17th Annual International Meeting of Research Institute of Ophthalmology (RIO)
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# Symposium 2: Keratoplasty update

## Keynote Lecture: Tectonic Keratoplasty


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Chair and Professor of Ophthalmology


RIO

The University of Nottingham

# Tectonic: Relating to structure

For any severe eye disease or injury there are two objectives:

1. Save the eye

2. Restore vision

Objective 1 takes priority – Save the eye even if it means affecting vision more

Tectonic Keratoplasty: Corneal transplantation done to restore the integrity of the globe, or restore corneal thickness when the cornea is melting, and perforation threatens

Therapeutic Keratoplasty: Corneal transplantation performed to refractory infections to eradicate or debulk the infected tissue.

## Tectonic /Therapeutic Keratoplasty:

Corneal trauma with tissue loss – mechanical, thermal, chemical

Severe infections

Connective tissue/immune mediated disorders

Ectasias with extreme thinning and threatened or actual perforation

# Tectonic /Therapeutic Keratoplasty Materials:

- Corneal (allografts)
- Sclera (auto or allo)
- Conjunctiva (autografts)
- Amniotic membrane
- Glue: Cyanoacrylate / fibrin
- Others: Bovine pericardial patch

# Tectonic /Therapeutic Keratoplasty

Small circular peripheral

Small circular paracentral

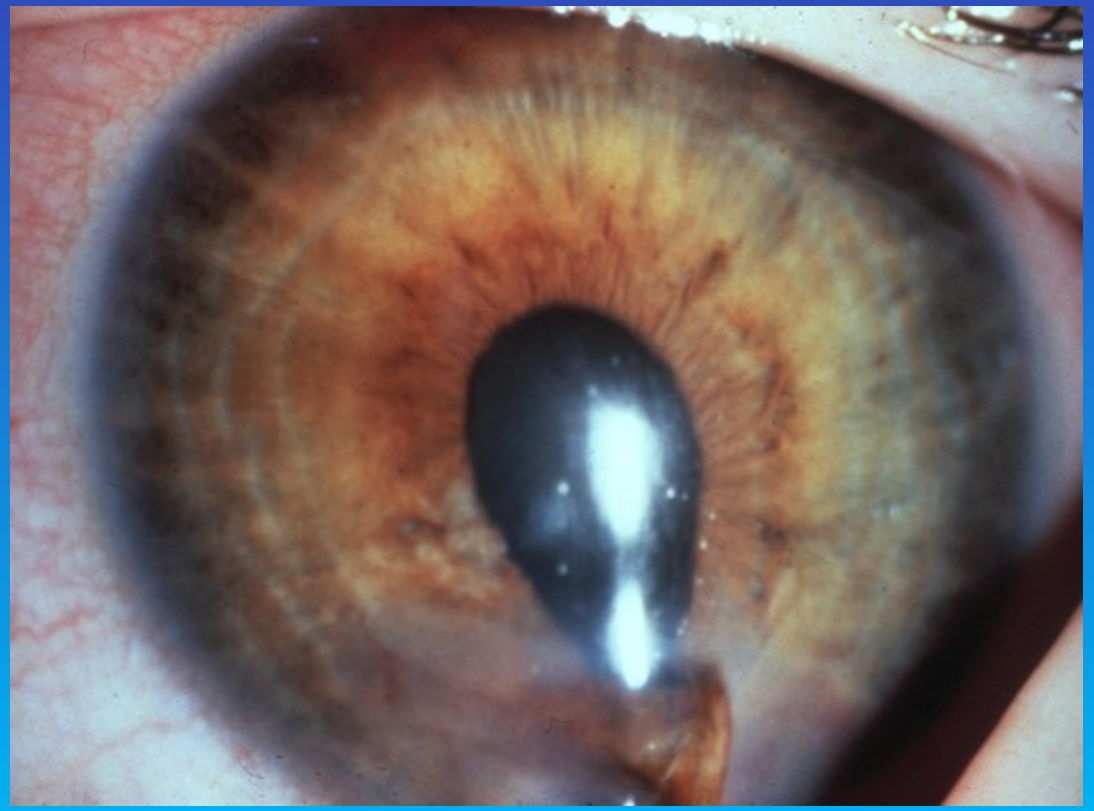
Crescentic / banana peripheral

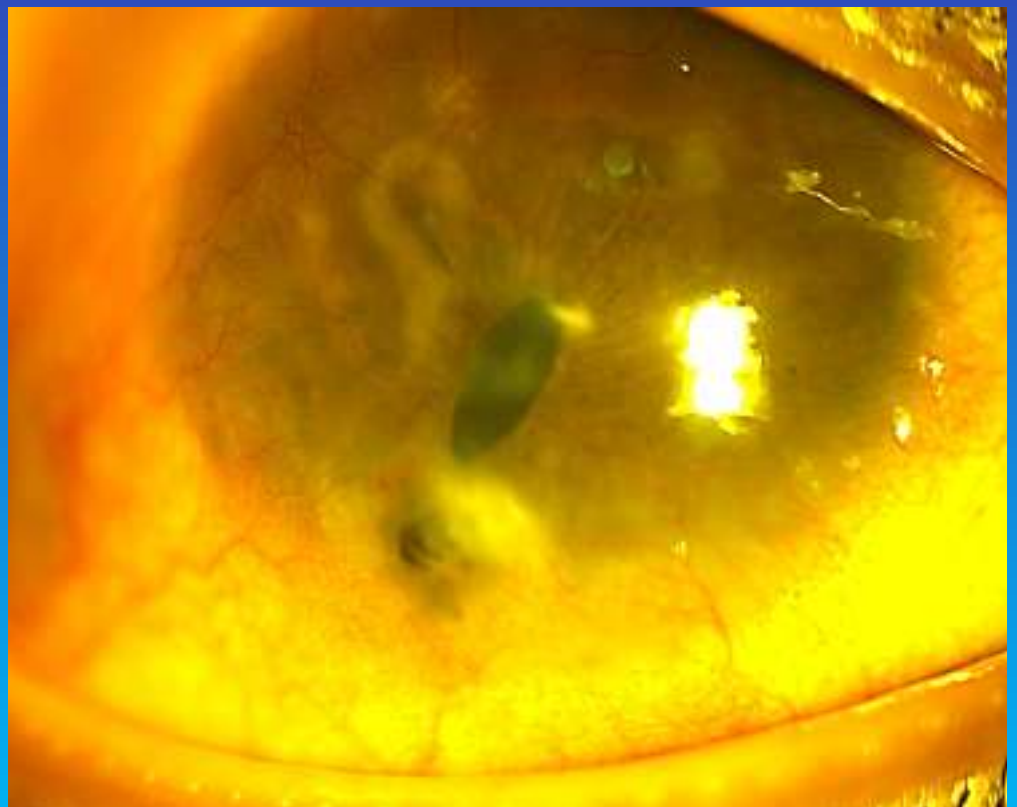
Central penetrating or deep lamellar

Tailor made to fit defect

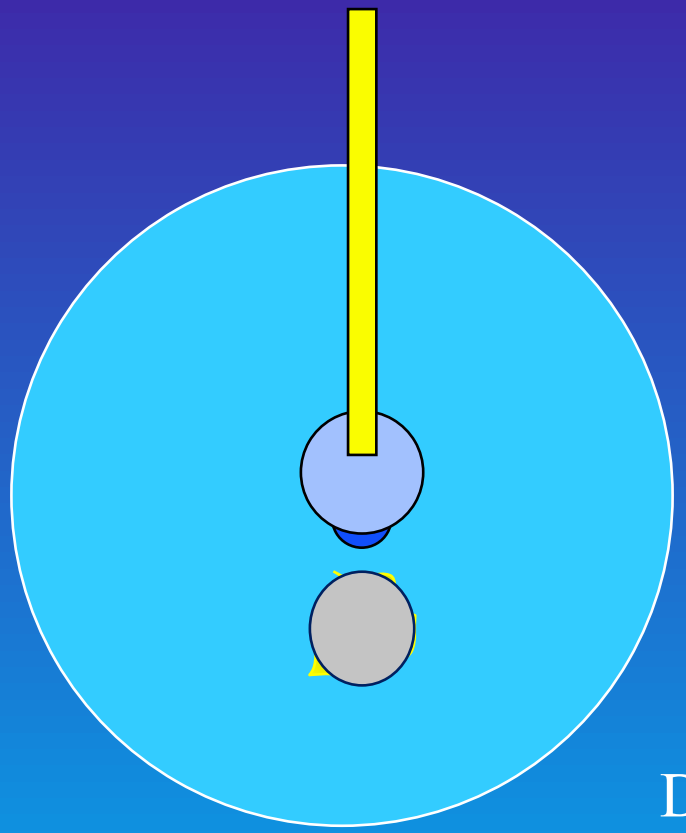
# Corneal trauma with tissue loss and iris prolapse

- Assess viability of iris – if it bleeds and is not contaminated reposit
- If it is necrotic, strangulated, contaminated – excise
- If in doubt, cut it out.



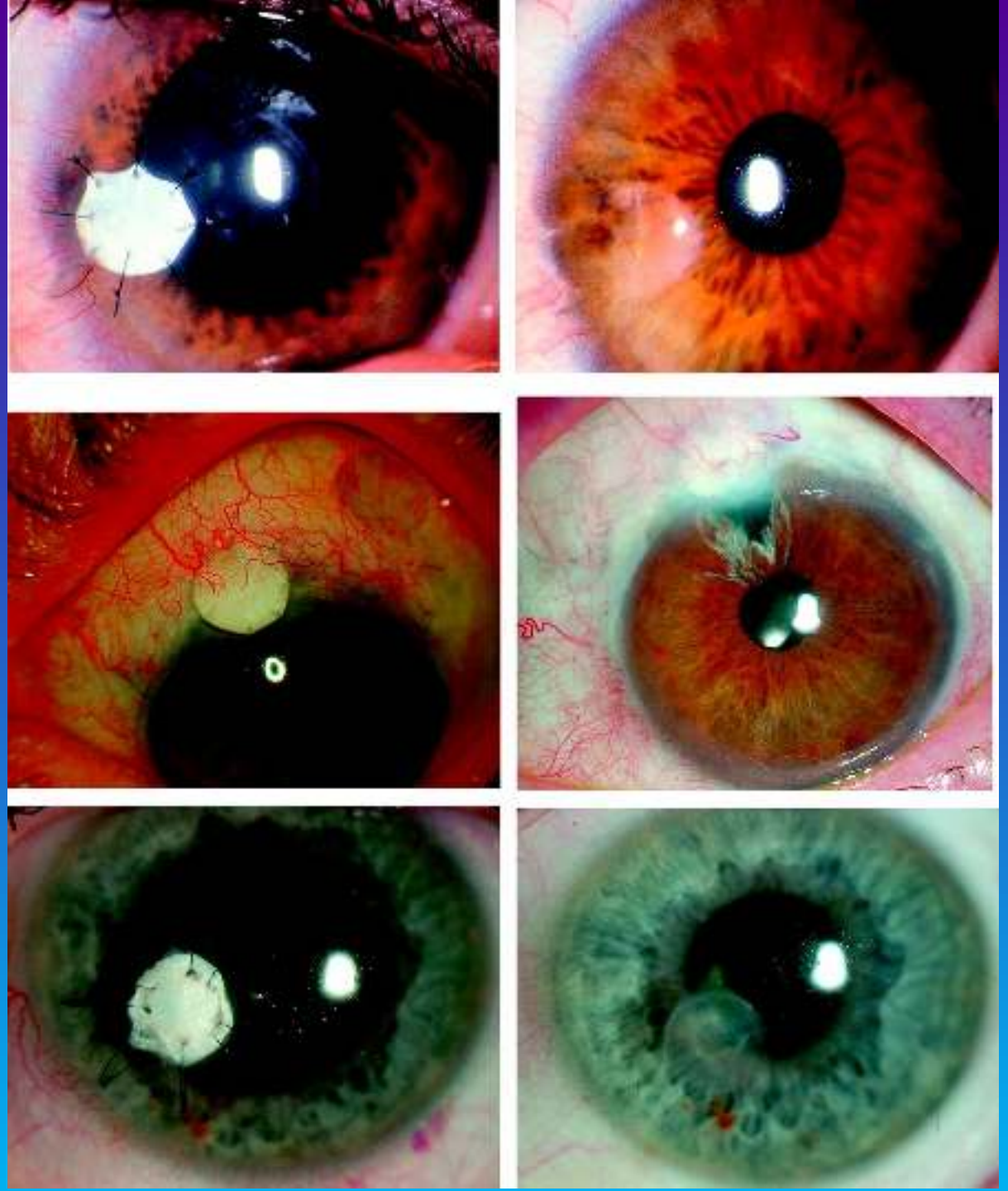


# Glue: cyanoacrylate gives better tectonic support than fibrin glue

Dua's Double Drape technique

Jaishree Gandhewar, V Savant, J Prydal, H Dua. Double drape tectonic patch with cyanoacrylate glue in the management of corneal perforation with iris incarceration. Cornea. 2013 May;32(5):e137-8.

