RETINA ROUNDUP

June 2024

1. **Int J Retin Vitr 10, 32 (2024). https://doi.org/10.1186/s40942-024-00553-5**

Evaluating photodynamic therapy versus brolucizumab as a second-line treatment for polypoidal choroidal vasculopathy

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Background:
To compare the one-year outcomes between intravitreal brolucizumab (IVBr) monotherapy and photodynamic therapy (PDT) as a second-line treatment in patients with polypoidal choroidal vasculopathy (PCV) who did not respond to first-line therapy.

Methods:
This case–control study included eyes with PCV that do not respond to aflibercept or ranibizumab. The patients were retrospectively registered. We compared outcomes, including best-corrected visual acuity (BCVA), anatomical results, and the need for additional treatments, between IVBr and a combination therapy using PDT as second-line treatments for refractory PCV, after adjusting for potential confounders. We analyzed E-values to evaluate the robustness of the results against unmeasured confounders.

Results:
Twenty-two eyes received IVBr, and twenty-four underwent PDT. No apparent differences were observed in BCVA and central macular thickness (CMT) changes from baseline between the groups (IVBr vs. PDT: BCVA, 0.01±0.47 logMAR vs. 0.04±0.18 logMAR, P-value=0.756; CMT: − 36.3±99.4 µm vs. − 114.7±181.4 µm, P-value=0.146). Only in the PDT group, five eyes (20.8%) did not require additional treatment after the second-line treatment, the adjusted odds ratio indicating no further treatment needed was 11.98 (95% confidence interval: 1.42–2070.07, P-value=0.019). The E-value for the adjusted odds ratio was 23.44.

Conclusions:
Both second-line treatments for PCV exhibited similar visual and anatomical outcomes. Only in the PDT treated eyes were there some patients who did not require further treatment after second-line therapy.

- PMID: 38589964
- DOI: 10.1186/s40942-024-00553-5

2. **Retina 44(5):p 774-781, May 2024. | DOI: 10.1097/IAE.0000000000004046**

THE ROLE OF INTRAVITREAL METHOTREXATE AS AN ADJUNCT TO LOCAL OR SYSTEMIC CORTICOSTEROIDS IN VITRECTOMY FOR RHEGMATOGENOUS RETINAL DETACHMENT AND CHOROIDAL DETACHMENT

A Pilot Study

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Purpose:
To evaluate the role of repeated intravitreal methotrexate as an adjunct to pars plana vitrectomy in the management of rhegmatogenous retinal detachment with choroidal detachment.

Method:
The authors compared anatomical and visual outcomes of rhegmatogenous retinal detachment with choroidal detachment eyes that underwent pars plana vitrectomy with (Group B) or without repeated intravitreal methotrexate (Group A).

Results:
The study included 25 eyes of 25 patients, 16 eyes in Group A and nine in Group B. Both groups had similar baseline characteristics. In Group A, successful retinal attachment was achieved in 50% as compared with 89% in Group B; however, the difference was not statistically significant (P = 0.08). Also, Group B had a significantly greater change in visual acuity from baseline to the last follow-up visit (1.6 + 1.5 logMAR units) compared with Group A (1.18 + 1 logMAR units) (P = 0.05). There were no significant safety concerns with the use of intravitreal methotrexate.

Conclusion:
Repeated intravitreal methotrexate after vitrectomy for rhegmatogenous retinal detachment with choroidal detachment improves outcomes without posing major safety concerns. Nonetheless, further investigation is necessary to establish the optimal intravitreal methotrexate dosage and duration to prevent recurrence effectively.

- PMID: 38194672
- DOI: 10.1097/IAE.0000000000004046

3. **Retina 44(3):p 392-399, March 2024. | DOI10.1097/IAE.0000000000003988**

FULL-THICKNESS MACULAR HOLE CLOSURE WITH TOPICAL MEDICAL THERAPY

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Purpose:
To examine the efficacy and clinical characteristics of successful full-thickness macular hole closure with topical therapy.

Methods:
Retrospective case series of full-thickness macular holes managed by a single retinal physician (DS) diagnosed and treated from 2017 to 22.

