

THE SHALLOW AND FLAT ANTERIOR CHAMBER



Eye Learn

All about the Eye

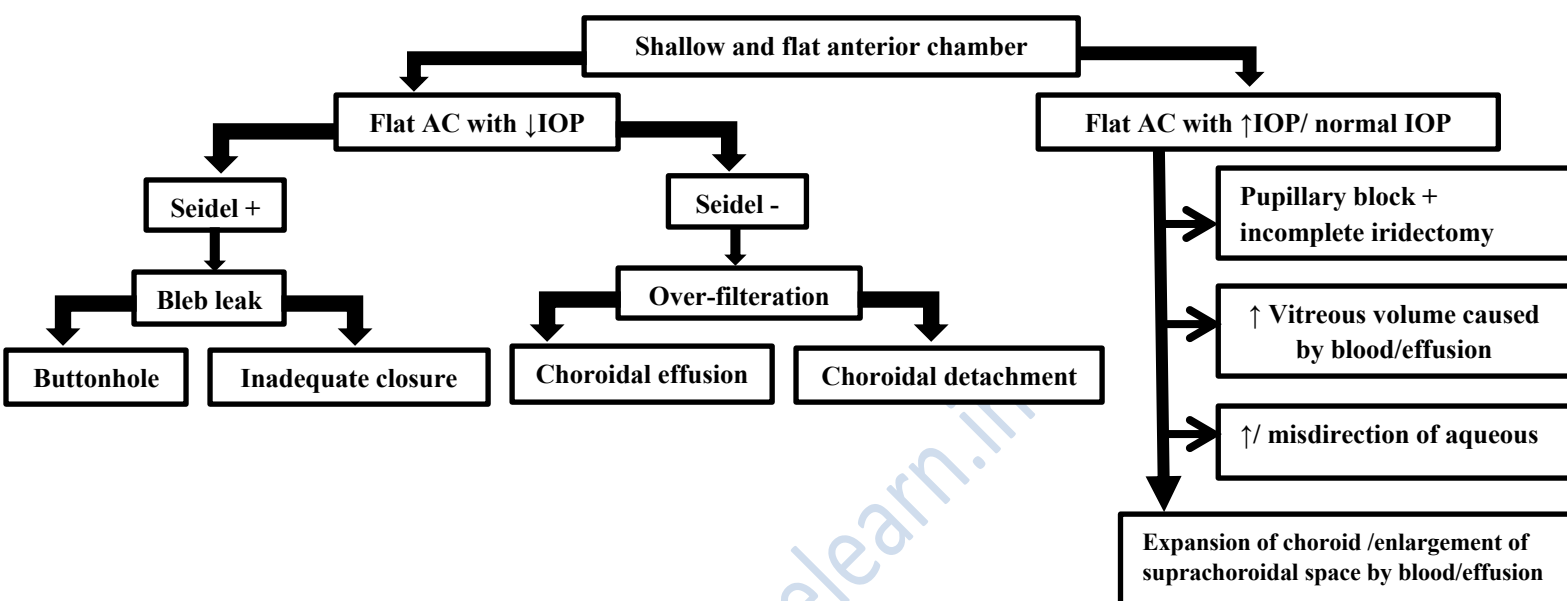
Dr. Krati Gupta

Dr. Saurabh Deshmukh

www.eyelearn.in

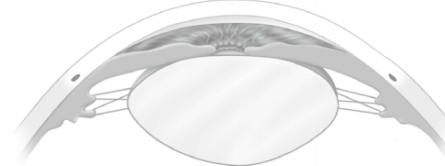
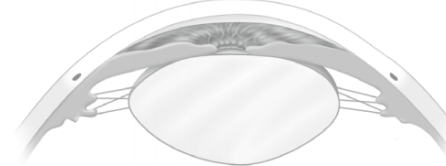

The shallow and flat anterior chamber

1. Diagnosis and management of a case of shallow anterior chamber on the first postoperative day following trabeculectomy. (5+5) J2015
2. a) Etiopathogenesis of flat anterior chamber after glaucoma surgery. b) How would you critically evaluate and manage such a case? 5+5 J2017
3. Discuss the differential diagnosis and management of shallow anterior chamber in first postoperative day after trabeculectomy. (J2012)



The depth of the chamber and the extent of the bleb will depend on several factors,