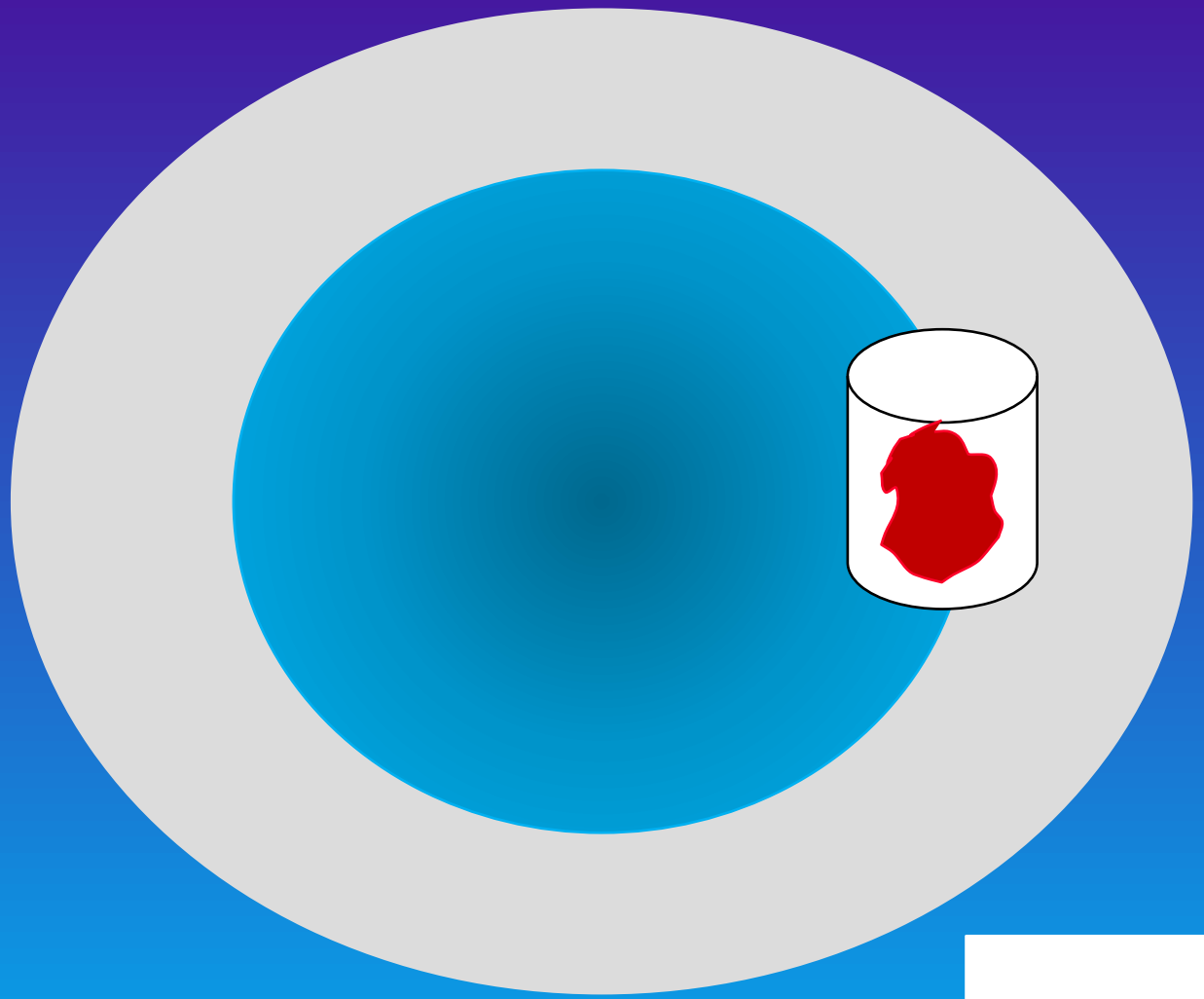


Lamellar autologous scleral patch graft

Becomes transparent with time!!

Prydal JI. Use of an autologous lamellar scleral graft to repair a corneal perforation. Br J Ophthalmol. 2006 Jul;90(7):924

