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Surgical Techniques Symposium 2

Postoperative Day 0 as a Substitute for Postoperative Day 1 Examination Following Vitreoretinal Surgery: A Comparative Prospective Study



- Christina Weng, MD, MBA, FASRS
- Guadalupe Torres, MD
- D. Wilkin Parke, MD

Objective: Is day 0 a comparable substitute for a day 1 postoperative examination following vitreoretinal surgery?
Purpose: Most vitreoretinal (VR) surgeries are performed on an outpatient basis with the patient returning for a postoperative day (POD) 1 evaluation. A recent meta-analysis affirmed the importance of the POD1 examination, but the POD1 visit can occasionally pose logistic, travel, and caretaker constraints for the patient[1]. Recent retrospective studies assessing the incidence of complications on POD0, POD2, and POD3 following VR surgery show comparable rates of intervention to those on POD1[2-4]. The purpose of our prospective study was to evaluate the POD0 visit as a substitute for the POD1 visit by assessing differences in the intraocular pressure (IOP), best-corrected visual acuity (BCVA), postoperative complications, pain, and view of the retina.

[1]Bheemidi AR, Roan VD, Muste JC, Singh RP. *Ophthalmic Surg Lasers Imaging Retina*. 2021 Sep;52(9):513-8.
[2]Ringeisen AL, Parke DW 3rd. *Ophthalmic Surg Lasers Imaging Retina*. 2018 Sep 1;49(9):e52-6.
[3]Zick J, Joondeph BC. *Retina*. 2018 Feb;38(2):331-3.
[4]Ho VY, Shah GK. *Journal of VitreoRetinal Diseases*. 2017;1(2):126-132.

Methods: Patients & Methods
Non-randomized prospective study of 90 consecutive eyes (82 patients) from two VR surgeons (CYW and DWP III) at different surgical centers. All participants provided written consent and study was approved by the Institutional Review Boards at each institution. The study included eyes with a variety of vitreoretinal conditions, procedures, and tamponade agents. Eyes that presented for both a POD0 and POD1 visit and had complete metrics (age, sex, laterality of eye operated, surgical procedure components, IOP, BCVA, postoperative complications, pain, and view of retina) recorded were included; eyes unable to complete both a POD0 and POD1 visit or had missing data points were excluded.

POD0 and POD1 Exam
Following surgery, all patients received a POD0 exam at the end of the day along with a POD1 exam the following day. Subsequent follow-up was scheduled per routine practice. IOP was measured on POD0 (~7 hours postoperatively, range 4-10 hours) and POD1; three measurements taken with a tonometer were averaged. Hypotony (5 mmHg or less) and elevated IOP (25 mmHg or greater) were noted and drops initiated for IOP >/= 30 mmHg. BCVA was measured with Snellen chart and pinhole. Patients rated their pain on a scale of 0-2; retina specialists rated their view of the retina on a scale of 0-2. Any postoperative complications and treatment interventions were recorded.

Statistical Analysis
SPSS for Windows software was used for statistical analysis. Paired t-test was used to compare means of continuous variables. Chi-square test and Fisher exact test were used to compare nonpaired groups with categorical variables. McNemar test and Wilcoxon ranked sum test were used to compare paired proportions for dichotomous variables and ordinal variables, respectively. P-value of <.05 was considered statistically significant.
Results: Ninety eyes (82 patients) were included with average age of 56.5 years (SD 12.3, range 23-84); 48 eyes (53.3%) were from males. The most common primary indications for surgery were non-clearing vitreous hemorrhage, rhegmatogeous retinal detachment (RD), and tractional RD; 27 (30%) were combined cases where cataract surgery was also performed. Table 1 reports the frequency of VR surgical components performed. Mean surgery duration was 85.8 minutes (SD 45.6). Mean time elapsed from end of surgery to POD0 examination was 468.4 minutes (SD 184).

Mean BCVA improved from logMAR 2.04 (SD 0.44) on POD0 to logMAR 1.83 (SD 0.65) on POD1 (P<.001). Mean IOP increased from 13.8 mmHg (SD 7.5) on POD0 to 17.5 mmHg (SD 7.0) on POD1 (P<.001). On POD0, 16.1% of eyes had hypotony and 3.4% of eyes had IOP >/= 30 mmHg compared to 5.7% and 4.6% of eyes on POD1, respectively. Multiple regression analysis showed that the IOP change from POD0 to POD1 did not have a significant correlation with any of the explanatory variables tested such as type of tamponade, injection of silicone oil, or scleral buckle placement.

A larger proportion of eyes had hypotony on POD0 versus POD1 (16.1% vs. 5.7%, P=.012) while more eyes had elevated IOP on POD1 versus POD0 (17.2% vs. 6.9%, P=.004); only 3.4% and 4.6% of eyes had IOP >/= 30 mmHg requiring topical drops on POD0 and POD1, respectively. Nine eyes had an IOP < 25 mmHg on POD0 which increased to >/= 25 mmHg on POD1 (Table 2); concurent placement of an intraocular lens, C3F8 tamponade, or a TRD diagnosis were associated with delayed IOP elevation. There were no significant differences in pain levels, visualization of the retina, or other postoperative complications observed between the two postoperative days.
Conclusion: The proportion of eyes developing significant postoperative complications on POD1 after an examination on POD0 is low. While there was an increase in IOP between POD0 and POD1, the values for both days fell within normal range. Although a higher proportion of eyes with IOP >/= 25 mmHg was seen on POD1 versus POD0, the proportion with IOP >/= 30 mmHg requiring treatment was low. The BCVA improved from POD0 to POD1 which may partially be due to the retrobulbar block wearing off. The majority of eyes had no change in pain or view of retina between POD0 and POD1, and the number of eyes with increased and decreased pain or view of retina from POD0 to POD1 was similar. No cases of endophthalmitis were detected on either day, and other postoperative complications occurred at similarly low rates as expected for this timepoint in the postoperative course. Small sample size is a limitation of this study, but its results support that a POD0 examination is a safe and effective substitute for the traditional POD1 examination.

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Table 1. Components of Surgery Performed.

