Chapter 18
Iris Repair (Iridoplasty) Using the Siepser Sliding Knot

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Abstract The patient should be fully informed of the various options available for the repair of iris defects: coloboma, cycloplegia, and traumatic deformation of the iris. A review of the potential for multiple surgeries is to be presented due to the possible need for progressive iris stretch and the alternative of an artificial iris placement. Discussion regarding a detailed history of disability and interference with the activities of daily living is warranted, as is a descriptive comment about any glare disability, visual handicap and light intolerance. Chronicle these conversations along with proper photographic documentation. The patient, any caregivers or decision-makers, and stakeholders in the surgical outcome should participate in the counseling process.

Keywords Iris repair • Iridoplasty • Siepser sliding knot • Iris defects • Iris dialysis • Trauma • Anterior segment

Indications

Iris defects, iris disinsertion, iridectomies, traumatic distortion of the normal iris anatomy, cycloplegia, and ectopic pupil

Essential Steps

1. Careful inspection and iris comparison to normal eye before dilation.
2. Pupil reactivity and position in normal eye.
3. Topical anesthetic, NSAIDS, and antibiotic drops.
4. Decision regarding need for retrobulbar block, dilation.
5. Dilation if combined with more posterior surgery, cataract, exchange of IOL, removal of adhesions, and residual debris.
6. Careful positioning of the head to allow various entrance and exit ports.
7. Care to make sure the proper working distances determined by objective lens on microscope (remove any unneeded attachments (ORA)).

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8. Marking of the various meridians for proper approach to defects.
9. Clear corneal 1 mm incisions for introduction and exit of suture needles.
10. Preservative-free intracameral xylocaine.
11. Viscoelastic dissection and visco-positioning of target tissue.
12. Lysis of adhesions, iris grabber, and sinskey hook, hand over hand.
13. *Vitrectomy and luminary probe use as needed.*
14. Identification of the iris collarette and ruff.
15. Needle is introduced and passed down through the proximal edge of the defect, sometimes a cannula can be used to fish mouth the paracentesis to aid passage of the needle into the eye without getting hung up on cornea.
16. Needle passed up through the distal edge of the defect.
17. Needle engaged into the tip of a 25 gauge cannula on viscoelastic and backed out through the distal paracentesis.
18. Condon snare introduced and passed to the distal iris suture and drawn across the defect and out of the eye.
19. Double throw performed.
20. The other side of the incision suture is then placed under tension and used to slip the knot back into the eye over the defect then tightened.
21. Visco-positioning can be repeated to ease needle passage.
22. Two-handed irrigation for removal of blood and pressure tamponade.
23. Step 16–18 repeated to lock the suture knot in position over the defect.
24. Multiple approaches and sutures are needed to close defects and position the iris.
25. Two-handed viscoelastic removal for iris positioning and check.
26. Intracameral Miochol and Miostat to constrict and place tension on the iris.
27. The use of iris traction with iris forceps to center the pupil.
28. The use of iris radial sutures to adjust the pupil centration.
29. The use of a vitrector to remove iris tags and for better sizing and centration.
30. Intracameral Tri-Moxi.
31. Stromal hydration.
32. “Sieps” Betadine test until complete wound closure is assured.
33. Patch and shield if retrobulbar was needed/no patch or shield if topical only.

Complications

– Hyphema
– Iris dialysis
– Residual iris tags
– Anomalous iris positioning
– Miosis
– Endothelial damage
– Corneal edema
– Cystoid macular edema (CME)
– Retinal detachment
– Dysphotopsias
– Anisoconia

– Anisometropia
– Astigmatism
– Endophthalmitis

Template Operative Dictation

Preoperative diagnosis: Iris coloboma (*OD/OS*), *iridocapsular adhesions*, *iris incarceration*, or *traumatic cycloplegia*

Procedure: Iridoplasty, lysis of adhesions (iridocapsular, wound revision), and repair of dialysis (*OD/OS*)

Postoperative diagnosis: *Same*

Indication: This is a ____-year-old (*male/female*) who was found to have poor vision and (*glare/disability/anisocoria/pupillary ectopia/light intolerance*) interfering with his/her activities of daily living. Astigmatism (*was/was not*) found to be present. After a fully informed consent covering extensive review of the risks and possible benefits, the patient (and/or caregiver) elected to undergo the procedure.