# Corneal patch graft

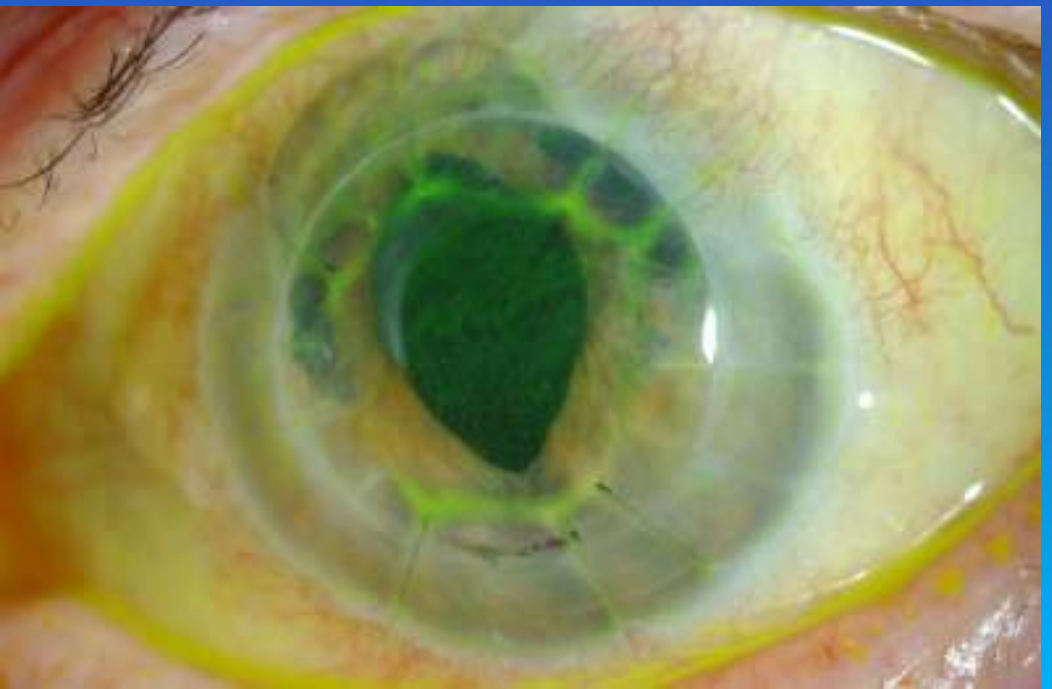


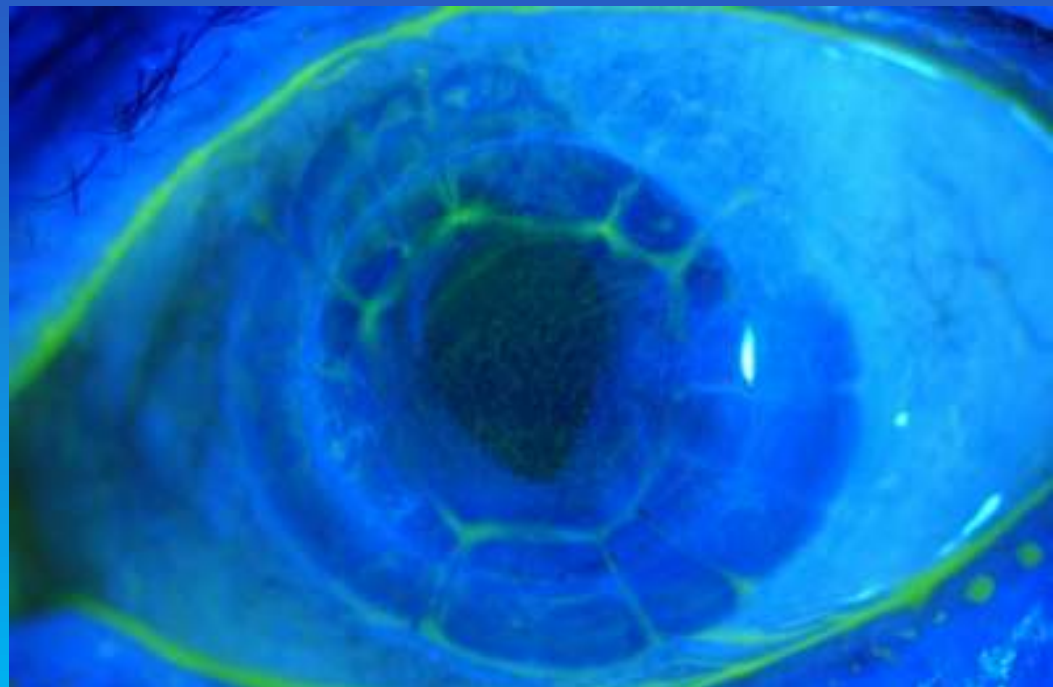
Trephine full thickness of cornea and deep lamellar depth of sclera

Cut cornea along circumference, of cornea and lamellar dissect sclera

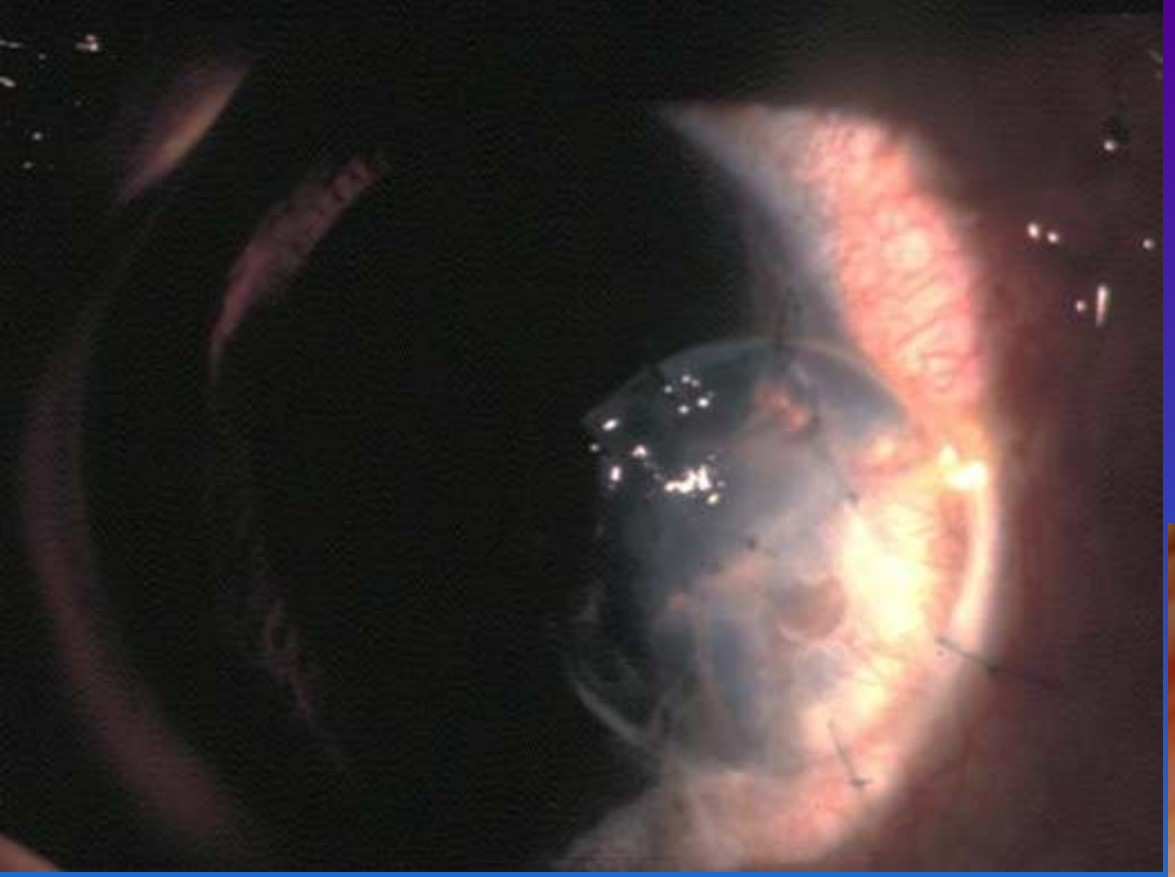
# Peripheral Perforation with Loss of Tissue

