surgery (side port in phacoemulsification). In 3 groups water tigth clousure was analyze at day one, 1 week and 1 month after surgery. Complete biomicroscopy, intraocular pressure and anterior segment optical coherence tomography were perform in every visit.
Results: Safe, water tigth incisions were documented in all cases. When performing these novel maneuver we notice minimal resistance and strength needed to introduce the trocars, with excellent maneuverability and subsequent tigthness and no leaking after finishing the case.
Conclusions: These 2 novel techniques in performing sclerotomies in transconjunctival sutureless small gauge vitrectomy its a safe procedure, and it is superior to conventional technique when using resterilized material.
Commercial Relationships: Efrain Romo-Garcia, None; **David Magana**, None; **Julio Cesar Ceja Aguilar**, None; **Romulo Perdomo-Martinez**, None; **Carolina Cardona**, None; **Jesús Ramón Alvarez-Félix**, None; **Sergio Sital-Gastelum**, None; **Silvia Lizarraga-Velarde**, None

Program Number: 5835 **Poster Board Number:** C0071
Presentation Time: 8:00 AM–9:45 AM
In office gas-fluid exchange and face-down positioning for treatment of refractory macular edema in post-vitrectomy patients
Ian D. Kirchner, Ruby Parikh, Corey Waldman, Olga Shif, Philip H. Scharper. Ophthalmology, Sinai Hospital of Baltimore, Baltimore, MD.
Purpose: To determine the efficacy of an in-office complete gas-fluid exchange (GFX) and face-down positioning for treatment of refractory diabetic and cystoid macular edema (ME) in post-vitrectomy patients.
Methods: We performed a retrospective review of 10 eyes from 9 patients who underwent an in-office complete GFX and face-down positioning for persistent ME. One eye was excluded for a simultaneous diagnosis of serous retinal detachment at the time of the procedure. Patients were treated between November 2011 and November 2015 at the Krieger Eye Institute in Baltimore, Maryland. A complete GFX was performed with a non-expansile concentration of C3F8 gas. Patients were asked to maintain face-down positioning for one week. Outcome measures included post-GFX visual acuity (Va), measured using Snellen acuity and converted to logMAR notation, as well as post-GFX central subfield thickness (CST) determined by ocular coherence tomography (OCT) (Cirrus, Zeiss). Finally, OCTs were obtained during the post-GFX period to determine whether complete resolution of ME was achieved and maintained.
Results: 9/9 eyes had improvement in Va, with a mean logMAR acuity of 0.958 (20/182) pre-GFX improving to 0.449 (20/56) post-GFX. Mean CST improved from 375 uM pre-GFX to 336 uM post-GFX. While 9/9 of eyes also demonstrated improvement on OCT, only 2/9 (22%) achieved complete resolution of CME. Follow-up ranged from 5 weeks to 12 months, with a mean of 4.4 months. No patients had significant complications from the procedure.
Conclusions: An in-office complete GFX and face-down positioning was effective in improving Va and CST in post-vitrectomy patients with refractory ME. Additional studies are needed to determine its overall efficacy as a novel approach for providing complete and permanent resolution.
Commercial Relationships: Ian D. Kirchner, None; **Ruby Parikh**, None; **Corey Waldman**, None; **Olga Shif**, None; **Philip H. Scharper**, None

Program Number: 5836 **Poster Board Number:** C0072
Presentation Time: 8:00 AM–9:45 AM
Improving Post-Operative Positioning Compliance: A Novel Device
Frank Brodie[1], Kelly Woo[2], Hyuck Choo[2], Robert Grubbs[2]. [1]Ophthalmology, University of California San Francisco, San Francisco, CA; [2]California Institute of Technology, Pasadena, CA.
Purpose: The use of intraocular gas for repair of retinal detachments and macular holes is a mainstay of vitreoretinal surgery. Post-operatively, the patient is positioned so that the gas bubble is in apposition to the retinal pigment epithelium. In order to ensure correct position of the gas bubble against these breaks, patients are instructed in specific postoperative positioning of their head. In spite of instructing patients on the importance of proper head positioning after use of intraocular gas, numerous studies have shown patients are not compliant with the prescribed regimen. Our novel positioning device provides real time alerts when the bubble is out of position in the eye and allows patients to correct their position.
Methods: A prototype of the post operative positioning device was built and tested to determine fidelity between sensor alert and bubble position in a model eye. The site of retinal break was marked in the model eye and gas bubbles were tested in three axes of rotation at progressive amounts of deviation. Each of these was repeated with three different intraocular bubble sizes, representing the absorption of CF_6 gas at post-operative day 1, 3 and 5. Agreement between the positioning sensor and position of the gas bubble in the model eye was the primary outcome measure.
Results: The positioning sensor showed excellent fidelity with actual location of the gas bubble in the model eye. The sensitivity of the sensor in detecting the bubble being off the break in the model eye was 100% with a specificity of 86%.
Conclusions: Our novel post operative positioning device proved highly reliable in detecting when the intraocular bubble was off the break. Having shown that our sensor can accurately detect when the intraocular gas bubble is out of position *in vitro*, we plan to proceed with *in vivo* testing of not only sensor fidelity, but how it affects patient behavior and ultimately outcomes in the post operative period. Future designs for our sensor will miniaturize the device, provide wireless connectivity for tracking compliance, adjusting sensitivity and providing audible and vibrating alerts.
Commercial Relationships: Frank Brodie, None; **Kelly Woo**, None; **Hyuck Choo**, None; **Robert Grubbs**, None

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Presentation Time: 8:00 AM–9:45 AM
Concentric-tube robotic platform for non-linear trajectories in ophthalmic surgery
Isdin Oke[1], Tomer Anor[1, 2], Joseph Madsen[1, 2], Ankoor Shah[1, 3]. [1]Harvard Medical School, Boston, MA; [2]Neurosurgery, Boston Children's Hospital, Boston, MA; [3]Ophthalmology, Boston Children's Hospital, Boston, MA.
Purpose: Concentric, curved cannulae are utilized in neurosurgical procedures to access difficult-to-reach areas of the brain. Similarly, they may provide a novel platform for performing ophthalmalic procedures so that the eye remains motionless as the instrument navigates within the globe. As a proof of concept, we aim to computationally determine the simplest robotic configuration that will allow for complete access to the retina from a fixed entry angle while avoiding critical structures.
Methods: We segmented MRIs to generate adult eye models. Using the Matlab optimization toolbox, we developed an algorithm to calculate curved, intraocular trajectories that minimizes the distance from the instrument tip to retinal targets while constraining the