Management of Choroidal Detachment and Shallow Anterior Chamber

Parul Ichhpujani, Suresh Kumar Gupta, Sunandan Sood
Department of Ophthalmology, Government Medical College and Hospital, Chandigarh, India

Correspondence: Parul Ichhpujani, Assistant Professor, Department of Ophthalmology, Government Medical College and Hospital, Chandigarh, India, e-mail: parul77@rediffmail.com

ABSTRACT

Shallow anterior chamber and choroidal detachment are common complications after trabeculectomy. This review highlights the clinical course and management options for various scenarios which can lead to shallow anterior chamber.

Keywords: Choroidal detachment, Choroidal hemorrhage, Glaucoma filtering surgery, Shallow anterior chamber.

SHALLOW ANTERIOR CHAMBER POSTGLAUCOMA SURGERY

A shallow or flat anterior chamber (FAC) is common in early postoperative period, especially in patients with preoperative shallow chambers.1,2 The reported incidence of FAC after trabeculectomy varies widely from 2 to 41%.2,3

Possibilities

a. Excessive outflow of aqueous humor, or
b. Decreased formation of aqueous humor, or
c. Both a and b.

Spaeth’s Classification of Flat Anterior Chamber (Fig. 1)

Grade I: Peripheral—iris apposition
Grade II: Pupillary border—corneal apposition
Grade III: Lens—corneal touch.

CLINICAL PRESENTATIONS

A. Negative Seidel test with grade I or II flat anterior chamber and low intraocular pressure (Fig. 2).

Management

• Resolves spontaneously in 1 to 2 weeks
• Conservative: Topical steroids and long acting cycloplegics; in order to reduce inflammation and stabilize the blood aqueous barrier4
• Restriction in activity (bending, weightlifting)
• Avoid Valsalva positive conditions, especially patients at risk for suprachoroidal hemorrhage
• Focal compression of filtration site with a pressure patch can decrease aqueous outflow and can promote chamber reformation.

B. Positive Seidel test with grade I flat anterior chamber and low intraocular pressure:

• Small leaks around sutures
### Management

- Observe, small leaking tracts close without treatment
- Increase the frequency of topical antibiotic to prevent infection
- **Brisk leaks**: Pressure patching or therapeutic contact lens. Patient should be monitored on a daily basis.
  - Fibrin tissue glue\(^5,6\) (Fig. 3) or cyanoacrylate glue can be used to close an early wound leak. Glue is used over dry conjunctival surface and a bandage contact lens can prevent it from getting dislodged due to lid movement (Fig. 4). In order to avoid risk of infection due to fibrin adhesive derived from pooled plasma, autologous fibrin adhesive may be derived from patient’s own blood.
  - Simmons shell\(^7\) has been used by some physicians, but the patients have to be monitored daily for signs of infection and ocular surface abnormalities.

C. **Positive Seidel test**, low bleb height with grade II or III flat anterior chamber and low intraocular pressure:
- Conjunctival button holes or wicks of extruding Tenon’s capsule from the conjunctival incision
- Associated with high risk of bleb failure, corneal edema and cataract.

### Management

- **Reformation of the anterior chamber**: Intraocular injection of air, balanced salt solution (BSS) or viscoelastics. Sodium hyaluronate (Healon) injection through the paracentesis tract is commonly done.\(^1,7\) Monitor both the depth of the chamber and the pressure of the globe (with a finger) as BSS or a viscoelastic is injected (Table 1)
- **Dehiscence of the incision of conjunctival flap** (Fig. 5): Surgical repair
- **Conjunctival tear**: Depends on whether conjunctiva is healthy or fragile.

**Healthy conjunctiva**: Purse string suture with 10-0 nylon with a noncutting, round, tapered needle.\(^1\)

**Fragile conjunctiva**: Do not attempt purse string suture, it may worsen the situation.

Try pressure patch or 20 to 22 mm bandage contact lens for a few days, as it allows for conjunctival surface re-epithelization.

### Table 1: Possible outcomes after chamber reformation with BSS or viscoelastic

<table>
<thead>
<tr>
<th>IOP</th>
<th>Chamber depth</th>
<th>Bleb height</th>
<th>Possible cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Shallow (forms and collapses)</td>
<td>Increases</td>
<td>Excessive filtration</td>
</tr>
<tr>
<td>Low</td>
<td>Shallow</td>
<td>Remains shallow</td>
<td>Aqueous misdirection or cyclodialysis cleft</td>
</tr>
<tr>
<td>Rises</td>
<td>Deep</td>
<td>Remains shallow</td>
<td>Aqueous hyposecretion with occluded fistula</td>
</tr>
<tr>
<td>Low</td>
<td>Deep</td>
<td>Increases</td>
<td>Aqueous hyposecretion with patent fistula</td>
</tr>
</tbody>
</table>

Fig. 3: Tisseel fibrin glue

Fig. 4: Bandage contact lens prevents conjunctival epithelial disruption due to repeated lid excursion

Fig. 5: Conjunctival incision dehiscence with positive Seidel test
Aqueous Misdirection

- Predisposing factors include patients with angle closure glaucoma (postfiltration surgery incidence of aqueous misdirection being 2-4%), hyperopia or nanophthalmos
- Rule out pupillary block (aqueous misdirection is seen in presence of a patent iridectomy) (Fig. 6).