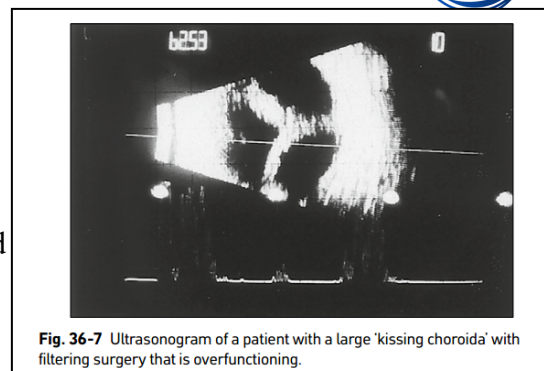
1. Whether a full-thickness or guarded procedure (trabeculectomy) was performed,
2. The tightness of the scleral flap,
3. The firmness of the eyepatch,
4. The use of antimetabolites at the time of the surgery,
5. Use of intracameral viscoelastics.

Spaeth Grade 1	Spaeth Grade 2	Spaeth Grade 3
Peripherally flat, with peripheral iris and cornea touching but with preservation of AC in front of the pupillary space.	Greater apposition between the mid iris and the cornea, but some space between anterior surface of the lens (or vitreous) and cornea in the pupillary region is retained	AC is truly flat, with complete contact of the iris and the pupillary space with the posterior surface of the cornea
May reverse spontaneously	May reverse spontaneously	Medical emergency
		



Flat anterior chamber with hypotony

- Immediate postoperative hypotony is often accompanied by **choroidal effusions/detachment**.
- Such effusions can appear as either a low, annular detachment appreciated only because ease with which ora serrata is visualized
- Or as large choroidal effusions that may compromise the visual axis when 2 detachments 'kiss' in the midvitreal cavity



Treatment

- If effusions are seen in the absence of a conjunctival wound leak, defer any surgical intervention.
- Indications for surgery are usually reserved for
 - i. The persistence of 'kissing choroidals,' in which the retinal surfaces are in contact astride large bullous choroidal detachments.
 - ii. Or a grade 3 flat chamber with actual or potential compromise of the corneal endothelium.
- Choroidal effusions will often resolve with time, and with the use of atropine cycloplegia and steroids to reduce inflammation.
- One exceptional circumstance that often fails to respond to medications and requires early surgical intervention is an eye with CACG and an extremely shallow chamber after trabeculectomy; such circumstances predispose to aqueous misdirection (malignant glaucoma) syndrome.

Bleb leak

- A large soft contact lens, a symblepharon ring or the Simmons shell may impede aqueous flow through the sclerostomy, encourage any buttonhole to heal, and help form the chamber sooner.
- It is more likely if no intraoperative antimetabolite was used.
- In small wound dehiscence, either topical cyanoacrylate or tissue glue covered with a bandage contact lens or a compression suture can be attempted.
- The compression suture - by 9-0 nylon attached at the corneal limbus, fashioned in an X-crossing at the leak site, and anchored in episcleral tissue posterior to the edge of the bleb.
- It can remain for several weeks before removal.

If the lens or IOL is pushed against the cornea,

- Endothelium may be rapidly damaged, causing corneal decompensation (a grade 2 to grade 3)
- In flat grade 3 AC, an attempt to re-form AC at the slit lamp should be made immediately through
 - i. A paracentesis, either by air or viscoelastic injection or by intraocular gas.
 - ii. If a paracentesis opening does not exist or cannot be found, injection with a disposable 30-gauge needle passed into the anterior chamber through the cornea

If the injected material passes out of the eye through the sclerostomy site

- Commonly seen with full-thickness or hyperfiltrating trabeculectomy procedures
- Rx- drainage of the suprachoroidal fluid with or without surgical modification of the filtration site.
- For drainage,
 - i. One or more sclerostomies inferiorly are made 4mm behind the limbus and over the pars plana;
 - ii. The AC is re-formed with BSS or viscoelastic,
 - iii. And attempts are made to drain the suprachoroidal effusion while maintaining the chamber at as normal a depth as possible.