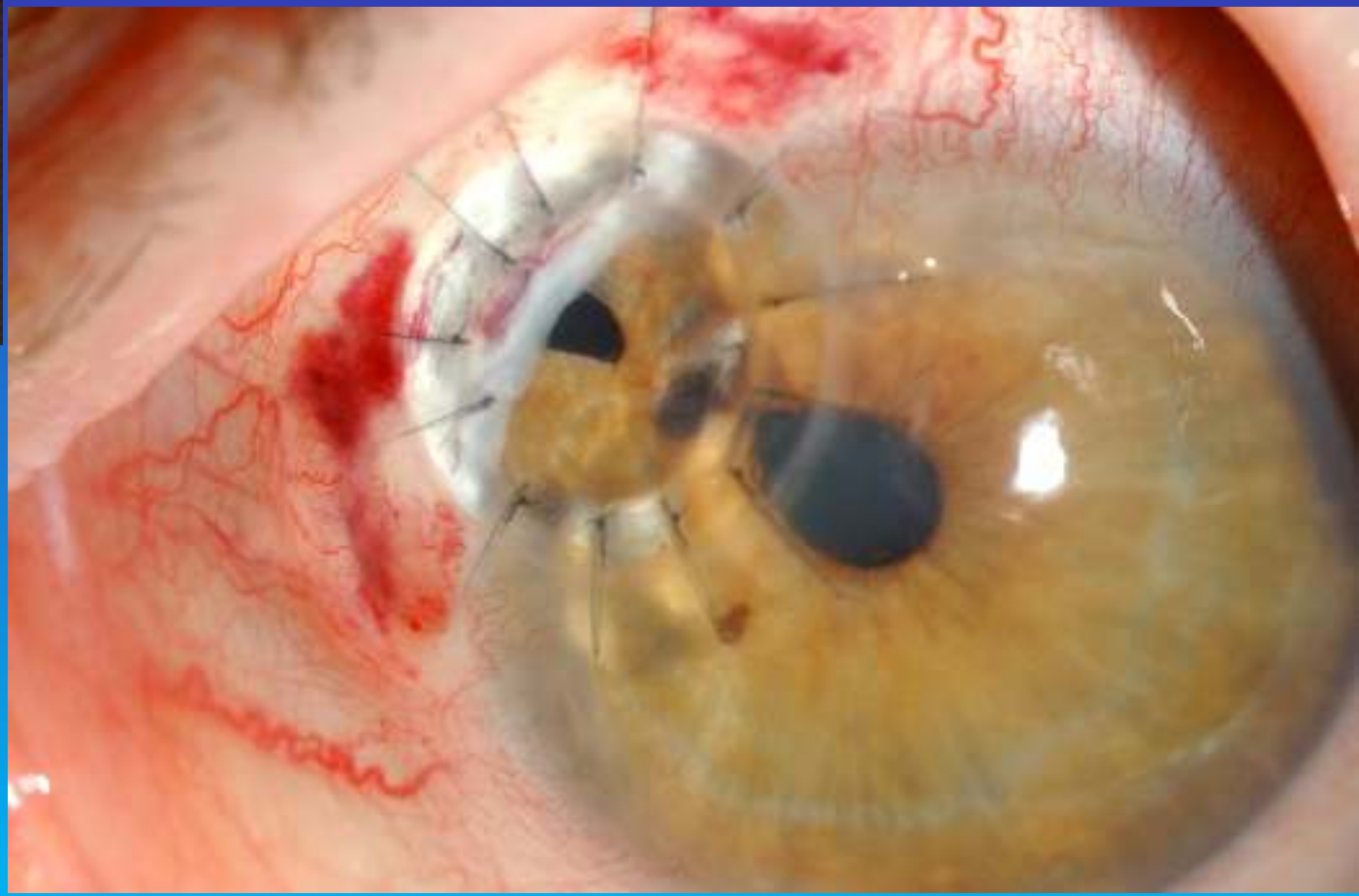
## Peripheral Tectonic Graft





# Peripheral Tectonic Graft

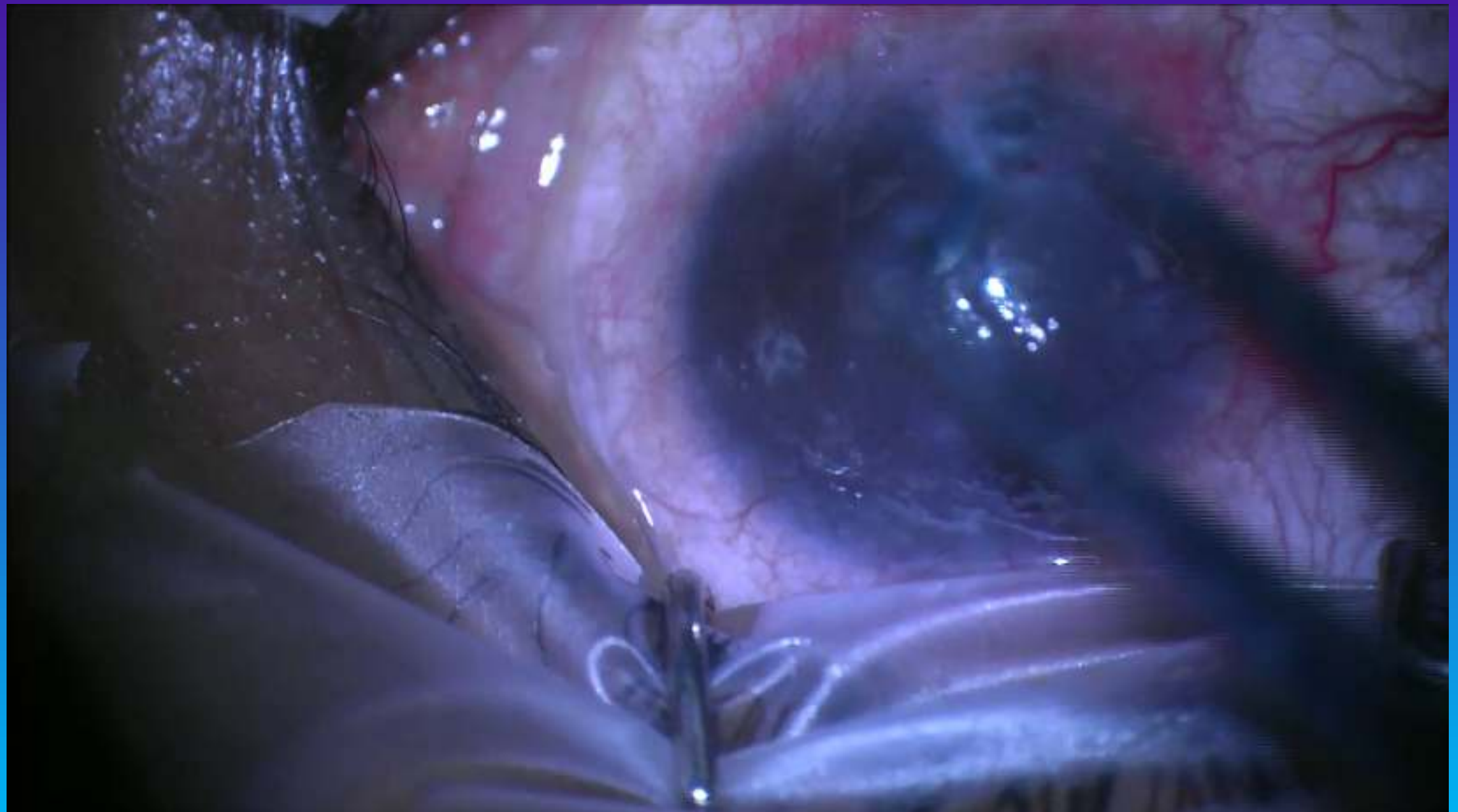




