the few modifications that have been performed to vitrectomy probes since first described by Machemer in 1972. Shovel and cut technique uses this incredible modification to access tighter planes and remove broad diabetic membranes.

Description of Technique:
The shovel and cut technique can be used with any gauge probe to which the bevel tip is applied. The beveled tip of the cutter is used in a shovel manner to create a tissue plane between the diabetic plaque and the retina. As the beveled tip of the cutter moves parallel to the underlying retina, scar tissue naturally feeds into the cutting port where it is cut and aspirated with low flow rates.

Conclusion:
Shovel and cut technique takes advantage of beveled tip technological innovation to allow easy access and tissue dissection of the most difficult plaques in diabetic membranes. This technique allows us to remove these plaques in a safer, more controlled manner than previous described techniques.

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OCT biomarkers as predictors of visual improvement in diabetic macular edema eyes receiving dexamethasone implants

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Background: Several optical coherence tomography (OCT) biomarkers have been proposed as predictors for functional and anatomical outcomes in Diabetic Macular Edema (DME). This study aims to examine the impact of these OCT features on the visual acuity improvement of patients with DME after long-acting Dexamethasone intravitreal implants (DEX-I) injection. Furthermore, the safety and impact of DEX-I on clinical parameters, including intraocular pressure (IOP) were assessed

Methods: In this retrospective observational study, we reviewed the medical records of naïve and non-naïve eyes with DME who received at least one DEX-I. The primary endpoint was visual acuity improvement of ≥ 5 ETDRS letters at 1 month and 4 months after treatment. Secondary outcomes were the changes in OCT biomarkers and the impact of DEX-I on IOP at 1 and 4 months of follow-up. Linear panel regression analysis was used to test for differences in central subfield thickness (CST) over time and it was stratified according to biomarkers at baseline. Finally, a logistic regression analysis was used to identify factors predicting visual improvement at 1 and 4 months.

Results: We included 33 eyes of which 63.6% were at an advanced stage of DME. Overall, CST, cube average thickness (CAT), cube volume (CV), and intraretinal cystoid spaces > 200 µm (ICS) decreased following DEX-I injection ($p < 0.001$). Additionally, a thicker CST at baseline was observed in eyes with better visual improvement at one month ($p = 0.048$). After logistic regression analysis, CST was retained as the only predictor for visual improvement at one month ($p = 0.044$). Furthermore, panel regression analysis identified a relation between subfoveal neuroretinal detachment (SND) at baseline and CST increase at four months. Lastly, only 15.2% of the eyes necessitated topical medication for IOP reduction, with no differences observed when stratifying between naïve and non-naïve eyes.

Conclusion: Our analyses suggest that a ticker baseline CST may serve as a positive predictor of early visual improvement and SND presence at baseline may be a negative prognostic factor for CST increase 4 months after DEX-I injection. Other well-known biomarkers, such as disorganization of the inner retinal layers (DRIL) and hyperreflective foci (HF), did not demonstrate prognostic value on visual

outcomes, at least within the first four months following the injection.

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Investigating the factors affecting myopia in retinopathy of prematurity after laser treatment

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Background: We investigated the effect of the number of laser shots applied on the myopic variables to elucidate the mechanism of myopia development in laser-treated retinopathy of prematurity (ROP) eyes.

Methods: A total of 33 eyes of 17 infants with ROP who underwent laser treatment were included in the analysis. Cycloplegic retinoscopic refraction testing was carried out and the spherical equivalent (SE) was calculated. Relationships between SE and various variables (including the number of laser shots applied) were examined. In addition, an age-matched control group without ROP was prepared and ocular structural parameters were compared.

Results: Although there was no statistical difference in axial length (AL) between two groups ($p = 0.88$), SE was significantly more myopic in the ROP group ($p < 0.001$). SE was associated with AL, corneal refraction (CR), and crystalline lens power (CLP) in the ROP group. Of these three factors (AL, CR, and CLP), CLP and the number of laser shots applied were significantly correlated ($p = 0.003$); however, no correlations were observed between the number of laser shots and AL or CR ($p = 0.15$ and 0.10, respectively). Very similar tendency was observed in the analysis of the difference between right and left eyes in each child).

Conclusion: In laser-treated ROP eyes, AL, CR, and CLP were related to the degree of myopia. Moreover, the number of shots applied also affected the myopic status in laser-treated ROP eyes. Among AL, CR, and CLP, only CLP was correlated with the laser shots applied.

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RECURRENT FLOATERS AFTER LIMITED VITRECTOMY FOR VISION DEGRADING MYODESOPSIA

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Purpose: Limited vitrectomy improves vision degrading myodesopsia, but the incidence of recurrent floaters postoperatively is not known. We studied patients with recurrent central floaters using ultrasonography and contrast sensitivity (CS) testing to characterize this subgroup and identify the clinical profile of patients at risk of recurrent floaters.

Methods: A total of 286 eyes (203 patients, 60.6 ± 12.9 years) undergoing limited vitrectomy for vision degrading myodesopsia were studied retrospectively. Sutureless 25G vitrectomy was performed without intentional surgical posterior vitreous detachment (PVD) induction. CS (Freiburg Acuity Contrast test: Weber index, %W) and vitreous echodensity (quantitative ultrasonography) were assessed prospectively.

Results: No eyes (0/179) with preoperative PVD experienced new floaters. Recurrent central floaters occurred in 14/99 eyes (14.1%) without complete preoperative PVD (mean follow-up = 39 months vs. 31 months in 85 eyes without recurrent floaters). Ultrasonography identified new-onset PVD in all 14 (100%) recurrent cases. Young (younger than 52 years; 71.4%), myopic (≥-3D; 85.7%), phakic (100%) men (92.9%) predominated. Reoperation was elected by 11 patients, who had partial PVD preoperatively in 5/11 (45.5%). At study entry, CS was degraded (3.55 ± 1.79 %W) but improved postoperatively by 45.6% (1.93 ± 0.86 %W, P = 0.033), while vitreous echodensity reduced by 86.6% (P = 0.016). New-onset PVD postoperatively degraded CS anew, by 49.4% (3.28 ± 0.96 %W; P = 0.009) in patients electing reoperation. Repeat vitrectomy normalized CS to 2.00 ± 0.74%W (P = 0.018).

Conclusion: Recurrent floaters after limited vitrectomy for vision degrading myodesopsia are caused by new-onset PVD, with younger age, male sex, myopia, and phakic status as risk factors. Inducing surgical PVD at the primary operation should be considered in these select patients to mitigate recurrent floaters.

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