

Chapter 54

Cataract Extraction with Gold Metal Shunt (GMS) Implant



Ike K. Ahmed, Matthew B. Schlenker, and Jeb Alden Ong

Indications

Glaucoma uncontrolled by medical or laser therapy, refractory glaucoma, or failure of previous glaucoma surgical intervention

Cataract extraction: attempt to further reduce IOP, cataract-causing impaired visual acuity, cataract-obscuring view to the posterior pole, and desire to prevent a second surgery in the future which may lead to glaucoma surgery failure

Essential Steps

1. Sideport incision
2. Clear corneal incision
3. Capsulorhexis
4. Hydrodissection
5. Phacoemulsification
6. Aspiration and irrigation of the cortical material
7. Capsular bag inflation with viscoelastic
8. Insertion of the IOL
9. Superior fornix-based conjunctival flap

I. K. Ahmed (✉)

Department of Surgery, Ophthalmology, Trillium Health Partners, Mississauga, ON, Canada

M. B. Schlenker

Department of Ophthalmology and Vision Sciences, Trillium Health Partners, Kensington Eye Institute, University of Toronto, Toronto, ON, Canada

J. A. Ong

Department of Ophthalmology, Credit Valley Hospital, Mississauga, ON, Canada

10. 95% depth scleral incision
11. Scleral pocket
12. Paracentesis incision
13. Injection of viscoelastic
14. Scleral incision made full thickness until choroid visualized
15. Lidocaine and viscoelastic injection into the suprachoroidal space
16. Anterior chamber entered at the level of the scleral spur
17. Insertion of suprachoroidal shunt
18. Confirmation of placement with intraoperative gonioscopy
19. Closure of scleral wound
20. Closure of conjunctiva

Complications

- Hyphema
- Vitreous hemorrhage
- Suprachoroidal hemorrhage
- Thin fibrotic membrane obstructing proximal and distal holes
- Corneal edema
- Elevated IOP
- Hypotony
- Small bleb formation
- Uveitis
- Endophthalmitis
- Cystoid macular edema (CME)
- Retinal detachment
- Traumatic injury to the iris
- Choroidal detachment
- Lens dislocation
- Dropped lens
- Retained nuclear or cortical material
- Capsular tear
- Zonular dehiscence
- Dysphotopsias
- Ptosis

Template Operative Dictation

Preoperative diagnosis: *Uncontrolled glaucoma and cataract (OD/OS)*

Procedure: Gold metal suprachoroidal shunt implant and cataract extraction (*OD/OS*)

Postoperative diagnosis: *Same*

Indication: This ___-year-old *male/female* with a well-known and documented history of glaucoma has had elevated IOP despite maximal tolerated medical \pm laser therapy \pm failed surgical therapy. The patient's IOP has been as high as ___ mmHg, \pm and the patient has had glaucoma progression. *He/she* also had a (*nuclear/cortical/posterior sub capsular*) (*Lens Opacities Classification System III/Wisconsin Grading/Oxford Clinical Cataract Classification*) grade ___ cataract. (*If no cataract present, a clear lens extraction was elected.*) After a detailed review of risks and benefits, the patient was elected to undergo the procedure.

Description of the procedure: The patient was identified in the holding area, and the (*right/left*) eye was marked with a marking pen. The patient was brought into the OR on an eye stretcher in the supine position. Tetracaine drops were instilled into the eye. Mild analgesia and sedation were induced using MAC. The (*right/left*) eye was prepped and draped in the usual sterile fashion. The operating microscope was centered over the (*right/left*) eye and an eyelid speculum was placed in the eye. A proper time-out was performed verifying correct patient, procedure, site, positioning, and special equipment prior to starting the case.

Attention was first turned to the cataract. An Ahmed SuperPentiAhm trifaceted mini-diamond knife or 15-degree blade (actually lots of options) was used to make a sideport incision followed by injection of Xylocaine, Viscoat, and Provisc (soft-shell technique) into the anterior chamber. Using a ___ mm keratome blade, a ___ mm temporal clear corneal incision was made.

If trypan blue dye used:

- **Technique 1:** *Small amounts of trypan blue were injected over the anterior capsule and painted over the anterior capsule surface until an adequate staining was achieved after the Viscoelastic had been injected into the anterior chamber.*
- **Technique 2:** *Trypan blue was injected into the anterior chamber through a sideport incision and used to stain the lens anterior capsule. Following this an air syringe was used to inject an air bubble into the anterior chamber. Following approximately ___ seconds, balanced salt solution was injected through the paracentesis wound to clear away excess Trypan blue and expose the stained anterior lens capsule.*

The capsulorhexis was completed using Utrata forceps followed by hydrodissection with balanced saline solution on a Chang cannula. Phacoemulsification was then performed using a phaco-chop technique. Irrigation and aspiration were used to remove remaining cortical material, and the capsular bag was reinflated with Provisc. A total _____ absolute phaco-time (APT) was used in the procedure. An intraocular lens, (*Alcon/AcrySof/Tecnis*) model #_____, serial #_____, with a power of _____ diopters, was inspected and found to be defect-free. The IOL was injected into the capsular bag using a Monarch injector and dialed into proper position using a Kuglen hook.

The operating microscope was then rotated superiorly into position, and a superior fornix-based conjunctival flap was created by making an initial ___ mm

peritomy, approximately ____mm from the limbus. Subconjunctival Xylocaine was then infiltrated in the subconjunctival space to augment topical anesthesia. Blunt dissection to mobilize the conjunctiva was then carried out using Westcott scissors. Hemostasis was achieved with bipolar electrocautery. A mini-diamond blade was used to create a 95% depth scleral incision approximately ____mm from the limbus and ____mm in length. A scleral pocket was then dissected anteriorly toward the clear cornea.

A paracentesis incision was used to lower the intraocular pressure, and additional Provisc was injected into the anticipated entry site of the suprachoroidal shunt. The previously created vertical scleral incision was then extended full thickness until choroid was visualized. 1% non-preserved lidocaine and Provisc were then injected into the suprachoroidal space. The Zaldivar anterior procedure (ZAP) diamond knife was used to enter the anterior chamber at the level of the scleral spur. The anterior aspect of the SOLX gold suprachoroidal microshunt was inserted into the scleral tunnel using curved tying forceps. The shunt was advanced into the anterior chamber, while a 27-gauge needle was used to place the posterior edge into the suprachoroidal space. A Sinskey hook was used in the anterior chamber to ensure that the shunt was placed sufficiently posterior to ensure that the posterior orifices of the shunt rested in the suprachoroidal space. An intraoperative gonioscopy lens was used to assess and ensure proper positioning of the shunt in the anterior chamber.

The scleral wound was then reapproximated using # interrupted 10-0 nylon sutures. The conjunctiva was then closed using 10-0 Vicryl in a running horizontal mattress fashion. At the conclusion of the case, the patient received Maxitrol ointment. The patient was then transferred to the recovery room in stable condition, and (he/she) tolerated the procedure well.

Additional Resource

<http://eyetu.be/swisa>; <https://www.youtube.com/watch?v=rNOTZx-ZY4Q>.