Circular corneal graft 5-6mm

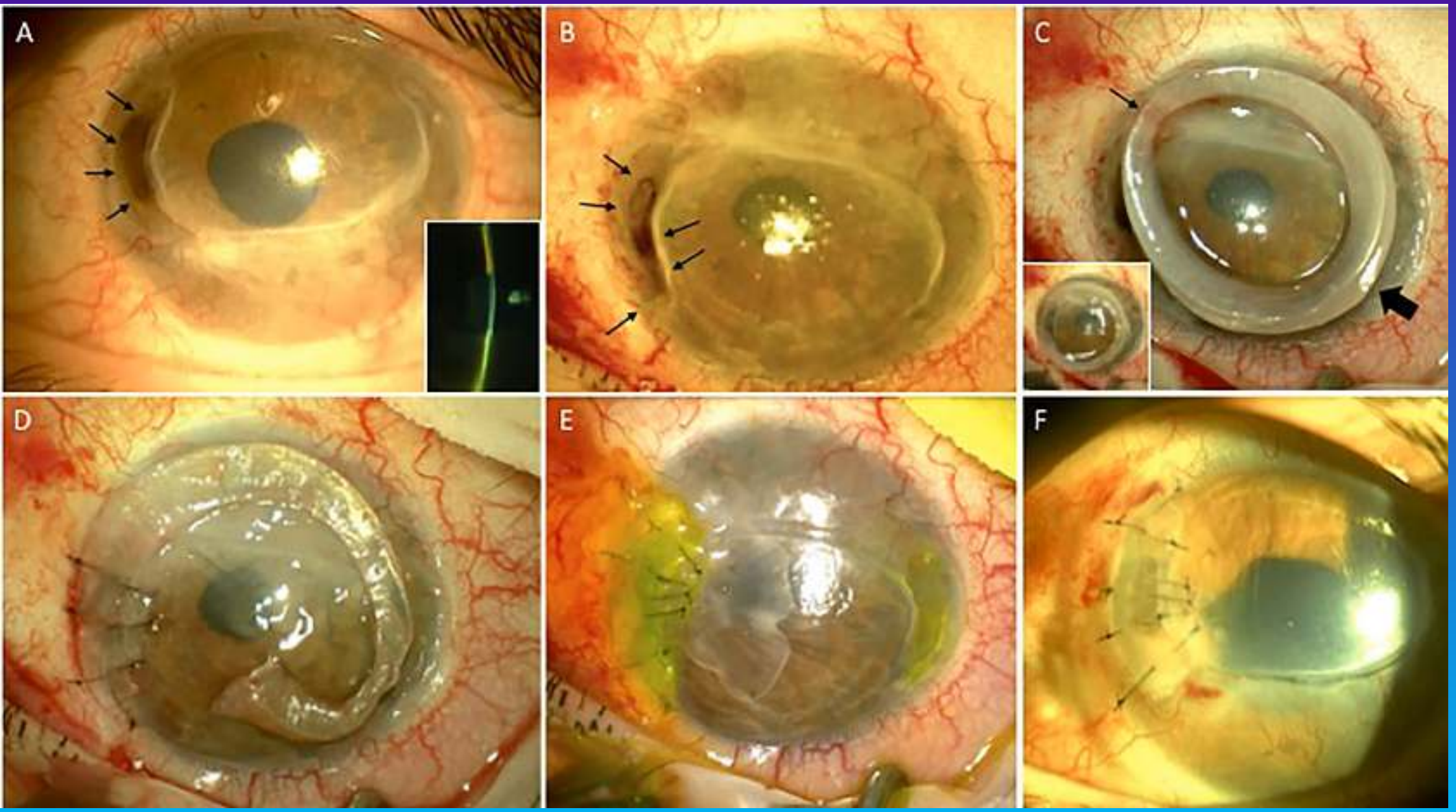
Crescentic lamellar scleral bed and full thickness host corneal trephination