Surgery Component	**Count (%) (n =90)**
Pars Plana Vitrectomy	88 (97.8)
23-gauge	55 (61.1)
25-gauge	35 (38.9)
Endolaser	68 (75.6)
Air Fluid Exchange	59 (65.6)
Membrane Peel	43 (47.8)
Phacoemulsification	10 (11.1)
Pars Plana Lensectomy	7 (7.8)
Scleral Buckle	6 (6.7)
Retinectomy	3 (3.3)
Gas	
None	49 (54.4)
C_3F_8	21 (23.3)
Air	11 (12.2)
SF_6	9 (10.0)
Removal of Oil	12 (13.3)
Silicone Oil	
None	71 (78.9)
1000 cs	14 (15.6)
5000 cs	5 (5.6)

IOL Placement	14 (15.6)
IOL Reposition	2 (2.2)
IOL Removal	2 (2.2)
Number of Sclerotomy Sites Sutured	
0	21 (23.3)
1	4 (4.4)
2	0
3	65 (72.2)

Abbreviations: cs, centistoke; IOL, intraocular lens

Components of Surgery Performed

Table 2. Contingency Table for Eyes with IOP ≥ 25 mmHg

		POD1 IOP ≥ 25 mmHg		
		No	Yes	Total
POD0 IOP ≥ 25 mmHg	No	72	9	81
	Yes	0	6	6
Total		72	15	87

Abbreviations: IOP, intraocular pressure

Contingency Table for Eyes with IOP >/= 25 mmHg

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Dropless Vitrectomy with Suprachoroidal Triamcinolone-Moxifloxacin: A Comparative Analysis of Safety and Efficacy With Standard-of-Care Topical Drops

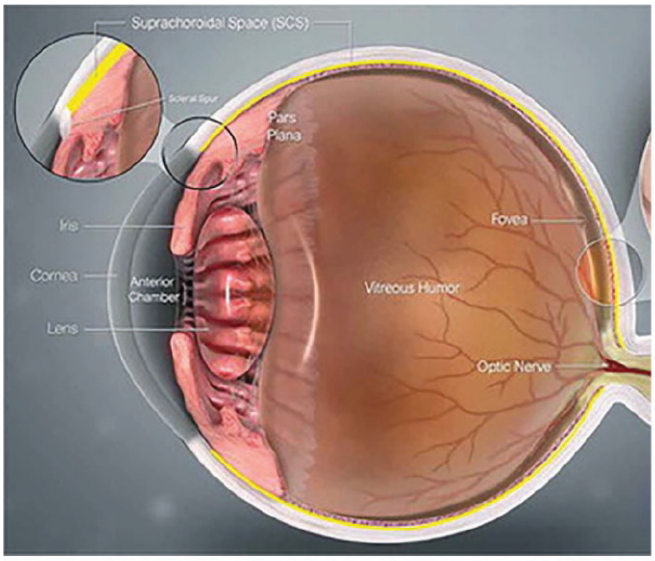


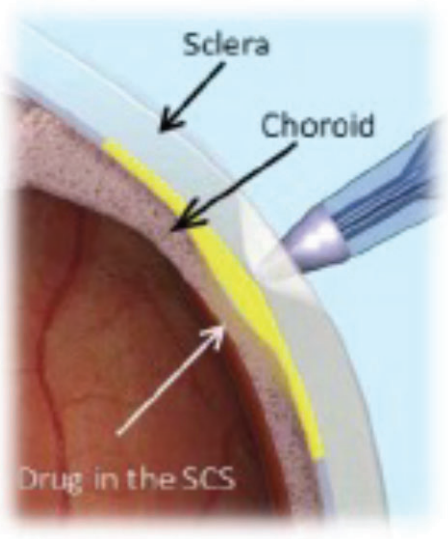
- K. Chalam, MD, PhD, MBA, FRCS(C), FASRS
- Marib Akanda, MD
- Shailesh Gupta, MD, MBA

Objective: Single **suprachoroidal** intraoperative (trimoxi) triamcinolone acetonide–moxifloxacin injection without postoperative drops effectively control inflammation after vitreous surgery (for variety of retinal disorders) and not inferior to standard drop therapy
Purpose: Successful outcomes and risk reduction in modern vitrectomy surgery depend, in part, on patient adherence to postoperative topical eye drop regimens. However, topical drops are costly and often difficult for patients to administer correctly. Nonadherence or poor compliance can result in significant consequences, including postoperative complications for the patient and antibiotic resistance at a societal level.

