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Sutureless Trocar-Cannula Based Transconjunctival Flanged Intrasccleral Intraocular Lens Fixation



- Mark K. Walsh, MD, PhD

OBJECTIVE To teach attendees a novel sutureless scleral intraocular lens (IOL) fixation technique that involves melting the tips of the IOL haptics to form flanges or bulbs to prevent haptic slippage.

PURPOSE Sutureless scleral tunnel (SST) IOL fixation has gained popularity because it theoretically decreases the risk of late IOL dislocation relative to suture-fixated IOLs. Early dislocation of SST-fixated IOLs is still possible though, especially when repositioning an old IOL with thinner or shorter haptics. Thus we have created a novel technique to mitigate both early and late IOL dislocation.

METHODS We combine Yamane's flanged intrascleral IOL fixation technique (American Society of Cataract and Refractive Surgery Annual Meeting 2016, film submission) with 27g trocar-cannula based scleral tunnel creation (Yonekawa Y et al. OSLI Retina, 2016; Todorich B et al. OSLI Retina, 2016) to create a novel technique for 3-piece IOL fixation in the setting of inadequate lens capsule support. The key is melting the tips of the haptics to form bulbs or flanges to keep the haptics from slipping out. We present a retrospective review of a single surgeon case series of the first 11 cases of

transconjunctival trocar-cannula based flanged intrascleral IOL fixation with greater than 3mo of follow-up.

RESULTS Using this novel flanged IOL fixation technique, the first 11 eyes with >3 months of follow-up have revealed no cases of IOL dislocation, subluxation, decentration, tilt, haptic extrusion or exposure, retinal detachment, corneal decompensation, vitreous hemorrhage, iris IOL capture or endophthalmitis. 4/11 (36%) cases were IOL repositions, 4/11 (36%) were IOL exchanges (e.g., exchange of a 1-piece acrylic IOL for a 3-piece IOL), and 3/11 (27%) involved secondary IOL placement for aphakia. There was one case of post-operative cystoid macular edema treated successfully with eye drops only and one case of mild asymptomatic cystoid macular edema. Additionally, one patient was noted to have a mild asymptomatic perfused central retinal vein occlusion at his post-operative month 3 visit that was observed and thought to be unrelated to his ocular surgery. Illustrative surgical videos will be shown as well as data from more recent cases with follow-up out to 1 year.

CONCLUSION Despite relatively short-term follow up, our results to date have been encouraging. This flanged intrascleral IOL fixation technique theoretically decreases the risk of IOL dislocation due to the bulbed or flanged IOL haptic tips. Additionally, since this technique is performed transconjunctivally, operative times appear to be shorter with quicker and more comfortable patient recovery.

TAKE HOME MESSAGE Transconjunctival trocar-cannula based flanged intrascleral IOL fixation is a novel technique for IOL fixation in the absence of capsular support that has theoretical advantages over older techniques.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Exempt from approval

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Combined Pars Plana Vitrectomy and Scleral Fixation of an Intraocular Lens Using Gore-Tex Suture: One-Year Outcomes and Comparison to ACIOL Placement



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OBJECTIVE To report the one-year visual outcomes and postoperative complication profile of combined pars plana vitrectomy (PPV) and scleral fixation of an intraocular lens (IOL) using Gore-Tex suture.

PURPOSE To describe the one-year clinical outcomes of combined PPV and ab externo scleral fixation of an IOL using Gore-Tex suture and compare them to a treatment alternative, namely ACIOL placement.

METHODS Retrospective, interventional case series. Outcome measures were change in visual acuity and occurrence of intraoperative and postoperative complications with minimum follow-up of 1 year. In a sub-analysis, outcomes of eyes undergoing the surgical technique for retained lens material (RLM) or dislocated IOL were then compared to a contemporary cohort of eyes undergoing PPV and ACIOL placement.

RESULTS 84 eyes underwent combined PPV and scleral fixation of an IOL using Gore-Tex suture. Mean visual acuity improved from 20/782 to 20/65 ($p < 0.001$) at mean follow-up of 598 days. Postoperative complications included transient vitreous hemorrhage in 6 eyes (7.2%), cystoid macular edema in 4 eyes (4.8%), and ocular hypertension in 3 eyes (3.6%). There were no cases of endophthalmitis, suture erosion/breakage, retinal detachment, or persistent inflammation during the follow-up period. In the sub-analysis, 31 eyes undergoing the technique for RLM and dislocated IOL were compared to 31 eyes which underwent PPV and ACIOL placement for the same indications. Groups were matched for patient age ($p=0.18$) and preoperative visual acuity ($p=0.48$). At final follow-up, visual acuity was similar between groups (20/56 vs. 20/51, $p=0.74$). Eyes undergoing ACIOL placement were more likely to have postoperative corneal edema ($p=0.03$), hyphema ($p=0.35$), and ocular hypertension ($p=0.67$).

CONCLUSION Combined PPV and ab-externo scleral fixation of an IOL with Gore-Tex suture was well tolerated at a minimum of one year follow-up. No suture-related complications were encountered. Compared to PPV and ACIOL placement, this technique yielded similar visual acuity outcomes with lower rates of post-operative complications, particularly in regards to corneal edema.

TAKE HOME MESSAGE Scleral fixation of an IOL with Gore-Tex suture was well tolerated at a minimum of one year follow-up, with good visual acuity outcomes and low rates of post-operative complications.

HUMAN RESEARCH This study involves human research.