Results:
Of 168 patients with full-thickness macular holes, 71 patients were started on steroid, carbonic anhydrase inhibitor, and nonsteroidal anti-inflammatory (NSAID) drops. 49 patients (mean 67 years, 59% women) were included in the analysis, and 22 patients were excluded for poor follow-up. In total, 7/49 were secondary post-PPV holes and 42/49 were idiopathic. In addition, 18/49 eyes (36.7%) achieved closure on topical therapy, of which 13 were idiopathic. Hole size was directly correlated with odds of closure: for every 10 μm decrease in size and odds of closure increased by 1.2× (P = 0.001, CI 1.1–1.4). Average time to closure was 107.2 days (range 20–512 days) and was not correlated with hole size (P = 0.217, CI −0.478 to +1.938). The presence of VMT was found to be inversely related to successful closure (OR 6.1, P = 0.029, CI 1.2–31.3). There was no significant difference in final best-corrected visual acuity for eyes undergoing primary pars plana vitrectomy versus those on drops before undergoing pars plana vitrectomy (P = 0.318, CI −0.094 to +0.112).

Conclusion:
In the first study to date to report the overall efficacy and clinical characteristics of successful macular hole closure with topical therapy, drops achieved an overall closure rate of 36.7%, with higher efficacy in smaller holes and those without VMT. Rates of MH narrowing and reduction in central foveal thickness acted as predictors of effectiveness of drop therapy.

- PMID: 37948745
- DOI: 10.1097/IAE.0000000000003988

4. **Retina. 2024 Jan 1;44(1):175-178. doi: 10.1097/IAE.0000000000003985.**

Modification of the Suprachoroidal Buckling Technique for the Treatment of Rhegmatogenous Retinal Detachment

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Purpose:
To describe modification of the suprachoroidal buckling technique for the treatment of rhegmatogenous retinal detachment (RRD), which may improve the safety profile.

Methods:
A single-surgeon foot-pedal-controlled automated suprachoroidal injection (SCI) of sodium hyaluronate 1%, namely ProVisc (Alcon Laboratories, Fort Worth, TX) was used for the treatment of RRD. MicroDose Injection Kit (MedOne Surgical, Sarasota, FL) including a connector and a 1-mL syringe, designed for subretinal injection, was used to adapt Constellation Vision System (Alcon Laboratories) console for SCI of ProVisc from the 1-mL syringe.

Results:
This approach enables better surgeon control during SCI. Three highly myopic eyes of three patients with primary macula-on RRD and single superior peripheral retinal break were treated. Complete retinal reattachment was achieved in all eyes without complications.

Conclusion:
Injecting ProVisc under foot-pedal control provides a more precise and potentially safer suprachoroidal buckling technique compared with the manual technique with more variable injection speed and pressure.

- PMID: 37972987
- DOI: 10.1097/IAE.0000000000003985

5. **Ophthalmol Retina. 2024 Jan;8(1):18-24.doi: 10.1016/j.oret.2023.08.007. Epub 2023 Aug 21.**

Comparison of Endophthalmitis Rates after Alcohol-Based Chlorhexidine and Povidone-Iodine Antisepsis for Intravitreal Injections

Objective: Intravitreal injections (IVIs) are the most frequently performed intraocular procedure in Canada. Povidone-iodine (PI) is the current gold standard for antisepsis for IVI and is widely used; chlorhexidine (CH) is a possible alternative antiseptic agent. This study aims to compare rates of endophthalmitis after IVI with 0.05% chlorhexidine with a 4% alcohol base antisepsis to rates of endophthalmitis after IVI with 10% PI antisepsis.

Design: Retrospective cohort study.

Subjects: Eyes that received IVI between May 2019 and October 2022 at a group retina practice in Edmonton, Canada.

Methods: Eyes at a single centre received focal conjunctival application of either 10% PI antisepsis or 0.05% CH in 4% alcohol antisepsis for 30 seconds before each IVI.

Main Outcome Measure: Rates of endophthalmitis between the PI and CH groups.

Results: A total of 170 952 IVIs were performed during the study period. A total of 31 135 were performed using CH prophylaxis compared with 139 817 with PI prophylaxis. Among all IVIs there were 49 total cases of endophthalmitis, 29 in the PI group (0.021%) and 20 in the CH group (0.064%). There was a statistically significant difference in the rates of endophthalmitis between the 2 groups ($P < 0.001$). The odds ratio for developing endophthalmitis with CH antisepsis was 3.1 (95% confidence interval, 1.9e5.2) compared with PI antisepsis. There were increased odds of developing endophthalmitis with aflibercept injection compared with bevacizumab (odds ratio, 3.48; 95% confidence interval, 2.09e7.24).