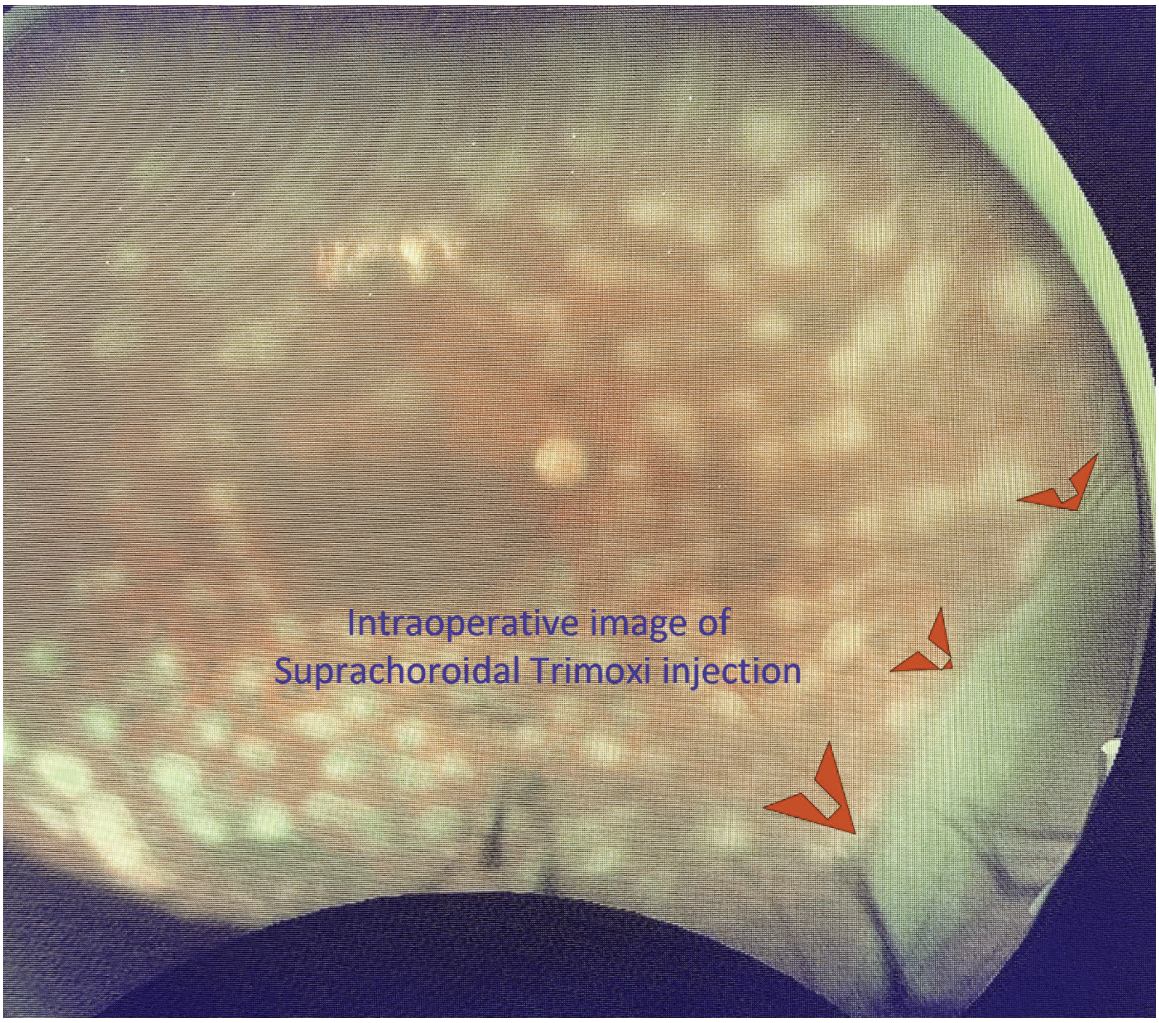
We compared the effectiveness of a single suprachoroidal injection of triamcinolone acetonide–moxifloxacin (Tri-Moxi) with a standard postoperative topical regimen in controlling inflammation, preventing infection, visual acuity, and the incidence of elevated intraocular pressure (IOP) following vitrectomy surgery.
Methods: In this retrospective longitudinal comparative study, electronic medical records of patients who underwent vitrectomy with a single suprachoroidal injection of 0.3 cc of triamcinolone acetonide–moxifloxacin with custom made 34 G 1 mm needle (Group 1) were reviewed and compared with those of patients who received a standard postoperative topical regimen of tapering doses of steroid-antibiotic eye drops (Group 2). Outcomes assessed included intraocular inflammation, corneal edema, visual acuity, incidence of postoperative infection and the incidence of elevated IOP at postoperative days 1, 42 (6 weeks), and 90 (3 months).
Results: The study included 122 eyes of 122 patients (61 eyes per group). At 6 weeks and 90 days postoperatively, anterior chamber cell reaction severity decreased by 22.0% and 24.0%, respectively, in the suprachoroidal injection group compared with the standard eye drop group ($P < .001$ and $P < .02$, respectively). Best-corrected distance visual acuity improved by approximately three lines in both groups at 90 days ($P < .001$). Corneal edema was significantly more severe in Group 2 on postoperative day 1 (odds ratio, 1.16; $P < .001$), though no statistically significant differences were observed at 6 weeks or 90 days ($P = .22$ and $P = .38$, respectively). The incidence of elevated IOP did not differ significantly between groups at any postoperative time point. No cases of endophthalmitis were reported.
Conclusion: Suprachoroidal triamcinolone acetonide–moxifloxacin injection (dropless vitrectomy) effectively controls intraocular inflammation following vitrectomy surgery and is noninferior to standard topical therapy. It represents a viable alternative, particularly for patients with poor adherence to postoperative eye drop regimens.

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Details of suprachoroidal space injection



Intraoperative fundus image of suprachoroidal trimoxi injection

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A Prospective Assessment of the ASRS Surgical Log as a Tool to Accurately Assess Fellow Role and Performance in Surgery



- Alexander Melamud, MD, MA
- Jeanette Du, MD
- jared ebert, MD
- sarah Kamal, MD
- abdullah Abou-Samra, MD
- Mohsin Ali, MD
- Josh Levinon, MD
- Brian Do, MD
- Mohammed Barazi, MD
- Kimberly Rivera Velez, BS
- rakhee Palekar, MD, MPH

Objective: To prospectively evaluate fellows' ability to accurately self-evaluate surgical role and performance using a surgical case log
Purpose: Self-assessment is widely used in vitreoretinal surgery training programs.The American Society of Retina Specialists (ASRS) supports an online surgical case log. Program directors can use this information to evaluate whether trainees are meeting standards of training. We set out to evaluate the validity of the ASRS log to accurately document role and performance of trainees in a 2-year vitreoretinal surgery fellowship program.

Methods: We conducted a prospective study comparing fellow and faculty evaluations of the fellow's role and performance during surgery. A questionnaire was designed to closely model the ASRS case log. Subjects were provided instructions for evaluating the fellow's role in each surgery as follows: primary (performed >75%), assistant (performed 25-74%), observer (performed <24%). The fellow's competence on each surgery was evaluated on a scale of 0-5 as follows; 0=N/A, 1= minimal competence, required assistance, 2= moderate competence but required assistance, 3= moderate competence but required no assistance, 4= highly competent, 5= highly competent with the ability to teach.
Four fellows and twenty-seven attendings, members of the Retina Group of Washington/Georgetown/Washington Hospital Center vitreoretinal surgery fellowship, took part as subjects. One attending and one fellow took part in each surgery. Subjects were asked to complete the survey at the end of each procedure without comparing answers. Data collection occurred between August and December and included the year of training, gender, facility type, surgery CPT code and date. The surgical facility was coded as "hospital" or "ambulatory."
Statistical analysis was performed using R studio. Role discrepancy analysis was conducted to examine differences in reporting the fellow's surgical role. Chi-square tests were used to analyze discrepancies across year of training, gender, facility type, procedure type and temporal distribution by month. To analyze competence, paired ratings were categorized as "Attending rated higher," "Fellow rated higher," or "Equal." The Wilcoxon Signed-Rank Test was used as the primary statistical test and a paired t-test was performed for confirmatory evidence.
Results: Data from 450 surgeries were analyzed. Most (~80%) surgeries were performed in the primary role in hospital settings (86.2%). One male and one female fellow were part of each fellowship class. Data showed an even distribution among cases by fellow gender (52.2% male, 47.8% female), with most cases performed by second-year fellows (73.1%). Macular surgery was the most common procedure type (23.6%), and the highest case volume occurred during September-October.
Attendings and fellows disagreed in assessment of role in 10.5% of cases. There was a higher proportion of disagreement among attendings and first year fellows (25.2%) than attendings and second-year fellows (4.8%) and this difference was significant ($p < 0.001$). Gender differences were not significant ($p = 0.07$), with male fellows showing 13.2% discrepancy compared to female fellows at 7.4%. Clinical settings showed low discrepancy rates (hospital 10.3%, ambulatory 11.3%) with no significant difference ($p = 0.996$). Analysis by month suggested improvement over time, with August showing the highest discrepancy rate and better agreement in later months.
In the analysis of competence, attendings gave higher ratings to fellows than fellows gave themselves in about 78% of cases. Fellows rated themselves higher than attendings only in about 4% of cases and ratings were equal 18% of the time. This pattern was statistically significant ($p < 0.001$) and held across all subgroups analyzed. The average difference between attending and fellow ratings was also calculated, showing that attendings rated fellows almost one full point higher on a 5-point scale than fellows rated themselves (mean difference = 0.99 points).

