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Surgery Symposium 3

Trends in Secondary Intraocular Lens Surgery Among Vitreoretinal Surgeons

- Matthew Starr, MD
- Gabriel Kaufmann
- Nick Boucher
- Chaksu Sharma

Objective: To identify changes in secondary lens techniques over time and to determine common complications of each technique.
Purpose: Secondary lens surgical techniques have begun to shift over time with the advent of novel techniques to bypass insufficient capsular support. This shift has aligned with an increased involvement of vitreoretinal surgeons in secondary intraocular lens (IOL) surgeries. This study seeks to analyze practice patterns of vitreoretinal surgeons in performing secondary IOL surgeries over time.
Methods: This study was a retrospective cohort study utilizting a nationwide aggregated electronic health care database from January 2015-December 2021. Patients were included in the study if they underwent secondary lens placement (anterior chamber IOL, scleral fixated IOL, or scleral sutured IOL) with 3 months of follow up data following the secondary lens surgery. The primary outcome was change in IOL technique over time. Secondary datapoints examined were the development of post-operative rhegmatogenous retinal detachment (RRD) following secondary IOL surgery, visual acuity changes, the development of endophthalmitis, suture erosion, haptic erosion, or corneal edema following IOL surgery.

Results: ACIOL use decreased over the 7-year period from 93% of cases to 36% of cases ($p<0.0001$), while SFIOL use increased from 3% to 34% ($p<0.0001$), and SSIOL use increased from 4% to 30% ($p<0.0001$). Visual acuity increased for each surgical technique (ACIOL: 44.1 vs. 49.2 Early Treatment Diabetic Retinopathy Study (ETDRS) letters, $p<0.001$; SFIOL: 48.7 vs. 57.6 letters, $p<0.001$; SSIOL: 51.5 vs. 61.2 letters, $p<0.001$), with larger visual acuity gains seen in SFIOL and SSIOL use (ACIOL vs. SFIOL, $p=0.004$; ACIOL vs. SSIOL, $p=0.002$; SFIOL vs. SSIOL, $p=0.64$). Average RRD rates did not significantly differ between techniques. Rates of endophthalmitis, haptic erosion, and suture erosion were low and did not significantly differ between techniques. Rates of corneal edema trended higher in ACIOL cases, but were not statistically significant (p values >0.05).
Conclusion: Rates of ACIOL implantation performed by vitreoretinal surgeons have decreased over time with more vitreoretinal surgeons electing to place either a SFIOL or SSIOL towards the end of the study period. SFIOL and SSIOL techniques may be associated with larger visual acuity changes with similar complication profiles.

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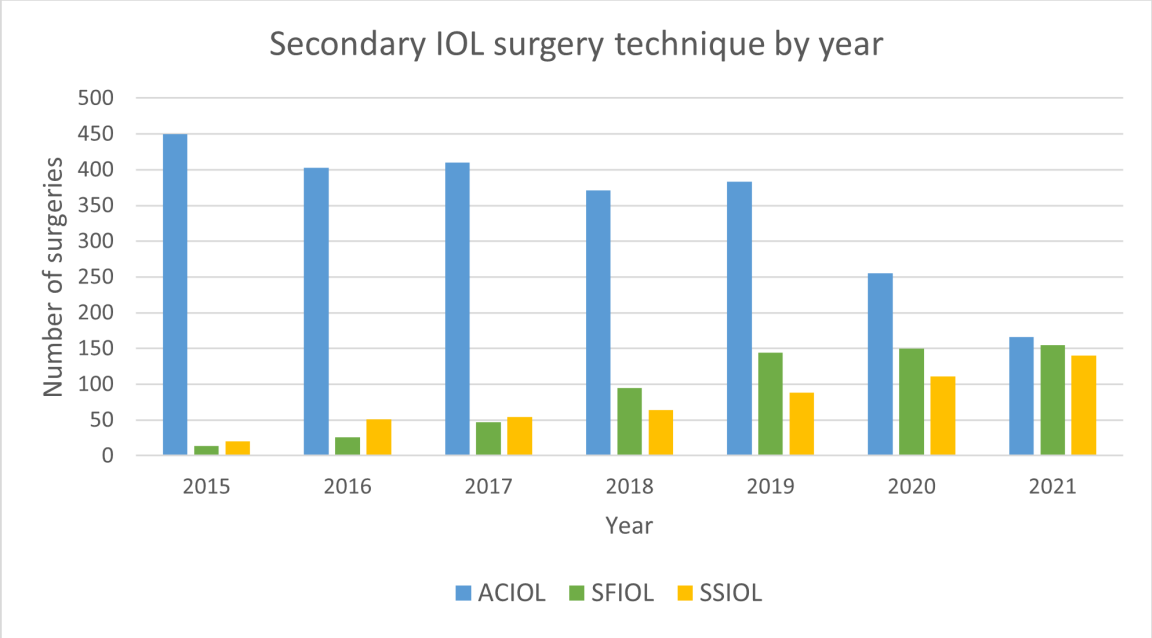

Frequency of secondary IOL technique over time.