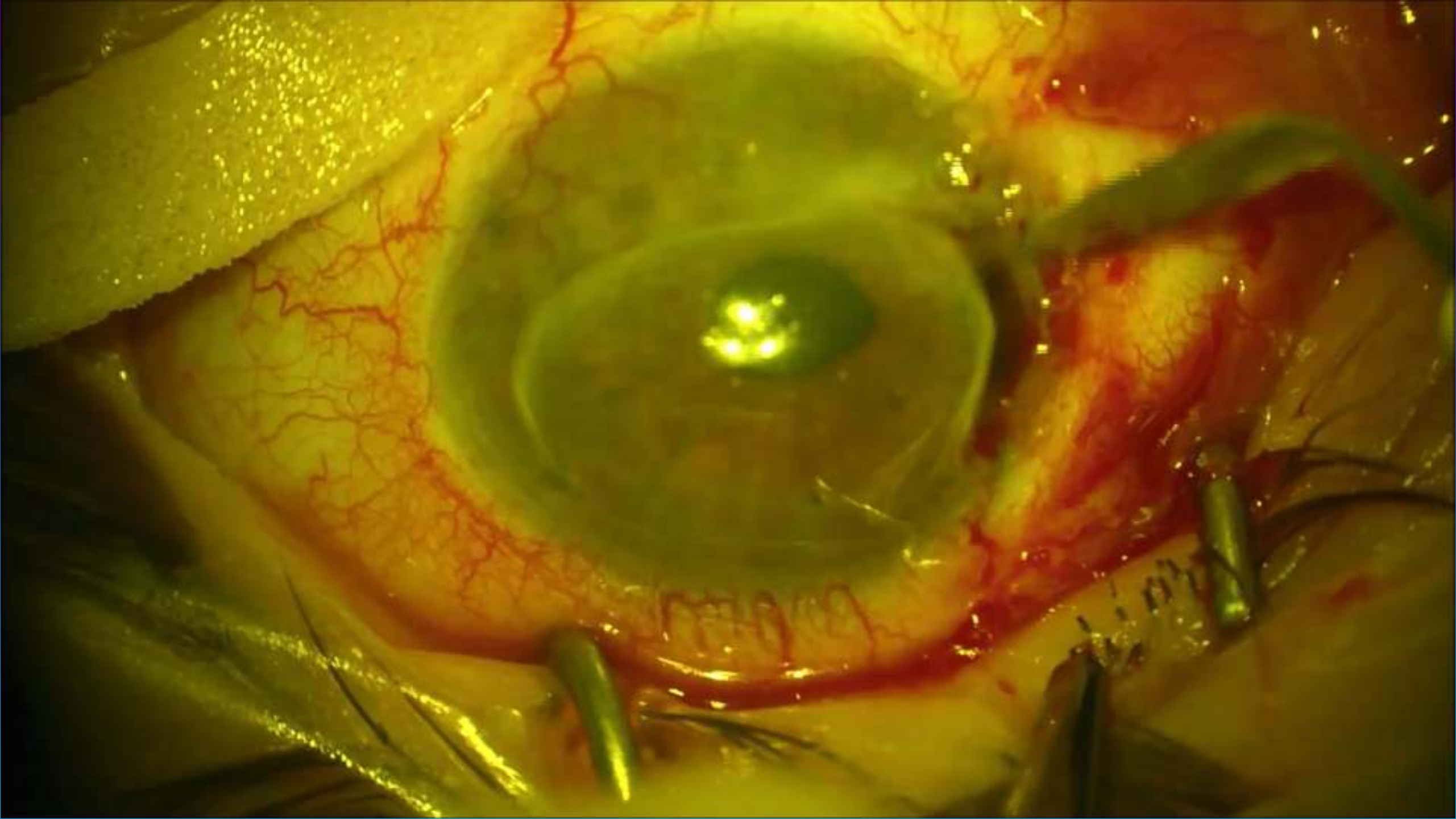
# Tectonic keratoplasty: Peripheral corneal patch graft



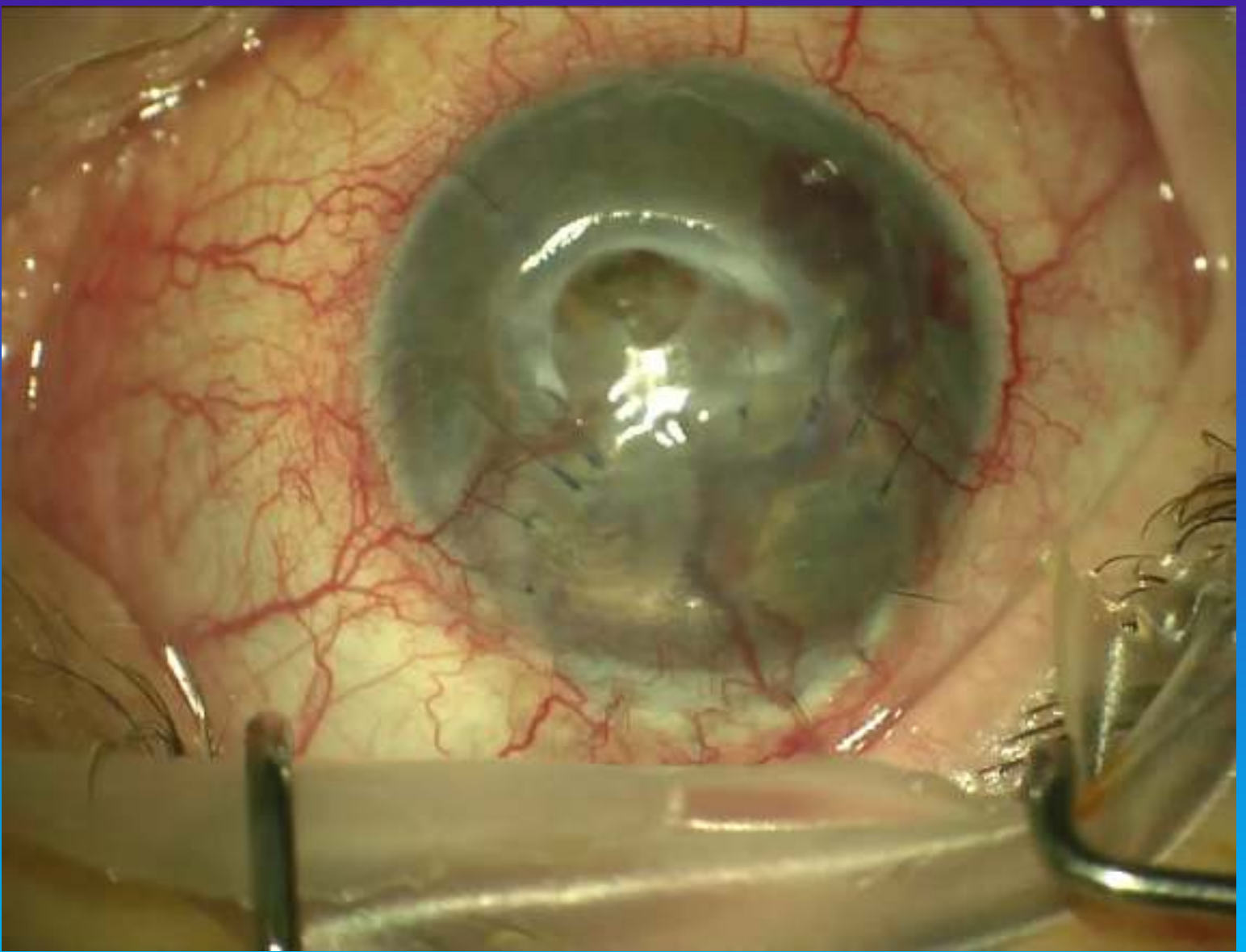
# Tectonic keratoplasty: 4 Months post op.