Conclusion: In our prospective analysis we found that trainees agreed with faculty in evaluating their role in the surgery most of the time. When disagreement occurred, it was more likely to be found in the first year of training and more likely to be an underestimation rather than overestimation. Gender, case type and surgical setting did not affect evaluation of role. The accuracy of self-assessment trended towards improvement as the academic year progressed. On performance, fellows consistently graded themselves lower regardless of their year of training, gender, facility type or the surgical procedure. In summary, fellows improve in assessing their surgical role as they progress through training but consistently underestimate their performance throughout their fellowship. Better communication early in training and consistent feedback throughout training may result in more correct surgical log documentation.

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Combined Vitrectomy and Reduced-Dose Transscleral Diode Laser Cyclopexy for Managing Large Cyclodialysis Clefts: A Vitreoretinal Approach



- Mauricio Bayram-Suverza, MD
- Geovanni Rios, MD
- Angel Garcia, MD
- Abel Ramírez-Estudillo, MD

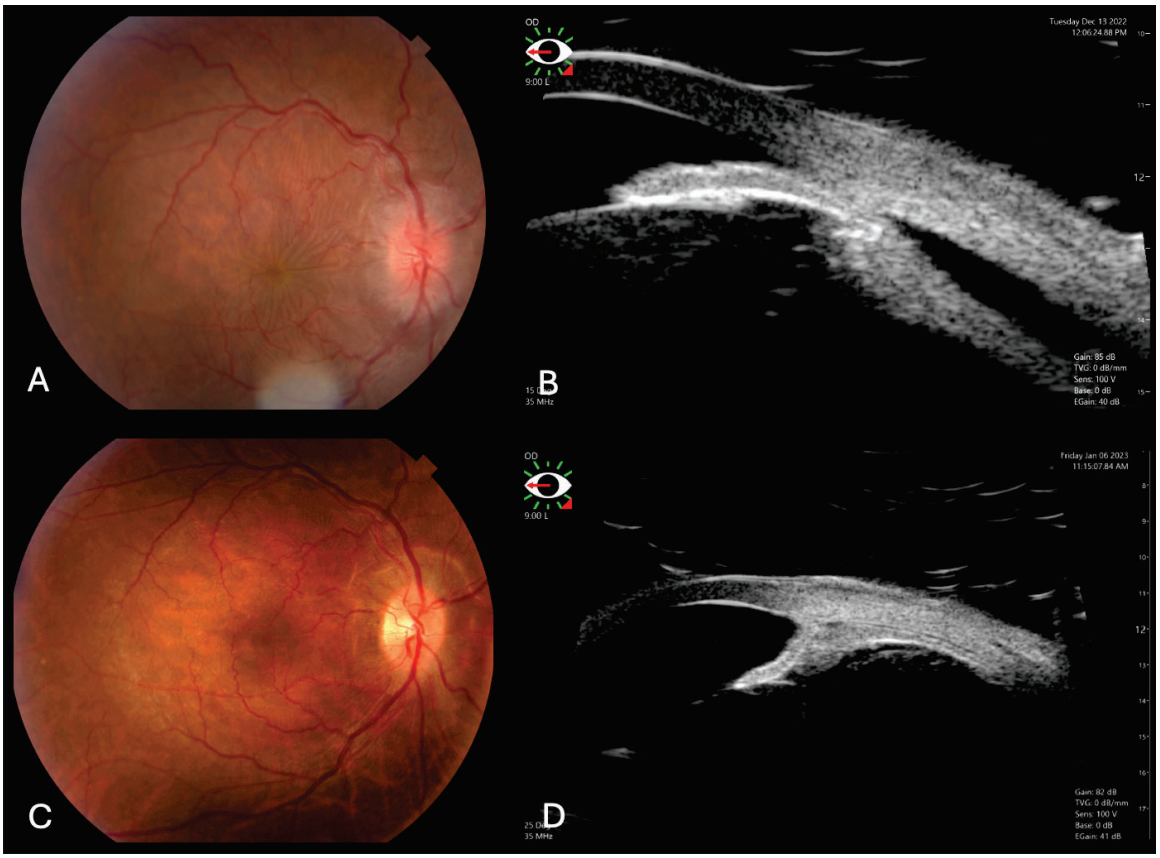
Objective: To evaluate the long-term intraocular pressure control following Combined Vitrectomy and Reduced-Dose Transscleral Diode Laser Cyclopexy for the management of extensive cyclodialysis clefts
Purpose: A vitreoretinal approach is necessary when a patient presents with cyclodialysis clefts alongside vitreoretinal lesions resulting from ocular trauma, especially in cases of extensive traumatic cyclodialysis where the effectiveness of less invasive treatments is limited. We present a reproducible approach that addresses cyclodialysis clefts and associated vitreoretinal complications resulting from ocular trauma in a single surgical procedure.

Methods: This single-center, prospective interventional case series study involved 13 eyes from 13 patients who were consecutively diagnosed with large traumatic cyclodialysis clefts, accompanied by other vitreoretinal complications, and treated at the Retina Department. All patients underwent vitrectomy with SF6 gas tamponade and low-dose transscleral laser photocoagulation and were placed in a supine position for three days postoperatively. During the pars plana vitrectomy, the vitreous cavity was completely filled with air, allowing for a transient apposition of the ciliary body to the sclera, which facilitated the application of transscleral laser therapy. Our objective was to achieve a controlled thermal laser burn to induce cyclopexy, utilizing a laser power of 1000 mW with an exposure time of 2 seconds. To be included in the study, patients were required to have a cyclodialysis extending at least six clock hours and to be followed for a minimum of twelve months. Exclusion criteria consisted of loss to follow-up and the need for a second vitreoretinal surgery.
Examinations included measurements of BCVA, tonometry, slit-lamp biomicroscopy, indirect ophthalmoscopy and ultrasound biomicroscopy.