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Relay Instrascleral 6-0 Polypropylene–Assisted Intraocular Lens Fixation: Retrospective Comparison With Modified Yamane Technique

- Yodpong Chantarasorn, MD
- Itsara Lertjirachai, MD
- Sukhum Silpa-archa, MD
- Chairat Saovaprut, MD

Objective: To describe a new surgical technique using a relay suture for optimizing sutureless scleral fixation of intraocular lens (SFIOL) in eyes with capsular insufficiency, and to compare clinical outcomes with modified Yamane's technique.
Purpose: Flanged intrascleral intraocular lens (IOL) fixation with double-needle guidance (Yamane's technique) has become rapidly integrated into the mainstream surgery for eyes with capsular insufficiency. However, despite the simplicity of the concepts, the surgical procedures may pose challenges for surgeons particularly in eyes with miotic pupils, corneal haziness, or iris damage. Furthermore, uses of a three-piece IOL with 6.0-mm optic diameter combined with a haptic push-backed maneuver may produce subclinical pseudophacodonesis and subsequent complications: optic-iris capturing, IOL tilt, and persistent macular edema. We therefore propose a simple method for IOL implantation that could maintain a concept of flapless surgery without subconjunctival heated polypropylene while utilizing the IOL platform prespecified for scleral fixation (a single-piece PMMA IOL with haptic eyelets).
Methods: A rigid IOL with haptic eyelets was fixated and held firmly against the inner scleral wall by the relay intrascleral 6-0 polypropylene sutures, where flanges were created only at the intraocular ends (Figure 1). Best-corrected visual acuity (BCVA), Visual and refractive outcomes, IOL tilt and decentration, (measured by a Scheimpflug camera), endothelial cell density, and complications were compared with the Yamane's technique modified by applying the IOL model AR40e with 1.5-mm haptic trimming at 3-, 6-, and 12-month follow-up.
Results: At 12 months, this retrospective cohort study showed that the Relay-Sutured group (n=26) demonstrated larger mean changes in corneal astigmatism (1.1 and 0.72 D; *P*=0.35), and fewer mean degrees of IOL astigmatism (0.62 vs. 1.2 diopters, *P*=0.04), compared with those observed from the Yamane group (n=27). Mean IOL tilt degree (4.1º vs. 6.2º; P = 0.09) and decentration were comparable between the two groups, but there was a trend toward increasing degrees of the IOL tilt from month 3 to 12 in the Yamane group (P = 0.04).
Significantly higher proportions of patients with complications including persistent macular edema beyond 6-month visits (14.8 vs. 3.8%; P=0.05) and iris-optic capturing (7.4% vs. 0.0%) were observed in the Yamane group than in the Relay-Sutured group. Postoperative vitreous hemorrhage (7.6%) that spontaneously resolved was exclusively found in the Relay-Sutured group. The average time spent on the SF-IOL procedures was 13.48 minutes (ranges, 10.52 to 18.40 minutes) and 12.15 minutes (ranges, 7.32 to 38.45 minutes) in the Relay-sutured and Yamane's SFIOL, respectively.
Conclusion: The Relay-Sutured technique may offer an alternative option for flapless SFIOL that provided acceptable IOL stability and complication rates, in patients not suitable for the modified Yamane's technique.