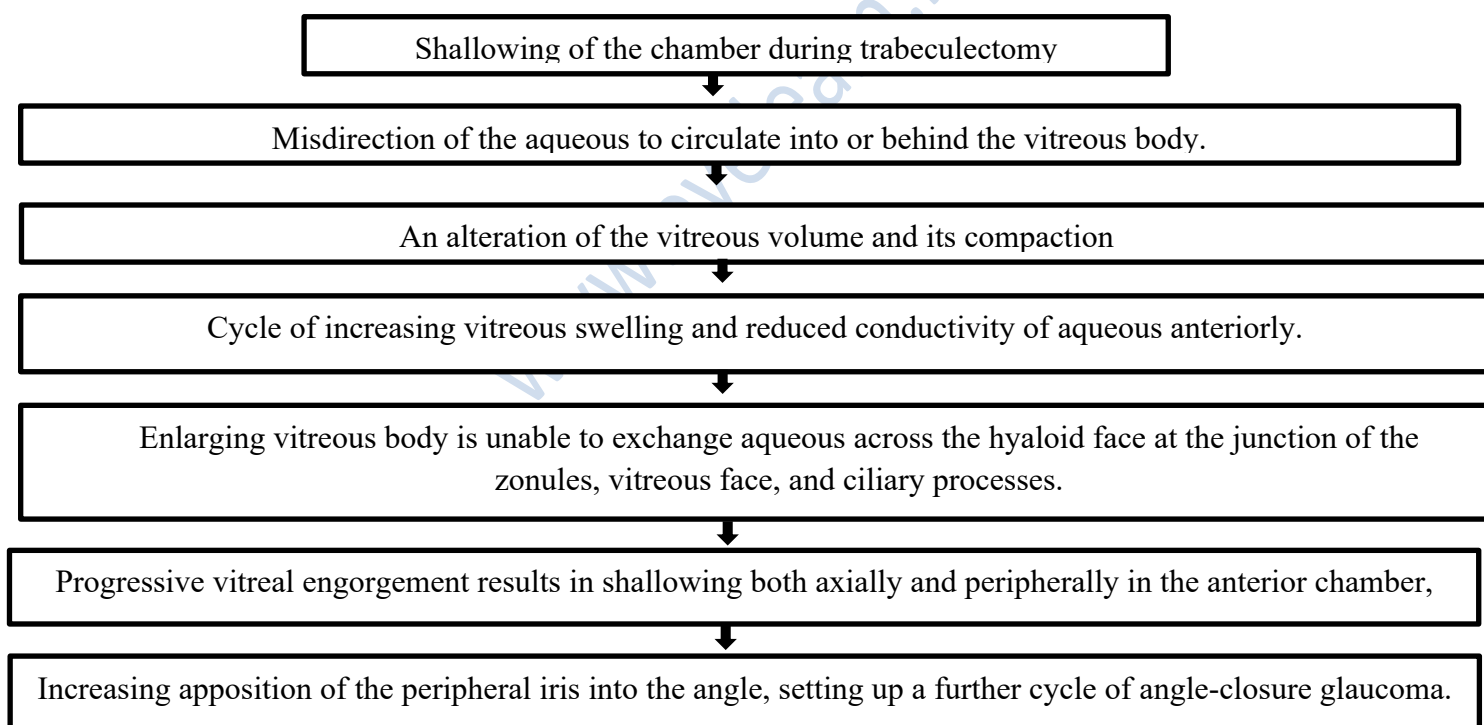
- The benefits of choroidal drainage may take several months to fully manifest
- Over three-quarters of phakic eyes developed cataracts within the first year, a complication.

Ciliary block glaucoma

- AKA aqueous misdirection, hyaloid block glaucoma and posterior aqueous entrapment) is suspected in
 - i. Presence of a grade 2 or 3 shallow chamber,
 - ii. With the prominent shallowing of the peripheral and central anterior chambers simultaneously.
- The pressure is usually higher than expected: in the early postoperative period -15 and 20mmHg despite adequate bleb; in other cases the pressure can be quite high.
- Cycloplegics can be curative of malignant glaucoma and miotics can be exacerbative
- Accumulation of fluid in the suprachoroidal space in some cases of ciliary block glaucoma, and this has been confirmed by ultrasonic biomicroscopy.
- In pseudophakic patients- referred to as iridovitreal block and retrocapsular aqueous misdirection.

Differential diagnosis - angle-closure glaucoma with ciliary choroidal detachment.