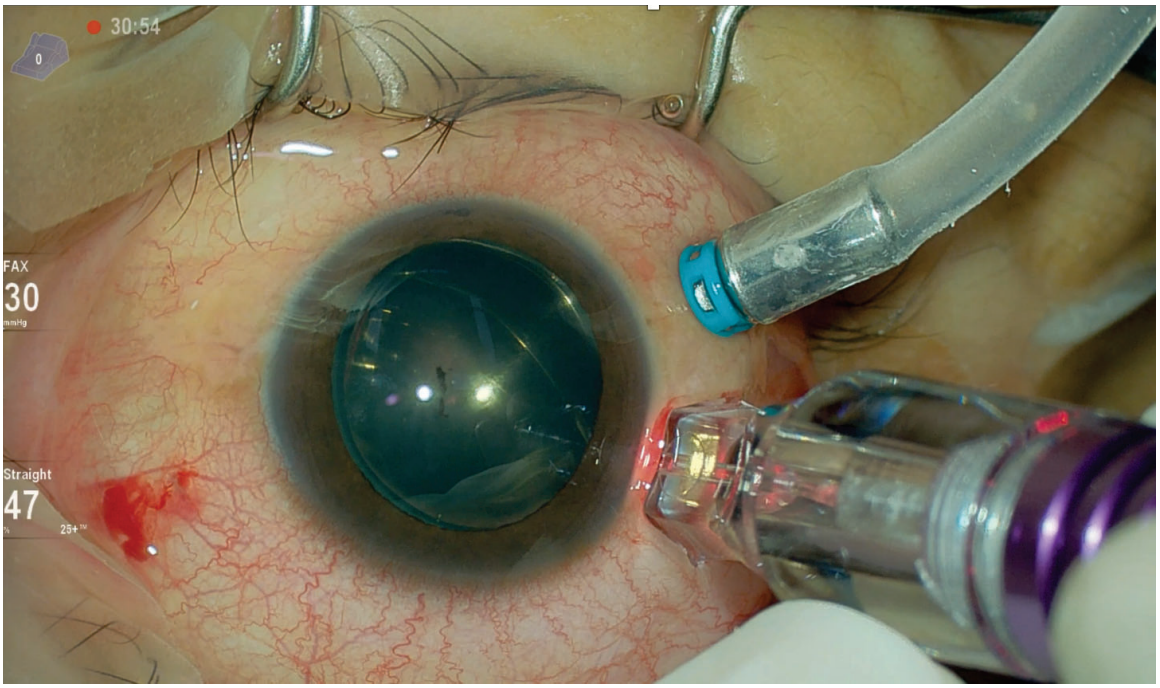
Results: The mean age was 44.9 ± 14.4 years, with 76.9% being male. Out of the 13 patients, eight underwent surgery on the right eye. Regarding the status of the lens, there were pseudophakic, four presented traumatic cataracts, and six had clear lenses. Regarding the cyclodialysis extension 46.2% (n=6) had a 360° cyclodialysis, five patients had a 270° extension, and only two had a 180° extension.
The vitreoretinal-associated comorbidities included hypotonic maculopathy in 46.2% of cases (n=6). Meanwhile, submacular hemorrhage, choroidal rupture, vitreous hemorrhage, and choroidal detachment each represented 15.3% (n=2) of cases.
Control of IOP was achieved with a single procedure in 100% of cases. The mean intraocular pressure measured in mmHg before surgery was 4.4 ± 1.9. Postoperatively, the mean IOP was 26.3 ± 4.7 on day 1 and decreased to 13.2 ± 2.4 at 12 months. Seven patients required hypotensive treatment at some point during follow-up, and only two individuals (15.4%) needed to continue hypotensive treatment after the 12-month follow-up. The mean preoperative visual acuity (logMar) was 1.4 ± 0.5, while the mean postoperative visual acuity at 12 months was 0.9 ± 0.5. A total of 76.9% (n=10) of the patients experienced an improvement in visual acuity. The average time elapsed between the ocular trauma and surgery was 32.7 ± 17.8 days.

Conclusion: This technique is highly effective and reproducible, as it does not necessitate specialized suturing skills, making it accessible for any retina specialist to implement. It serves as an alternative to cryopexy, which is associated with a significant inflammatory response. The modest improvement in best-corrected visual acuity (BCVA) and the requirement for ongoing hypotensive eye drops in certain patients may be attributed to other complications related to trauma.

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Hypotony maculopathy before and after treatment. Clinical images and UBM



Transscleral laser application with G probe

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Modified Simple Silicone Materials in T-Shaped Macular Buckling Surgery