Management

- Initial medical management with cycloplegic-mydratic agents, such as atropine 1% and phenylephrine 2.5% (to relax the ciliary muscle, pull iris-lens diaphragm posteriorly and deepen the central chamber) and an osmotic agent (20% intravenous mannitol 1-2 mg/kg over 30 minutes)9
- Aqueous secretion should be suppressed with beta blockers or carbonic anhydrase inhibitors. Miotics are contraindicated
- In cases unresponsive to medical therapy, anterior hyaloidotomy in pseudophakic or aphakic patients and pars plana vitrectomy in phakic patients can be considered.10,11
- The most common method involves Nd:YAG laser photodisruption of the anterior vitreous face through an iridectomy or iridotomy hole or through the pupil
- Lens extraction12 and intraoperative capsulotomy13 can be considered, if vitrectomy alone fails to reverse the condition
- Cycloidiode photocoagulation may also be done in refractory cases.14

Suprachoroidal Hemorrhage

- Seen in first postoperative week and is usually associated with postoperative hypotony.15,16
- The mechanism may involve traction on a posterior ciliary artery associated with anterior displacement of the lens-iris diaphragm and, in turn, the retina and choroid
- Sudden onset of severe pain and deterioration of acuity is the hallmark presentation. Fundus examination shows detached dark red-brown choroidal elevation.17
- The risk of SCH has been reported to be higher in patients with high myopia, aphakia or pseudophakia, prior vitrectomy, bleeding disorders and systemic hypertension.18
- Early lysis of scleral flap sutures may produce hypotony and should be avoided in the immediate postoperative period in eyes at high risk
- The functional and anatomic results of postsurgical suprachoroidal hemorrhages are still poor, even though the prognosis seems to have improved.

Management

- Drainage is more effective when the clot liquefies, typically after 7 to 10 days. If there are no signs of resolution at this juncture and the effusion is large, drainage might be pursued19
- A standard technique for drainage of choroidals includes simultaneous anterior segment infusion of balanced salt combined with a full-thickness radial sclerotomy 3 or 4 mm posterior to the limbus, ideally over the meridian of the highest choroidal effusion. Usually two separate quadrants (commonly diametrically posed) are placed19,20
- Vitrectomy is typically reserved only, if there is vitreous incarceration in the anterior segment wound. Scleral buckling is done, if there is true rhegmatogenous retinal detachment or unresolvable peripheral vitreoretinal traction
- Trabeculectomy techniques should be modified in eyes at high risk. For example, as eyes with reduced structural rigidity (e.g. prior vitrectomy) are at increased risk for choroidal hemorrhage, one should avoid creating a large sclerostomy, small scleral flap and loose scleral flap sutures with rapid aqueous egress.

Choroidal Detachment

- Choroidal detachments due to serous effusions in the suprachoroidal space are a frequent occurrence after glaucoma filtering or tube shunt surgery, especially in association with hypotony (Fig. 7)21
- Predisposing factors: Hyperopia, ocular inflammation, systemic hypertension, atherosclerosis, aqueous suppressant therapy22
- With the use of adjunctive antimetabolites during trabeculectomy, prolonged hypotony may lead to prolonged or persistent choroidal detachments.

Clinical Scenario

- Low intraocular pressure (usually < 6 mm Hg, below episcleral venous pressure), shallow peripheral anterior chamber
- Fundus examination reveals a dome-shaped elevation of the retinochoroid that is acoustically hollow on B scan
 ultrasonography (Figs 8A and B). Ultrasonography helps to evaluate the presence, extent and location of choroidal detachment.

**Management**

**Mild to Moderate Choroidal Detachment**
- Well tolerated with spontaneous resolution in most cases, as intraocular pressure increases
- Medical management includes frequent topical steroids and cycloplegics as atropine 1%. Systemic steroids may be needed in some cases
- Systemic and topical aqueous suppressants in the fellow eye should be discontinued.

**Massive Choroidal Detachment with Prolonged Retinal Apposition at the Posterior Pole (Kissing Choroidals)**
- **Surgical drainage:** Sclerostomy is performed in one or both inferior quadrants and a tangential incision is performed in the sclera 4 mm posterior to the limbus
- A deep anterior chamber can be maintained by an infusion line connected to an anterior chamber maintainer through the paracentesis (Fig. 8)23,24
- In some cases, reformation of anterior chamber with sodium hyaluronate can transiently elevate the intraocular pressure, which can decrease the effusion, stimulate aqueous secretion and break the vicious cycle of ciliary shutdown-choroidal effusion.

**Key Tips**
- Treatment should aim at stabilizing the inflow of aqueous and outflow through the fistula
- Immediate intervention is required for grade III shallow chambers while grade I or II can be managed conservatively in the absence of a brisk wound leak
- Serous choroidal detachment is usually self resolving while hemorrhagic choroidal detachment needs surgical evacuation after clot lyses.

**REFERENCES**