The **pathophysiologic** sequence of ciliary block glaucoma is



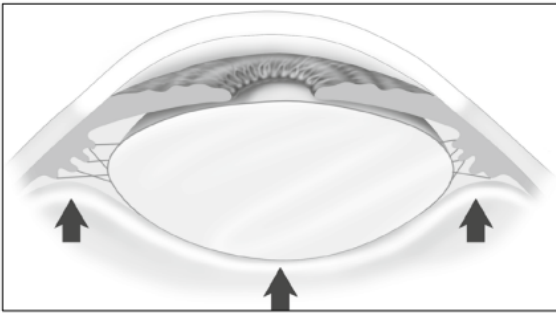
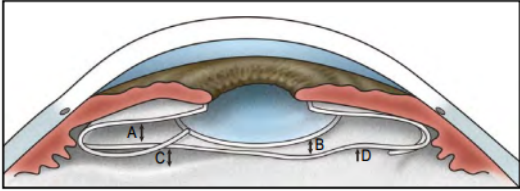
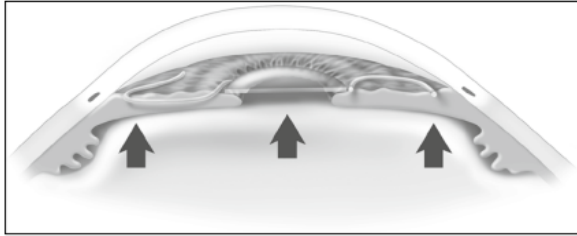
Treatment

Medical management

- Miotic medications should be discontinued
- Vigorous cycloplegia & topical steroids should be instituted.
- Other agents to reduce aqueous production, topical alpha-agonists or beta-blockers, carbonic anhydrase inhibitors, or osmotic agents, can be used to reduce the pressure.
- A waiting period of approximately 5 days has been advised with this intensive medical regimen
- 50% resolve during this interval

- Chronic atropine drops may be needed, and great attention should be paid to the fellow eye, which is at a high risk for recapitulating the events of the ifrst eye's ciliary block glaucoma attack.

Surgical intervention

Phakic eyes	Either a needle aspiration of vitreous through the pars plana or pars plana vitrectomy	 <p>Fig. 36-15 Phakic malignant glaucoma. With the sequestration of aqueous within the vitreous body, there is compression of the anterior chamber both axially and peripherally (arrows), causing central shallowing of the chamber with forward movement of the lens and peripheral angle closure.</p>
Pseudophakic eyes \pm IOL+PC	Direct incision of the hyaloid face using (Nd:YAG) laser sequentially eliminate pupillary block(iris), retrocapsular block, (posterior capsule)& hyaloid (hyaloid face).	 <p>Fig. 36-16 Capsular malignant glaucoma. In the presence of a posterior capsule with a posterior chamber intraocular lens there are multiple sites in which aqueous can be sequestered, and these sites must be sequentially eliminated: (A) aqueous pockets between the iris and anterior capsule; (B) pockets within the capsular bag and lens implant; (C) pockets between the posterior capsule and hyaloid face, and (D) aqueous trapped within the vitreous cavity behind an intact hyaloid face.</p>
Aphakia (acapsular eye)	Hyaloidectomy centrally and peripherally can be undertaken with the Nd:YAG laser or with incisional surgery Vitrectomy	 <p>Fig. 36-17 Acapsular malignant glaucoma. In the absence of a posterior capsule – such as aphakia or, as seen here, an anterior chamber intraocular lens – the abnormal vitreous forces compress the anterior chamber axially and peripherally (arrows), but the abnormal hyaloid surface is accessible to laser or incisional surgery.</p>

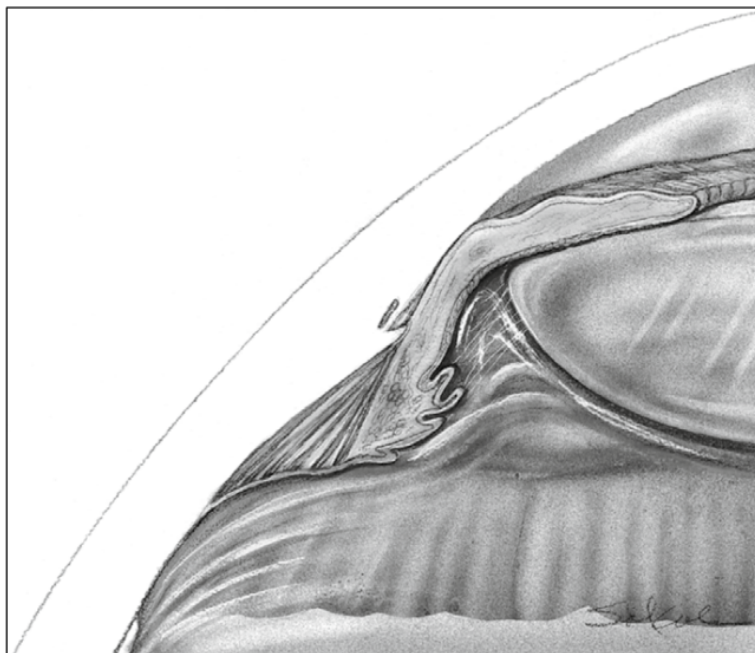


Fig. 16-3 Schematic drawing of proposed mechanism of **ciliary block glaucoma**. Thickened, less permeable vitreous face is in contact with lens, iris and ciliary body. Lens and iris are displaced forward.