IRB Approval Status: Approved by institutional review board

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A Simple, Safe and Reproducible Surgical Technique For Intrasccleral Fixation of IOL Haptics Using Scleral Belt Loops at a Preset Depth



- Kamal Kishore, MD, MBBS

OBJECTIVE To describe a modified technique for safe, secure and consistent intrasccleral fixation of IOL haptics.

PURPOSE Current techniques of intrasccleral fixation of IOL haptics (Scharioth 07, Agarwal 08, Prenner 12) involve incarceration of C-shaped haptics in straight tunnels made “freehand” that may result in astigmatism from torque or tilt. Belt loops (Michels '86) can be used for intrasccleral fixation of IOL haptics. The original technique (Kishore ASRS 14) was modified to enhance its safety and consistency

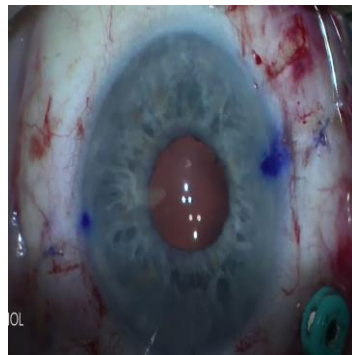
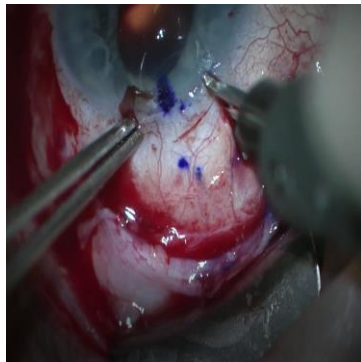
METHODS After limited peritomy, marks for 20-g sclerotomies are placed on the sclera 2.5 mm posterior to limbus at 12 and 6 O'clock. 3X3 mm belt loops are fashioned with a guarded LRI blade set at 300 microns and a #66 blade in the orientation of haptics adjacent to, and centered on the marks. A 3 piece lens (Staar collamer CQ2015a) is injected into the AC through a 2.65 mm clear cornea incision. The haptics are grasped with Alcon 25-g serrated forceps and transferred to a 23-g MST microholding forceps

which grasps the tip to exteriorize them through 20-g sclerotomies followed by their placement inside the belt loops. After ensuring centration, 7-0 Vicryl suture or fibrin glue secures the haptics

RESULTS This modified technique has been used in five eyes with excellent centration of IOL and no intraoperative or postoperative complications. Three were performed to correct aphakia, and one each to exchange dislocated one-piece acrylic IOL-capular bag complex, and a subluxated three piece silicone IOL. I have previously encountered torque-induced astigmatism and exposure of haptics due to one of the tunnels being too shallow. It is important to avoid IOLs that have too rigid (brittle) haptics and those with square anterior optic edge. Proper technique of injection of a three piece lens into the AC avoids “flipping” of optic will be explained in a video.

CONCLUSION Creation of belt loops at a set depth for fixation of IOL haptics eliminates torque or tilt, and guards against the roof of the tunnel from being too thin that may result in erosion of haptics through the sclera.

TAKE HOME MESSAGE Belt loops fashioned at a preset depth of 300 microns provide safe, secure and reliable intrascleral fixation of IOL haptics.



HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

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Longer-Term Outcomes of a Novel Surgical Approach For IOL Fixation Using Gore-Tex Suture



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- Stuart N. Green, MD
- Caroline Vloka
- Scott Halperin

OBJECTIVE To report the long-term outcomes of a novel surgical technique for intraocular lens (IOL) fixation.

PURPOSE To report the long-term outcomes of a novel surgical technique for scleral fixation of a CZ70BD single piece IOL utilizing vitrectomy and scleral fixation with Gore-Tex suture. A cow-hitch knot is employed to generate four- point IOL fixation.

METHODS Retrospective review of a consecutive series of patients who underwent a novel sutured IOL procedure. Fifteen eyes from 15 consecutive patients with a subluxated crystalline lens or IOL were included. All patients were followed for at least six months after surgery. Patients underwent pars plana vitrectomy followed by a scleral-fixated CZ70BD IOL using Gore-Tex suture and four-point fixation via a cow- hitch knot. Outcomes data were obtained and analyzed.

RESULTS The mean patient age recruited for this study was 66 years old (66 ± 19 years). There were 13 males and 2 females. The mean pre-operative logMAR visual acuity was 1.2 ± 0.75 (Snellen 20/320). The mean visual acuity 3 months after the surgery ($n = 15$) was logMAR 0.55 ± 0.56 (Snellen 20/70) and 6 months after was logMAR 0.45 ± 0.43 (Snellen 20/60). The most common early post-operative complications were transient

ocular hypertension (n = 5), cystoid macular edema (n = 5) and microhyphema (n=2) that resolved with topical medications. Late complications included a case of subclinical peripheral retinal detachment treated with laser retinopexy (n = 1) and a case of persistent corneal edema, in a patient with Fuchs disease (n = 1). None of the patients required additional procedures for intraocular lens rescue or exchange.

CONCLUSION In the current case series the side effects were relative rare and manageable with topical medications. None of the treated eyes required re-operation for IOL-related complications like suture lysis or extrusion, IOL subluxation, or uveitis-glaucoma-hyphema type syndrome. Scleral IOL fixation utilizing vitrectomy, Gore-Tex suture and cow hitch knots is well-tolerated six months after surgery.

TAKE HOME MESSAGE The outcomes of a novel surgical technique of four-point scleral fixation of a CZ70BD single-piece IOL using cow-hitch knot and Gore-Tex suture.

HUMAN RESEARCH This study involves human research.

IRB Approval Status: Exempt from approval