Retina Roundup

August 2024

1. Retina 2024 Jan 1;44(1):144-150. doi: 10.1097/IAE.0000000000003923.

Inverted Internal Limiting Membrane Flap Coverage With Autologous Blood Technique After Air–Fluid Exchange and Silicone Oil Tamponade for Extensive Macular Hole Retinal Detachment in Highly Myopic Eyes

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Purpose:
To report a technique consisting of inverted internal limiting membrane (ILM) flap coverage with autologous blood after air–fluid exchange and silicone oil tamponade in treating extensive retinal detachment secondary to a myopic macular hole (MH).

Methods:
This was a retrospective case series. 18 eyes with MHRD extending beyond the equator were included in this study with a minimum follow-up of 6 months. The procedures for pars plan vitrectomy (PPV) included the following: 1) The ILM was peeled to the superior and inferior arcade margins and, except for the ILM in the temporal region, was hinged toward the edge of the MH. 2) Air–fluid exchange was then performed to drain the subretinal fluid through the MH with a flute needle, ensuring that a small amount of subretinal fluid remained to facilitate ILM flap inversion. 3) The ILM flap was used to cover the MH with the assistance of autologous blood.

Results:
Six months after surgery, the MH was successfully anatomically closed, and retinal reattachment was observed in all 18 eyes of 18 patients. The mean best-corrected visual acuity logarithm of the minimum angle of resolution (logMAR) improved from 2.03 ±0.61 (ranging from hand motion [2.6] to finger counting [2.3]) to 1.23 ±0.63 (ranging from hand motion [2.6] to 20/28 [0.15]) ($P < 0.01$) at 6 months.

Conclusion:
This surgical technique using an inverted ILM flap combined with autologous blood provides an option for the treatment of extensive MHRD.

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2. Retina ():10.1097/IAE.0000000000004198, July 03, 2024. | DOI: 10.1097/IAE.0000000000004198

Fluid aspiration from intraretinal cysts for refractory diabetic macular edema

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Purpose
To report the surgical outcome of fluid aspiration in intraretinal cysts as a novel treatment approach for the refractory cystoid macular edema (CME) associated with diabetic retinopathy.

Methods:
This retrospective consecutive case series examined eight patients with refractory CME who underwent intraretinal cyst fluid aspiration using a 38-gauge subretinal infusion needle during pars plana vitrectomy. We reviewed changes in central retinal thickness (CRT), best-corrected visual acuity (BCVA), and central sensitivity among patients followed up for 12 months post-surgery.

Results:
CRT on optical coherence tomography (μm) significantly improved at 12 months post-surgery (308 ±99) compared to before surgery (480 ±141) ($P < 0.005$). During the follow-up period, CME relapsed in one eye. The BCVA (logarithm of the minimal angle of resolution) at 12 months post-surgery (0.23 ±0.32, Snellen equivalent: 20/50) was significantly better than the preoperative BCVA (0.39 ±0.29, Snellen equivalent: 20/63) ($P < 0.01$). The mean deviation value of central sensitivity did not significantly change between preoperative (-2.5 ±2.1) and postoperative (-2.2 ±2.2) assessments ($P = 0.07$).

Conclusions:
Fluid aspiration in intraretinal cysts may be a treatment option for refractory CME in eyes with diabetes.

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3. Invest Ophthalmol Vis Sci. 2024 Jul 1;65(8):5. doi: 10.1167/iovs.65.8.5

Differential Expression of Sex-Steroid Receptors in the Choroid Aligns With Central Serous Chorioretinopathy Sex Prevalence Across Different Ages

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Purpose: The purpose of this study was to investigate the presence of sex-steroid receptors in human choroidal tissue across different ages and sex, aiming to better understand the pronounced sex difference in central serous chorioretinopathy (CSC) occurrence.

Methods: Paraffin-embedded enucleated eyes of 14 premenopausal women, 15 postmenopausal women, 10 young men (<45 years), and 10 older men (>60 years) were used. A clinically certified immunostaining was performed to detect the presence of the androgen receptor (AR), progesterone receptor (PR; isoform A and B), and estrogen receptor (ERα). The stained slides were scored in a blinded manner for positive endothelial cells and stromal cells in consecutive sections of the same choroidal region.

Results: Our analysis revealed the presence of AR, PR, and ERα in endothelial cells and stromal cells of choroidal tissue. The mean proportion of AR-positive endothelial cells was higher in young men (46% ±0.15) compared to aged-matched women (29% ±0.12; $P < 0.05$, 95% confidence interval [CI]). Premenopausal women showed markedly lower mean proportion of ERα (5% ±0.02) and PR-positive endothelial cells (2% ±0.01) compared to postmenopausal women (15% ±0.07 and 19% ±0.13; both $P < 0.05$, 95% CI), young men (13% ±0.04 and 21% ±0.10; both $P < 0.05$, 95% CI), and older men (18% ±0.09 and 27% ±0.14; both $P < 0.05$, 95% CI). Mean PR-positive stromal cells were also less present in premenopausal women (12% ±0.07) than in other groups.

Conclusions: The number of sex-steroid receptors in the choroidal tissue differs between men and women across different ages, which aligns with the prevalence patterns of CSC in men and postmenopausal women.

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4. Front Neurosci. 2024 Jul 1;18:1415575.