Description of the procedure: The patient was asked to spell their last name and give their birth date. (*He/she*) pointed to the operative site, and the *(right/left)* eye was marked with the surgeon's initials using an indelible skin marker. Topical anesthesia, NSAID, antibiotic, and mydriatic (as indicated) drops were placed into the *(right/left)* eye. The patient was then brought to the operative theater. The (*Zeiss, Leica, etc.*) operating microscope and microsurgical technique were used throughout the procedure. A thorough review of the procedure steps and needed equipment was done with the OR team.

All OR personnel's attention was directed to the patient, who was asked to spell their last name, state their birth date, verify allergies, and the procedure and site prior to the use of any anesthesia or analgesia. The use of cautery, oxygen, and fire safety procedures was verified. The checklist of needed equipment for the case was reviewed prior to intervening. A modified van Lint block was given with a 1.5 in. *25 gauge* needle. A *23 gauge* blunt retrobulbar needle was used for akinesia and bulbar anesthesia and 5 min of consistent ocular pressure was applied using a "super pinky." Topical anesthesia, 0.5 % tetracaine, was instilled twice into the conjunctival fornices of the *(right/left)* eye. A drop of 5 % Betadine was placed directly on the eye and fornices, and then copiously irrigated. The *(right/left)* eye was prepped and draped in the usual sterile fashion. The operating microscope was centered over the *(right/left)* eye, and the Lieberman rigid speculum was placed.

The various approaches to the iris defect(s) were marked with a skin marker. The needed incisions were made with *_1_*mm (*15°*) blade. Intracameral *methylparaben-free xylocaine* was injected into the anterior chamber to increase patient comfort. Viscoelastic was injected to position the iris defects for further viscodissection. A sinskey hook and iris spatula were used to perform bondage, define the limits of the

adhesions, and position the iris defects. The areas of iris retractions were unfurled and stretched using a sinskey hook and an iris grabber.

If vitrectomy was performed*—An anterior chamber maintainer was placed, the Siepser luminary probe (Escalon-Trek) was introduced to better illuminate residual membranes and vitreous using the Tyndall effect with the microscope light turned off. The vitrectomy handpiece was then introduced to remove all unwanted vitreous and membranes. DORC pediatric silicone-cuffed lenses modified to accommodate the tri-positioned probes to better visualize the anterior segment structures and remove all anterior vitreous.*

Areas of iris retraction were stretched taught and aligned for positional sense. The two-handed I/A handpieces were used to remove any hemorrhage, coagulum, and debris from the anterior chamber. Additional viscoelastic was placed to allow for a clear unobstructed view of the details of the anterior chamber.

A ten polypropylene CIF-4 needle was introduced through the paracentesis using a cannula to fish mouth the incision for easier passage. An iris grasper held the proximal iris while the needle was passed through the iris collarette on the proximal side. The distal iris was then stabilized, and the needle was passed through the matching area of the distal iris collarette docked into the blunt cannula and withdrawn with a following motion to present outside the eye. The Condon snare was then passed across the anterior chamber to loop out the distal end of the suture and pulled through the paracentesis. A double throw knot was then formed outside the eye using the Siepser sliding knot which was then drawn back into the eye over the defect and using tension from the opposite side, cinched tight into the appropriate position. The distal suture was then snared and brought out of the proximal paracentesis. The knot was squared and slid over the original knot and cinched into position. Viscoelastic was used to position the sutures. An intraocular scissor was introduced from another meridian, and the suture ends were transected and removed.

Additional sutures were then passed through the iris ruff and basal areas to completely close the defect using the same technique. Material anterior and posterior to the iris leaflets, and all viscoelastic, was removed using a two-handed I/A handpiece. The iris position was verified and adjusted using intermittent viscoelastic. The iris grabber then cleared all viscoelastic using the two-handed I/A technique.

Minimal stromal hydration of the corneal incisions was needed. The Sieps Betadine test was used to affirm the corneal incision integrity and, with added hydration and testing, found to be water tight. A _*0.25*_ ml of Tri-Moxi was placed in the posterior chamber. The eyelid speculum and drape were removed. Antibiotic ointment was placed in the inferior fornix, and a shield was placed over the eye. The patient tolerated the procedure well and left the OR in satisfactory, stable condition.