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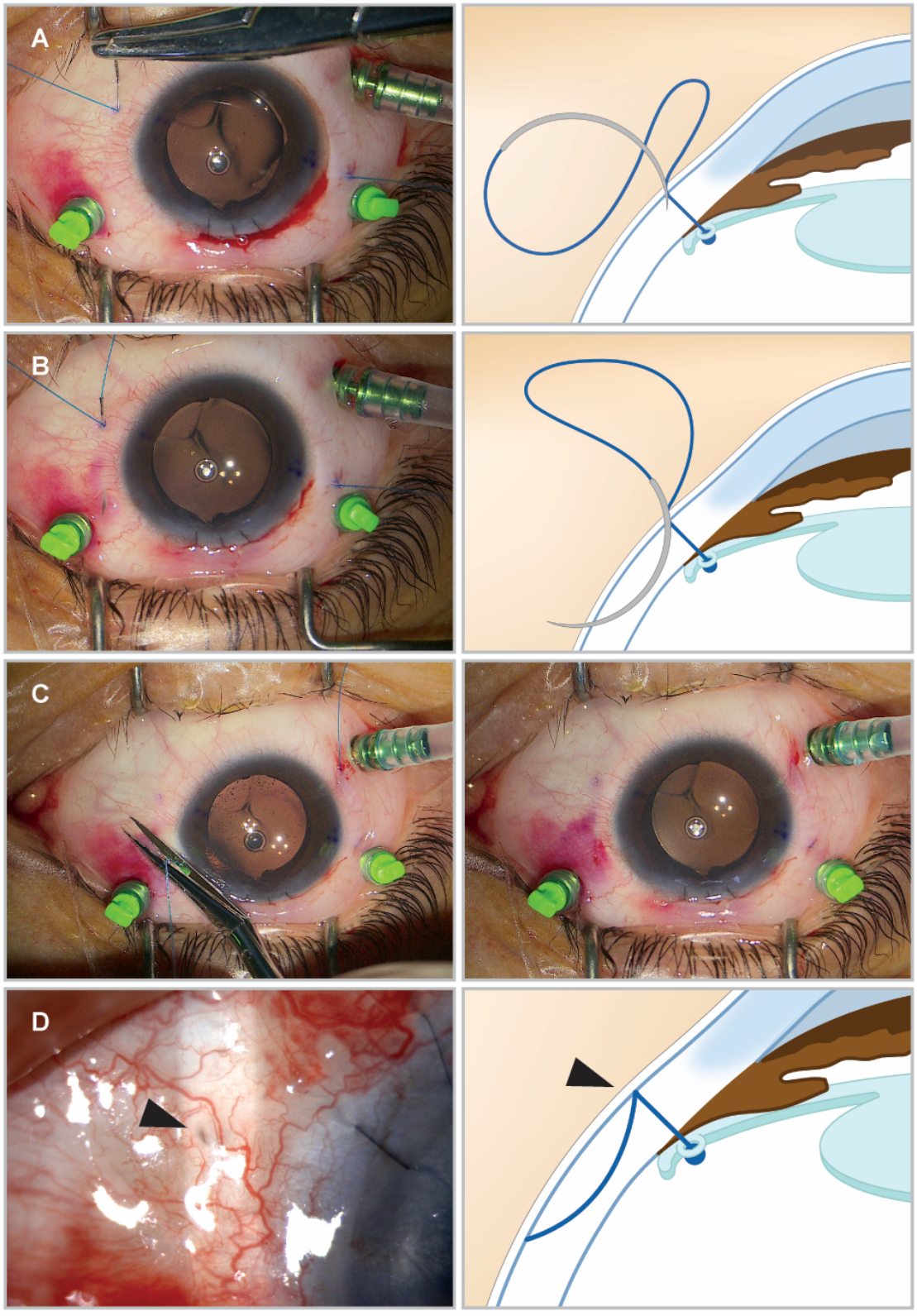
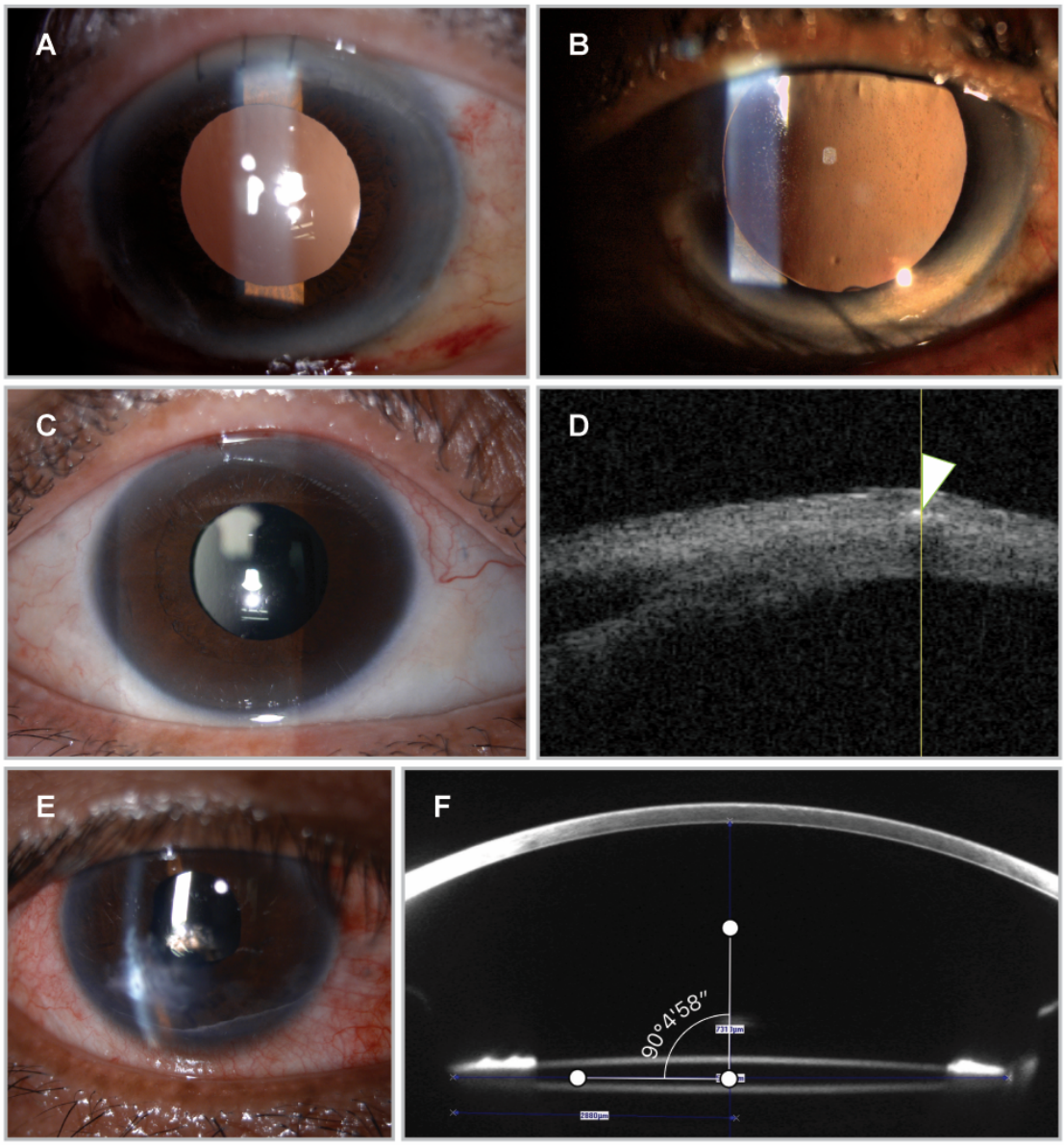