Suprachoroidal hemorrhage

- After glaucoma surgery is rare.
- Can appear after virtually any glaucoma operations, \pm antimetabolites;
- Higher frequencies following glaucoma shunt procedures.
- It occurs more commonly in

Traumatized eyes Aphakia(mcc postop SCH) Vitrectomized eyes	Large eyes with pathologic myopia Large eyes with congenital glaucoma	Eyes with significant post-operative hypotony Patients taking systemic anticoagulants
---	--	--

- Relationship with IOP & axial length

Under 30mmHg	no incidence of SCH
30 and 39mmHg	6%
40–49mmHg	11%
over 50mmHg	20%
AL>25.8m	greater risk

Clinical presentation

- Severe pain accompanied by sudden loss of vision during 4th/ 5th postoperative days.
- If the hemorrhage is severe, IOP may be quite high
- Patient may have nausea and vomiting

Treatment

Medical management

- Aqueous suppressants and hyperosmotic agents

If fail to lower the IOP, the hemorrhage may require drainage.

- The goal of this surgical intervention is to allow the blood residue to escape from the suprachoroidal space while restoring the normal intraocular relationships
- Sclerotomy incision should be placed near the center of the choroidal elevation seen visually / ultrasound
- 4-5 days are necessary for a clot to lyse in the suprachoroidal space.
- If drainage can be delayed for that period of time, drainage will be more easily accomplished through a posterior sclerostomy placed directly over the area of elevated choroid.
- 2-mm sclerostomy is usually adequate to allow the escape of the xanthochromic fluid followed by the black 'sludge' of the clot.
- BSS/air/viscoelastic can be injected to re-form the AC via paracentesis opening; AC maintaining device is helpful to prevent intraoperative hypotony

If pain and IOP cannot be controlled or IOP elevation is very high

- Earlier drainage is required.
- In such cases, the clot will not have lysed, so a large scleral incision (10–12mm) is required
- The surgeon should not try to pull the clot from the wound with an instrument but rather express it with gentle pressure while gradually enlarging the sclerostomy site as needed.
- Maintenance of high-normal IOP forces more of dissolved clot out through the sclerotomy opening.
- It is helpful to inject viscoelastic into AC at the end of procedure to maximally maintain ocular integrity, and to keep IOPIN 25–35- mmHg range a few days before intervening medically.
- Every effort should be made to prevent choroidal injury, which might cause blood to get into the vitreous cavity where it promotes inflammation and scarring.

In aphakia-

- Immediate attention is warranted if choroid and retina are pushed so forward that they present in the pupillary space.
- Air/ fluid & intraocular gas have been used to push the choroid and retina back after a posterior sclerostomy has allowed evacuation of the suprachoroidal blood.

In a hypotonous eye

- With little resistance to outflow through a glaucoma filtration site, liquefied vitreous offers an insufficient tamponading effect to prevent expansion of the hemorrhage.
- Rx- More secure closure of guarding scleral flap may increase this resistance & reduce risk of hypotony.
- After a few days, when inflammation from the surgery has subsided and the conjunctiva has healed enough to offer some resistance to the aqueous outflow, the scleral flap sutures can be lasered transconjunctivally to increase the scleral opening.
- Re-formation of the chamber with a viscoelastic substance also increases the resistance to expulsion of the intraocular contents and should be considered in high-risk eyes.

Intra-operative expulsive SCH

- Is rarely seen in eyes undergoing glaucoma surgery.
- Rx- limbal incision must be closed instantly and a posterior sclerotomy performed immediately over the presumed site of bleeding to allow the blood to escape from the suprachoroidal space without causing extrusion of intraocular contents or bleeding into the vitreous cavity.
- An anterior chamber maintainer can be inserted to maintain control of IOP.
- If the hemorrhage is small, it may not be located easily and therefore will be impossible to drain.



- In the phakic eye, it will absorb enough to allow the chamber to form, usually in 1–2 days

Prognosis

Good visual recovery	Favorable	Poor
no extrusion of intraocular contents other than aqueous and liquefied vitreous if blood does not break through into the vitreous cavity if high IOP is not sustained	eyes with focal SCHs if surgical drainage is undertaken within 14 days	concomitant retinal detachment or a 360° SCH

www.eyelearn.in