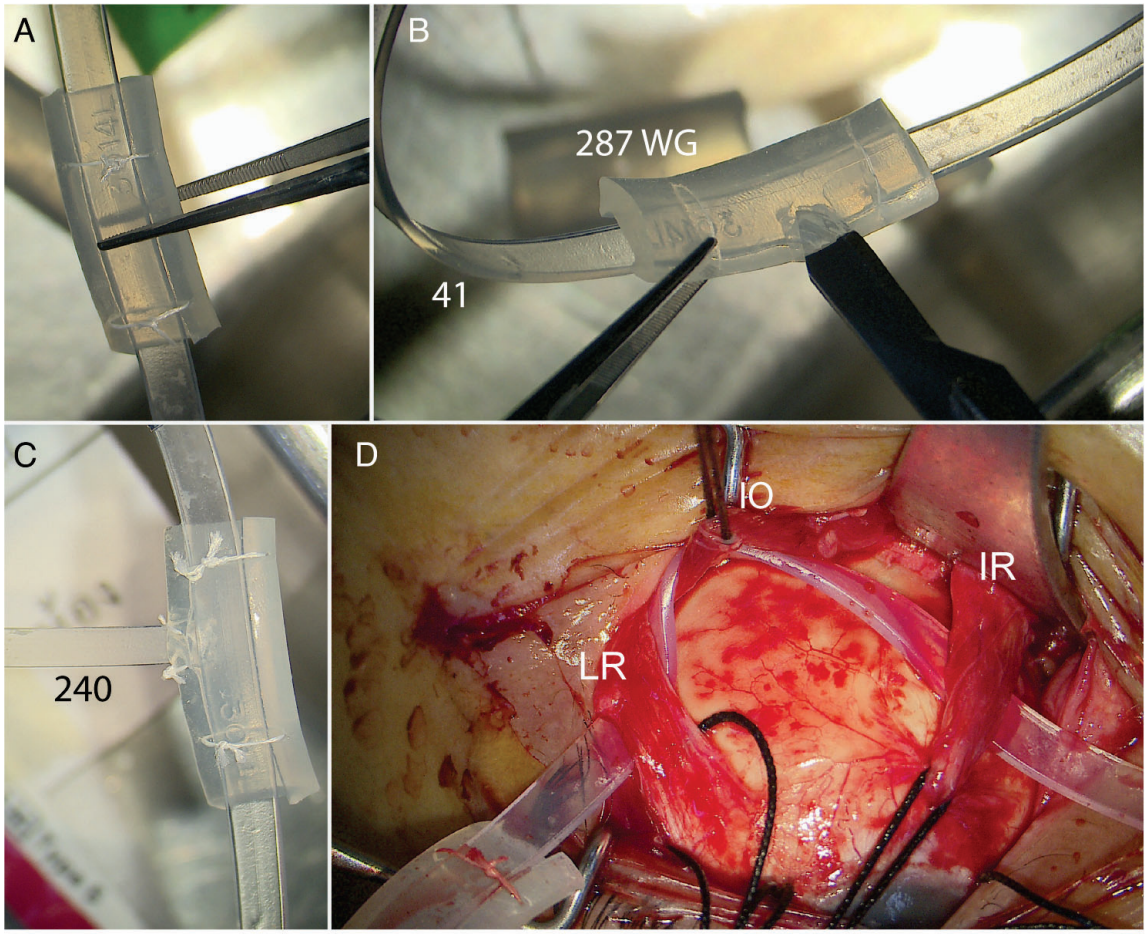


- Yodpong Chantarasorn, MD
- Chairat Saovaprut, MD

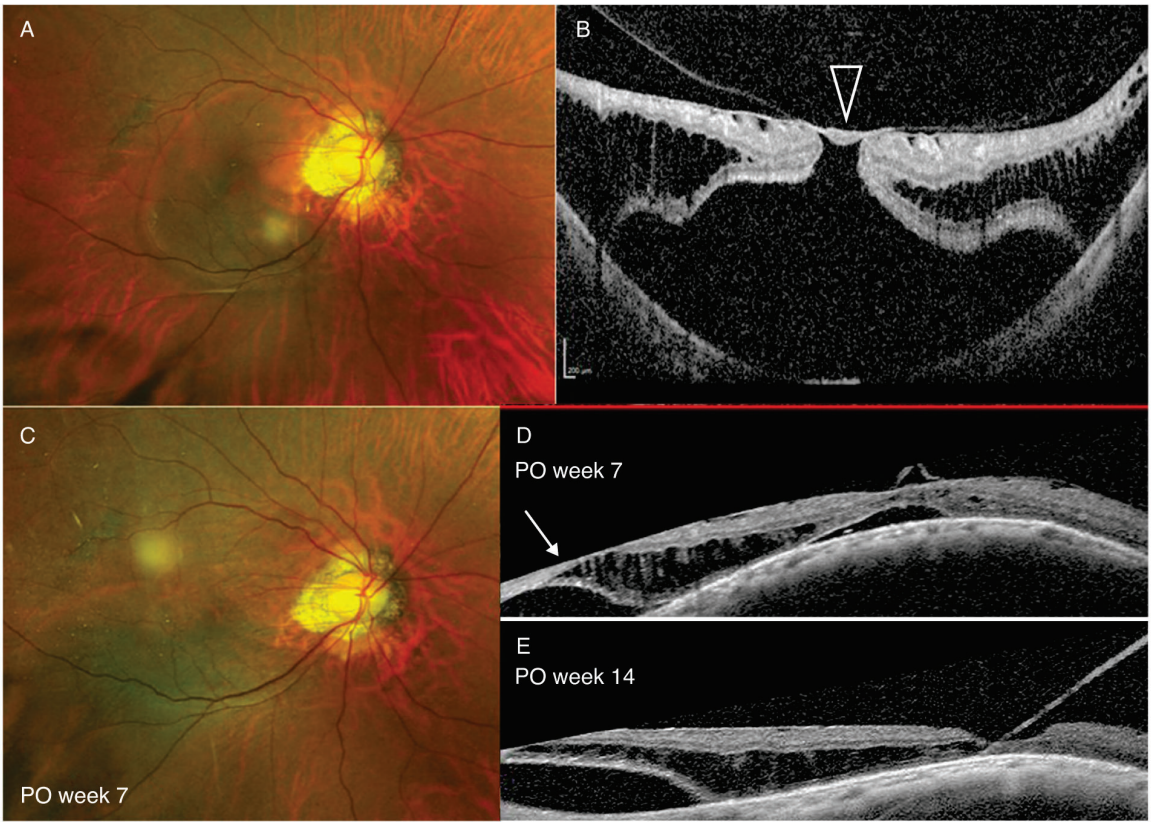
Objective: To describe a novel and simple approach for conducting macular bucking surgery (MBS) in myopic traction maculopathy (MTM), and to report morphologic and functional outcomes at 6 months.
Purpose: Patients having MTM with macular detachment could display an inadequate response post-ILM removal as there are no supporting structures for the inner retina against the ELM. Furthermore, most techniques previously described are based on the principle of temporal approach without a suspension of inferior oblique muscle, where they require exposure of the deep posterior aspect of the temporal sclera, with a rigid handle close to lateral rectus (LR) or even the needs of perioperative disinsertion of LR muscle. These may result in prolonged operative time, surgical complexity, and postoperative strabismus.
Methods: This retrospective cohort study included patients, diagnosed with MTM and no significant tractional membranes, who reached the stage of macular detachment and beyond. They underwent MBS with (4 eyes) or without (18 eyes) vitrectomy for macular detachment, macular hole, or macular hole associated retinal detachment. The silicone materials commonly utilized in retinal detachment surgeries were modified to a T-shaped buckle. The posterior pole was indented through a vertical approach, without the need for exposing the deep posterior sclera or detaching the lateral rectus.
Results: Preoperative characteristics of 22 patients (22 eyes) included an average age of 67.2 years and BCVA ranging from 20/400 to hand movement. Fifteen patients with macular detachment who underwent MBS alone had the mean postoperative 6-month visual acuity improved to 20/125, with the median duration for the foveal reattachment of 3.5 months. One had MBS alone for myopic-macular hole with an adherent operculum. Two with macular hole-associated early-stage retinal detachment underwent macular buckling surgery following by pure sulfur hexafluoride injection as a staged procedure. The rest (4 eyes) had macular buckle combined with vitrectomy, fluid-gas exchange, and ILM inversion (for macular hole with total RRD). Mean axial length reduced from 29.9 ± 2.4 mm preoperatively to 28.2 ± 3.09 mm at 6 months post-surgery. Three patients (18%) had inadequate buckling effects while two of them required subsequent PPV. All patients achieved final retinal reattachment while three (13.6%) had persistent flat-open macular hole. The most common complication was self-limited subretinal hemorrhage (3 cases). None of the patients developed macular atrophy at the final visits.