Conclusions: There is a statistically significant difference in rates of endophthalmitis between alcohol-based CH and PI antisepsis for IVI in our patient population utilizing the methods discussed. In our center, alcohol-based CH is now considered a second-line antiseptic agent.

- PMID: 37611695
- DOI: 10.1016/j.oret.2023.08.007

6. Acta Ophthalmol. 2024 May 7. doi: 10.1111/aos.16705.Epub ahead of print.

Thyroid dysfunction and exudative age-related macular degeneration - A longitudinal nationwide registry-based cohort study

Purpose: The association between thyroid dysfunction and exudative age-related macular degeneration (AMD) is unknown.

Methods: In this Danish longitudinal nationwide registry-based cohort study we included all Danish residents aged 50-100 between 2008 and 2018. Using the Danish national registries, we studied the association between thyroid dysfunction and exudative AMD. Thyroid dysfunction was classified as two consecutive redeemed prescriptions of thyroid hormones (hypothyroidism) or anti-thyroid medication (hyperthyroidism). Exudative AMD was classified as an ICD diagnosis of AMD and a code for anti-VEGF treatment. All patients are treated for exudative AMD in a hospital in Denmark, and we therefore have complete registration of this patient group.

Results: We included 2 087 305 individuals, of which 1 072 567 (51.4%) were women; 59 318 (2.8%) had hypothyroidism, and 33 922 (1.6%) had hyperthyroidism. During a median follow-up of 11 years, 26 998 (1.3%) people developed exudative AMD. Hypothyroidism (adjusted hazard ratio [HR]: 1.17; 95% confidence interval [CI] 1.10-1.25; $p < 0.001$) and hyperthyroidism (HR: 1.23; 95% CI:1.13-1.34; $p < 0.001$) were both associated with the development of exudative AMD. The age-stratified analyses yielded similar results to the main analyses, except that the risks were exaggerated in the older part of the population.

Conclusion: This is the first longitudinal nationwide study showing that both hypo- and hyperthyroidism are associated with an increased risk of exudative AMD. AMD is a quantitative problem in the population and our findings could have a public health impact. Further studies are needed to study the underlying mechanisms of the association.

- PMID: 38712900
- DOI: 10.1111/aos.16705

7. **Int Ophthalmol. 2024 May 7;44(1):220. doi: 10.1007/s10792-024-03136-3.**

Comparison of the cytokines levels in aqueous humor in vitrectomized eyes versus non-vitrectomized eyes with diabetic macular edema

Background: This study was conducted to compare concentrations of VEGF family growth factors, inflammation-related factors, and adhesion molecules in the aqueous humor of eyes with diabetic macular edema (DME), with and without prior vitrectomy.

Methods: A total of 31 eyes were included, 11 with DME that had undergone vitrectomy, 9 with DME but without vitrectomy, and 11 from age-related cataract patients as controls. The concentrations of cytokines including TNF-α, IL-6, IL-8, IP-10, MCP-1, IFN-γ, MIP-1 α, MIP-1 β, PECAM-1, MIF, VCAM-1, ICAM-1, PIGF were quantified using Luminex Human Discovery Assay. Central macular thickness (CMT) values of all eyes were measured using optical coherence tomography (OCT).

Results: (1) Vitrectomized DME eyes exhibited significantly higher levels of IL-6 and IL-8 compared to non-vitrectomized eyes ($P < 0.05$). (2) In vitrectomized group, after Benjamini-Hochberg correction, there was a significant positive correlation between the levels of VEGF and PlGF ($r_s = 0.855$, $P < 0.05$), as well as the levels of TNF-α and IFN-γ ($r_s = 0.858$, $P < 0.05$). In non-vitrectomized group, significant positive correlations were found between VEGF and PlGF levels after correcting for multiple comparisons ($r_s = 0.9$, $P < 0.05$). (3) In non-vitrectomized group, the concentrations of VEGF and PlGF in aqueous humor were significantly positively correlated with CMT values ($r_s = 0.95$, $P < 0.05$; $r_s = 0.9$, $P < 0.05$, respectively).

Conclusions: The concentrations of IL-6 and IL-8 in the aqueous humor were significantly higher in vitrectomized DME eyes compared to non-vitrectomized DME eyes and the levels of VEGF were similar in the two groups, suggesting that inflammation after vitrectomy may be a key factor in the occurrence and development of DME.

- PMID: 38713261
- DOI: 10.1007/s10792-024-03136-3