Age-related macular degeneration: suitability of optogenetic therapy for geographic atrophy

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Abstract

Age-related macular degeneration (AMD) is a growing public health concern given the aging population and it is the leading cause of blindness in developed countries, affecting individuals over the age of 55 years. AMD affects the retinal pigment epithelium (RPE) and Bruch's membrane in the macula, leading to secondary photoreceptor degeneration and eventual loss of central vision. Late AMD is divided into two forms: neovascular AMD and geographic atrophy (GA). GA accounts for around 60% of late AMD and has been the most challenging subtype to treat. Recent advances include approval of new intravitreally administered therapeutics, pegcetacoplan (Syfovre) and avacincaptad pegol (Iveric Bio), which target complement factors C3 and C5, respectively, which slow down the rate of enlargement of the area of atrophy. However, there is currently no treatment to reverse the central vision loss associated with GA. Optogenetics may provide a strategy for rescuing visual function in GA by imparting light-sensitivity to the surviving inner retina (i.e., retinal ganglion cells or bipolar cells). It takes advantage of residual inner retinal architecture to transmit visual stimuli along the visual pathway, while a wide range of photosensitive proteins are available for consideration. Herein, we review the anatomical changes in GA, discuss the suitability of optogenetic therapeutic sensors in different target cells in pre-clinical models, and consider the advantages and disadvantages of different routes of administration of therapeutic vectors.

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5. Clin Invest. 2024 Jul 16:e174199.

DRD2 activation inhibits choroidal neovascularization in patients with Parkinson's disease and age-related macular degeneration DRD2 activation inhibits choroidal neovascularization in patients with Parkinson's disease and age-related macular degeneration

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Abstract

Age-related macular degeneration (AMD) is one of the main causes of visual acuity (VA) loss in people over 50 years of age worldwide, with neovascular AMD (nAMD) accounting for 80% of cases of severe vision loss due to this disease. Anti-vascular endothelial growth factor (anti-VEGF) drugs have been used for the treatment of this disease for more than a decade, changing drastically the visual prognosis of these patients. However, initial studies reporting data on outcomes were short term. Currently, there are different series published on the long-term results of AMD after treatment with anti-VEGF, and the aim of this review is to synthesize these results. The mean follow-up of the included studies was 8.2 years (range 5-12 years). The mean initial VA was 55.3 letters in the Early Treatment Diabetic Retinopathy Study (ETDRS) (range 45.6-65) and the mean final VA was 50.1 letters (range 33.0-64.3), with a mean loss of 5.2 letters. At the end of follow-up, 29.4% of the patients maintained a VA > 70 letters. The 67.9% of patients remained stable at the end of follow-up (< 15 letter loss), with a severe loss (≥ 15 letters) of 30.1%. Fibrosis and atrophy were the main causes of long-term VA loss, occurring at the end of follow-up in 52.5% and 60.5%, respectively.

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PMID: 39012703.

6. Ophthalmology. 2024 Jul 1:S0161-6420(24)00392-0.

Retinal Tear and Retinal Detachment Following Cataract Surgery in Eyes with a Previous History of Treated Phakic Retinal Tears-related macular degeneration DRD2 activation inhibits choroidal neovascularization in patients with Parkinson's disease and age-related macular degeneration

Momenaei B, Zhou A, Kazan AS, Wakabayashi T, Obeid A, Morano M, Khan MA, Xu D, Kuriyan AE, Yonekawa Y, Hsu J, Ho AC. Retinal Tear and Retinal Detachment Following Cataract Surgery in Eyes with a Previous History of Treated Phakic Retinal Tears.

Abstract

Objective: To investigate the incidence and outcomes of retinal tear (RT) and retinal detachment (RD) after cataract extraction in patients with a history of previous phakic RT.

Design: Retrospective case series.

Subjects: Phakic eyes with RT that were successfully treated with laser photocoagulation or cryotherapy and subsequently underwent cataract surgery.

Method: A retrospective review of phakic eyes treated for RTs between April 1, 2012 and May 31, 2023 was performed. Exclusions included prior vitreoretinal surgery before cataract removal and follow-up of less than 6 months post-cataract surgery.

Main outcome measures: The incidence of RTs and RDs after cataract surgery, along with visual and anatomic outcomes.

Results: Of 12,109 phakic eyes treated for RTs, 1039 (8.6%) eyes underwent cataract surgery. After exclusions, 713 eyes of 660 patients were studied. The mean (standard deviation, SD) follow-up period post-cataract surgery was 34.8 (24.6) months with a median of 239 and 246 days to a new RT or RD development. The overall incidence for diagnosis of post-cataract surgery RT and RD was 7.3% (52/713) (2.9% and 4.3%, respectively), with a one-year incidence of 5.6% (2.2% and 3.4%, respectively). Multivariable regression analysis identified a higher risk of RT/RD among younger individuals (odds ratio [OR] 1.034; 95% confidence interval [CI] 1.004-1.065, P=0.028), males (OR 2.058; 95% CI 1.110-3.816, P=0.022), and those with shorter interval between laser treatment and cataract surgery (OR 1.001; 95% CI 1.001-1.001, P=0.011). Single surgery anatomic success for the RD repair was achieved in 25 eyes (80.6%) at 3 months, with a 100% final reattachment rate. The median final logMAR visual acuity was 0.10 (20/25) for RT, showing no significant change from post-cataract surgery, and 0.18 (20/30) for RD, a significant worsening from after cataract surgery.

Conclusion: One year post-cataract surgery, the rate of diagnosed RT and RD in patients with previously treated RTs was relatively high, occurring in nearly 1 in 18 eyes. Higher risk was noted among younger individuals, males, and patients with a shorter interval between initial treatment for RT and cataract surgery. RD repair achieved good anatomical results, but vision declined.

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