Conclusion: This method relies on common ophthalmic devices and showed the positive anatomical outcomes (>80% reattachment, 87% MH prevention), which indicates its potential reproducibility. It also can serve as a preliminary option for this patient group without having to perform complex internal approach.

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The creation of a 3-armed macular buckling segment



MBS for macular detachment closed to the development of macular hole

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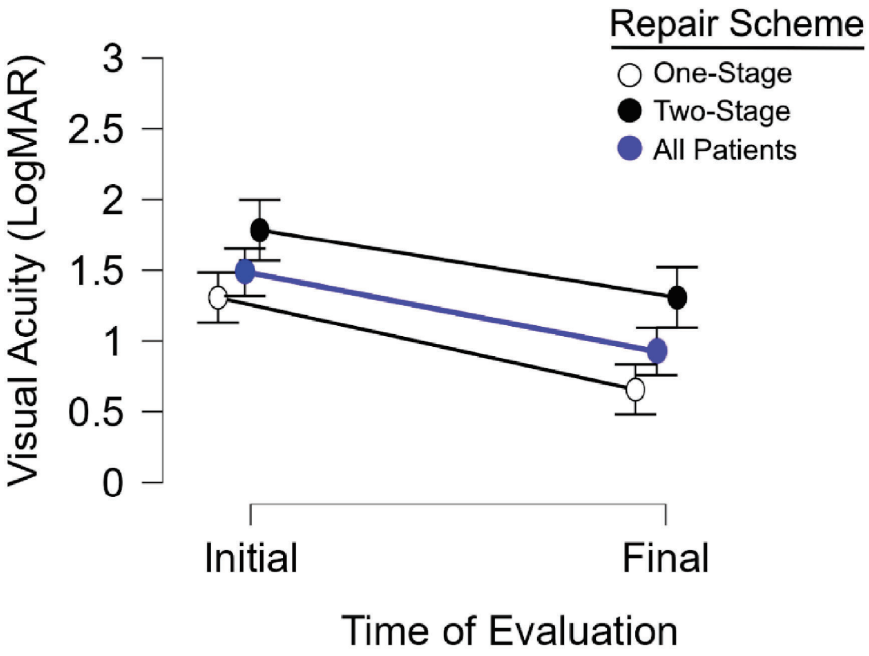
Visual Outcomes After 1-Stage vs 2-Stage Surgery for Intraocular Foreign Body Removal and Open-Globe Repair, Multicenter Study



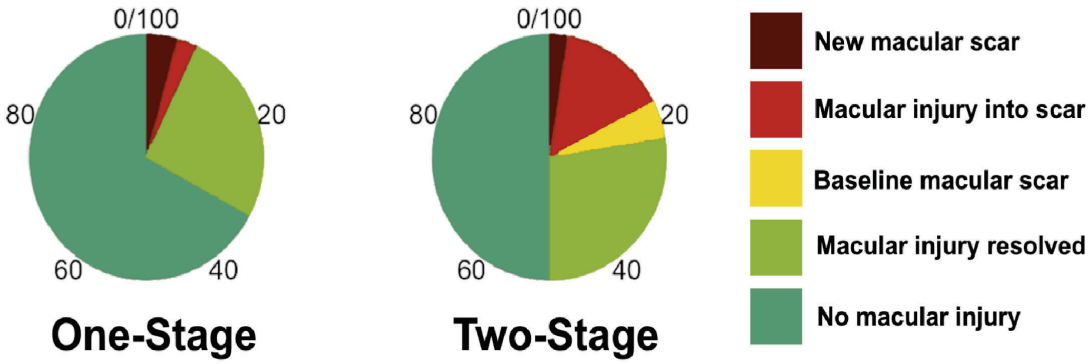
- Jinghua Chen, MD, PhD
- Anjay Shah
- Yujia Zhou
- Ramya Singireddy
- Navnit Mohan
- Madison Kerley
- Khoi Do
- Abdulla Shaheen
- Nicolas Yannuzzi
- Wei Wang
- Gibran Khurshid
- Noy Ashkenazy, MD, MS

Objective: To compare visual outcomes and complications between one-stage and two-stage surgical repair for intraocular foreign body removal across multiple academic centers.
Purpose: Management of intraocular foreign bodies (IOFB) requires addressing the entry wound, typically through open globe injury repair, unless the injury is small enough to self-seal. The decision between a one-stage and two-stage repair is often individualized to the patient's condition and IOFB characteristics. There is not yet strong evidence for better outcomes in either treatment scheme.
Methods: This study is a multi-center retrospective cohort analysis of IOFB outcomes, pooling data from four major academic eye centers. The cohort includes patients who presented to the above centers with IOFB and received surgical treatment between January 1, 2000, and December 31, 2021. Patients with <90 days of follow-up were excluded due to insufficient follow up for vision rehabilitation. Few patients were truly lost to follow-up. At the time of data sharing, some patients had been injured less than 90 days prior. This exclusion was also influenced by data validation challenges and delays exacerbated during the COVID-19 pandemic. One-stage protocol was defined as repair in which the IOFB was extracted at the time of primary open globe injury (OGI) repair, even if the patient required subsequent rehabilitative surgeries. Two-stage protocol was defined as any repair in which IOFB extraction was performed separately from the primary open globe repair. The choice of protocol often depended on the severity and complexity of injuries, with one-stage repair being more feasible in eyes that were more amenable to immediate management.
The Chi-square test of independence was used to compare cohort characteristics, exam findings, and secondary outcomes compared by site and treatment scheme. For highly skewed variables such as time interval, medians were reported instead of means and standard deviations (SDs). Age, VA, and time intervals were compared by Mann-Whitney U-test and IOP was compared by Student's t-test. Multiple repeated-measures analysis of variance (ANOVA) was used to detect within-subject effects (i.e., time point), between-subject effects (i.e., vision stratum and treatment scheme), and multivariate interactions affecting final VA. Holm-Bonferroni post-hoc tests were conducted for significant comparisons.
Results: Amongst the four participating centers, 149 patients were injured by an IOFB, and 39 patients were excluded for having fewer than 90 days of follow-up data due to <90 days of follow-up, of which only 2 were definitively lost to follow-up. The remaining exclusions were due to patients who had not yet reached the follow-up threshold at the time of data sharing specified by institutional agreement. For the remaining 110 patients, most patients were male (96.4%), and most repairs were performed in one-stage (63.6%) versus two-stages (36.4%). Mean age at time of presentation was 38.5 (SD 11.4) years, and the median length of follow-up was 370.5 days, ranging from the inclusion threshold of 90 days to a maximum of 4124 days. On average, patients presented within 3 days of injury. MedianThe median time to surgery was 1 (range 1-90) days (Figure 1c). For the 40 (36.4%) patients receiving two-stage repair and IOFB removal, median time between surgeries was 7 (range 0-67) days. Mechanisms of injury involved manual labor in 94 cases (85.5%), and IOFB material was metallic in 100 (90.9%) of injured patients. Overall, visual acuity improved after both one-stage ($\Delta VA = -0.690$) and two-stage ($\Delta VA = -0.234$) repairs, but one-stage repair was associated with greater vision improvement ($p = 0.009$). Patients with better initial vision overall had vision decreases ($\Delta VA = 0.157$), while patients with worse initial vision had vision improvements ($\Delta VA = -1.101$), and one-stage repair was associated with better vision outcomes independent of initial vision ($p = 0.337$). One-stage repair was associated with lower rates of macular scarring ($p = 0.020$), which was associated with worse vision outcomes ($p = 0.001$). Endophthalmitis rates were not significantly different for each treatment group (12.9% vs 10.0%, $p = 0.655$). The number of additional surgeries did not differ significantly between treatment groups.
Conclusion: The choice between one-stage and two-stage intraocular foreign body repair is often based on injury characteristics, institutional capabilities, and surgeon expertise. This multi-center retrospective analysis demonstrates that one-stage surgical approach for IOFB repair is associated with better vision outcomes at a follow-up of >90 days. Additional prospective study would be needed. Sampled practice patterns show that the decision to perform a two-stage repair is associated with poor initial vision, scleral laceration, hyphema, and vitreous hemorrhage. It may not always be feasible or recommended to perform one-stage repair. Endophthalmitis rates are similar for one-stage and two-stage repairs.

