

# Chapter 26

## Cataract Extraction with Gold Metal Shunt (GMS) Implant

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**Abstract** Surgical management of cataract patients with uncontrolled glaucoma poses several challenges to the ophthalmologist. With the goal of improving visual acuity and optimizing intraocular pressure, the ophthalmologist may choose to combine cataract extraction with glaucoma surgery in one operative encounter. Suprachoroidal procedures obviate the need to utilize the conjunctiva to create filtering blebs (i.e., trabeculectomies) and reduce the risk of failure of bleb-related surgery secondary to bleb-related fibrosis, scarring, infection, or overfiltration. The gold metal shunt implant takes advantage of the natural negative pressure gradient from the anterior chamber into the suprachoroidal space, while still providing natural counterpressure to prevent hypotony.

**Keywords** Cataract extraction • IOL • Uncontrolled glaucoma • Gold metal shunt implant • SOLX gold microshunt

### 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

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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
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 side port 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 side port 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.