The relay-sutured intraocular lens fixation technique.



Postoperative images from different patients in the relay-sutured group.

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Axial Instability of the Zeiss CT Lucia 602 Intraocular Lens With Transconjunctival Intrascleral Haptic Fixation

- Yang (Alice) Zhang, MD CM
- Murtaza Adam, MD
- Jeff Tan
- Dipen Kumar
- Chirag Shah, MD, MPH
- Neepa Shah
- Inna Stroh
- David Crandall
- Edward Wood, MD, FASRS
- Yingna Liu, MD
- Amy Yuan, MD
- Rishi Gupta
- Zachary Kroeger, MD, MS
- Merina Thomas
- David Ehmann, BSc, MD, FRCSC, ABO
- Mark Walsh, MD, PhD
- Brenna Bullock, MD
- Vincent Ho, MD
- Lawrence Ho, MD

Objective: To examine characteristics leading to significant intraoperative or postoperative tilt with intrascleral haptic fixation (ISHF) of the Zeiss CT Lucia 602 intraocular lens (IOL).
Purpose: To report clinical features, management, and visual outcomes following observed lens tilt of the Zeiss CT Lucia 602 IOL with ISHF.
Methods: A retrospective, multi-center, observational case series of 27 patients who underwent ISHF with the CT Lucia 602 IOL was performed between May 2021 and October 2022. Haptic fixation was achieved via thermal cautery to create terminal haptic flanges. Surgical indication, technique for haptic externalization (needle-assisted versus trocar-assisted), need for vitrectomy, visual acuity, timeline for observed IOL tilt, estimated degree of tilt from iris plane, status of the haptic-optic junction, axial length, and white-to-white measurements were analyzed.
Results: A total of 31 cases (mean age 70.23) of 27 eyes were included with 9 cases of intraoperative tilt and 22 cases of postoperative tilt. Physician experience with the procedure prior to experiencing tilt ranged from 22 to 256 cases with an overall incidence rate of 3.3%. The mean angle of IOL tilt was 66.7 ± 25.8 degrees. Mean axial length was 24.2 ± 1.29 mm and mean white-to-white was 12.0 ± 0.6 mm respectively. Most cases were needle-assisted with either a TSK 30 gauge (N=13) or 27 gauge (N=11) compared to trocar-assisted (N =3) or a combination of trocar and needle-assisted (N=4). In 6 cases, the IOL had a normal haptic optic junction. In 22 cases, the haptic was either separated from the optic (N=5), warped immediately proximal to the optic junction (N=6), or rotated within the junction (N=12). Of the 22 cases of postoperative tilt, 2 cases were noted on the day of surgery, 17 cases were noted on postoperative day 1 (POD1), 2 cases were noted on postoperative week 1 (POW1), and 1 case was noted postoperative 1 month (POM1). Among the cases with intraoperative tilt, a new CT Lucia lens was placed (N=4), refixation was done using the same lens (N=1), a different lens was used (N=1), an Akreos lens was sutured (N=1), the eye was left aphakic (N=1), or the haptic ends were sutured to the sclera to correct observed tilt (N=1). Among the cases that required re-operation, 16 lenses were explanted and replaced with a new Zeiss CT Lucia 602 (N=7), a different 3-piece IOL (N=5), an Akreos lens using Goretex sutures (N=3), or an anterior chamber lens (N=1). During the follow-up period (95.2 ± 81.7 days, range 8 – 375 days), mean preoperative best-corrected logMAR visual acuity for all patients improved from 1.39 ± 0.79 to 0.64 ± 0.69 at the most recent follow-up visit ($P<0.05$).
Conclusion: The Zeiss CT Lucia 602 IOL can be associated with significant intraoperative or postoperative tilt with ISHF. Further studies are needed to understand the mechanisms and risk factors contributing to this complication.

IRB APPROVAL No - exempt

None

Adverse events associated with dislocated intraocular lenses

- Bradley Jacobsen, MD
- Timothy Lee
- Jacob Hum
- Mohsin Ali, MD

Objective: To determine the incidence of vitreous hemorrhage, retinal tears and/or retinal detachments associated with dislocated intraocular lenses.
Purpose: Cataract surgery is one of the most commonly performed procedures throughout the world and even though surgery is a safe and efficacious procedure, complications can occur including dislocated intraocular lenes (IOL). According to literature, dislocated IOLs have an incidence ranging from 0.3% to 3%. There are multiple surgical techniques to treat dislocated IOLs, however, the patient may not be perturbed with the poor visual acuity following a dislocated IOL and choose to not undergo surgery. Based on this, the dislocated IOL may be left in the affected eye. This begs the question: does the retention of dislocated IOLs have any associated complications such as vitreous hemorrhage, retinal tear and/or retinal detachment.
Methods: We performed a retrospective study using the Retina Group of Washington electronic medical records database. We identified patients who had a diagnosis of a dislocated IOL using the ICD10 codes T85.22XA, T85.22XD, T85.22XS, H27.10, H27.111, H27.121, H27.131, H27.112, H27.122 and H27.132. We then performed a chart review and identified those patients that also had a diagnosis of a vitreous hemorrhage (VH), retinal tear (RT) and/or retinal detachment (RD). We documented whether or not the dislocated IOL was repaired and the temporal association of the dislocated IOL with the VH, RT and/or RD. We excluded those patients that had a dislocated phakic lens.
Results: 1273 patients were included in this study. Overall, 779 (61.2%) were male, and 494 (38.8%) were female. 963 (75.7%) patients had no record of a previous vitrectomy whereas 310 patients (24.3%) had undergone vitrectomy surgery. 124 patients had the type (1-piece vs 3-piece) of dislocated lens recorded. 53 (42.7%) were single-piece lenses, and 71 (57.3%) were three-piece lenses. The average age was 70±14.5 years. Of the 1273 patients, 839 (65.9%) elected to have the dislocated lens replaced and 434 (34.1%) did not. Chi-Square tests were performed to assess the relationship between adverse events (VH, RT, RD) and lens type. When stratified by lens type, there was no significant difference, $\chi 2(1, N = 124) = 0.196$, $p = 0.658$. When stratified by status of IOL repair, there was a significant relationship, $\chi 2(1, N = 1273) = 5.974$, $p = 0.015$. Adverse events (VH, RT, RD) were more associated with having the dislocated IOL repaired.
Conclusion: Overall, our study revealed that there was a significant relationship between the incidence of adverse events with the repair status of dislocated IOLs. There were more adverse events reported for patients who underwent repair for a dislocated IOL. Further analysis is needed to determine the following: whether the lens was dislcoated into the vitreous or just sublexed within the bag and the temporal assocation of the IOL repair in relation to the adverse event. Our study will help guide future counseling with patients who have a dislcoated IOL when discussing risks, benefits and alternatives of IOL repair.

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