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Vision change was significantly different between treatment groups



Incidence of macular scar was higher in the two-stage group

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Low-Dose Atropine 0.01% Drops for Symptomatic Vitreous Floaters: A Noninvasive, Safe, and Effective Therapeutic Option



- Mohsin Ali, MD
- Jeanette Du, MD
- Osama Sabbagh, MD
- Brian Do, MD
- J. Mingyi Huang, MD
- Joshua Levinson, MD
- Alexander Melamud, MD, MA
- Mohammed Barazi, MD

Objective: Is low-dose atropine 0.01% safe and effective for the treatment of persistently symptiomatic vitreous floaters?
Purpose: Therapeutic options for persistently symptomatic vitreous floaters include vitrectomy and laser vitreolysis, both of which have a risk of vision-threatening complications. No well-established pharmacologic options currently exist. The objective of this study is to assess whether topical low-dose atropine 0.01% may be an effective option for alleviating floater symptoms as measured by scores on a modified National Eye Institute Visual Function Questionnaire (NEI VFQ-25).
Methods: This is a retrospective case series conducted at the Retina Group of Washington. Adult patients with persistently symptomatic vitreous floaters and either vitreous syneresis without posterior vitreous detachment (PVD) or history of PVD for at least 3 months were included. Subjects with significant vitreoretinal pathology, significant media opacity, anatomic narrow angles, or history of pars plana vitrectomy were excluded. Patients completed a modified NEI VFQ-25 prior to use of topical low-dose atropine 0.01% drops daily for one week. The same questionnaire was then completed after the one-week period to assess treatment response. The primary outcome measure was satisfaction with the drops as measured by the NEI VFQ-25. Questions targeted to assess the primary outcome were “How satisfied are you with the results of applying drops for troubling vitreous floaters?” and “With your experience in mind, would you continue to apply these drops for troubling vitreous floaters?” Secondary outcomes were changes in scores on specific dimensions of self-reported health status related to general health and vision, difficulties with activities, driving, behavior, and adverse effects. Statistical analysis was performed using the Fischer’s exact test or Chi-squared test for independent proportions and t-test for independent samples. P-values less than or equal to 0.05 were considered statistically significant.
Results: A total of 44 patients received atropine 0.01% drops prescribed for daily application in either one or both eyes. There were 22 patients who completed at least 7 days of consecutive drop use. Of these, 13/22 (59.1%) patients were “satisfied” or “very satisfied” with the drops and 11/22 (50%) patients reported that they would continue using the medication. Considering all patients who received the medication and under the assumption that discontinuation prior to 7 days of daily use was due to dissatisfaction, there were 13/44 (29.5%) patients who were “satisfied” or “very satisfied” with the drops and 11/44 (25%) patients who would continue use of the drops. The mean age of satisfied and unsatisfied patients was 60.7±10.5 years and 59±9.5 years, respectively (p=0.703). There was no significant relationship between iris color (blue or non-blue) and drop satisfaction (p=0.648). There was no significant relationship between phakic status and satisfaction (p=0.520) or desire to continue the medication (p=0.730). Presence or absence of PVD was also not significantly associated with satisfaction (p=0.520) or desire to continue drops (p=0.730). Of patients who trialed the drops, one elected to undergo YAG vitreolysis and 4 eventually underwent vitrectomy for floaters during the follow-up period of 8.9±2.5 months. The most common adverse effects reported were worsened near vision in 4/22 (18.2%) patients, worsened distance vision in 4/22 (18.2%) patients, and light sensitivity in 4/22 (18.2%) patients. Of the 4 patients who reported worsened distance vision, 2 were still satisfied overall and wished to continue the drops. Of the 4 patients who reported worsened near vision, 3 were still satisfied overall and wished to continue the drops. Of the 4 patients who reported worsened photophobia, 3 were still satisfied overall and wished to continue the drops.
Conclusion: Our study is the first to demonstrate that low-dose atropine 0.01% eye drops may be an effective, non-invasive treatment option for select patients with persistently symptomatic vitreous floaters due to vitreous syneresis or posterior vitreous detachment. Because of these results, we believe that low-dose atropine can be a reasonable, non-invasive, therapeutic alternative to patients with persistently symptomatic vitreous floaters, regardless of posterior vitreous detachment status or iris color, that may serve either as a long-term solution, pro re nata (PRN, “as needed”) treatment, or temporizing measure while considering more invasive options such as vitrectomy and laser vitreolysis or until their floaters (or adaptability of their floaters) improve with time.

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