# Tectonic keratoplasty: Peripheral crescentic





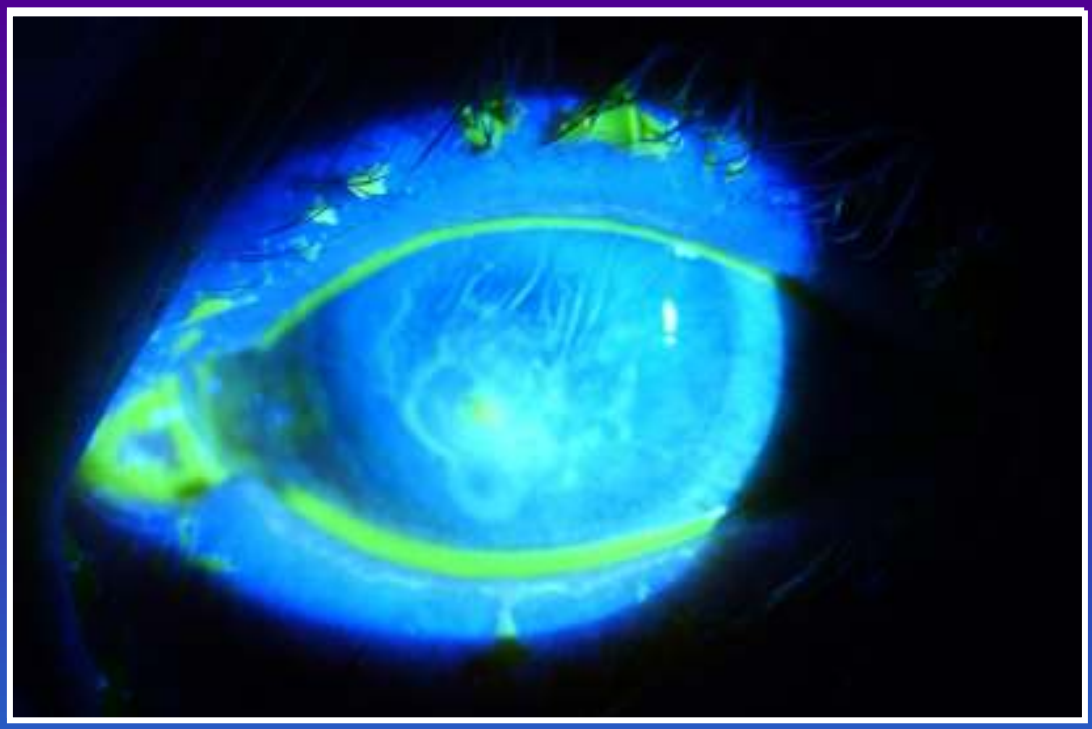
# Tectonic /Therapeutic Keratoplasty: Peripheral circular followed by central tectonic

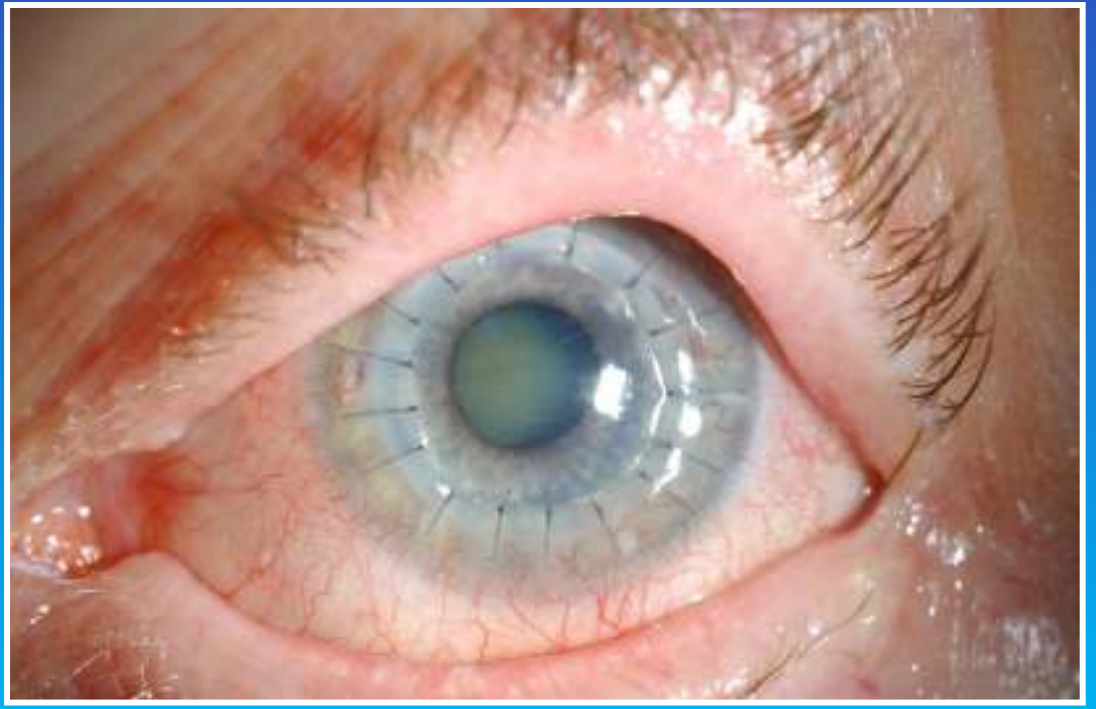


Patient with alcohol and drug abuse, vitamin A deficiency, chronic inflammation, superior melting with large perforation, repaired with a tectonic graft.

Now has occluded pupil, extensive synechiae and cataract and central melting

Preop. OCT and ultrasound



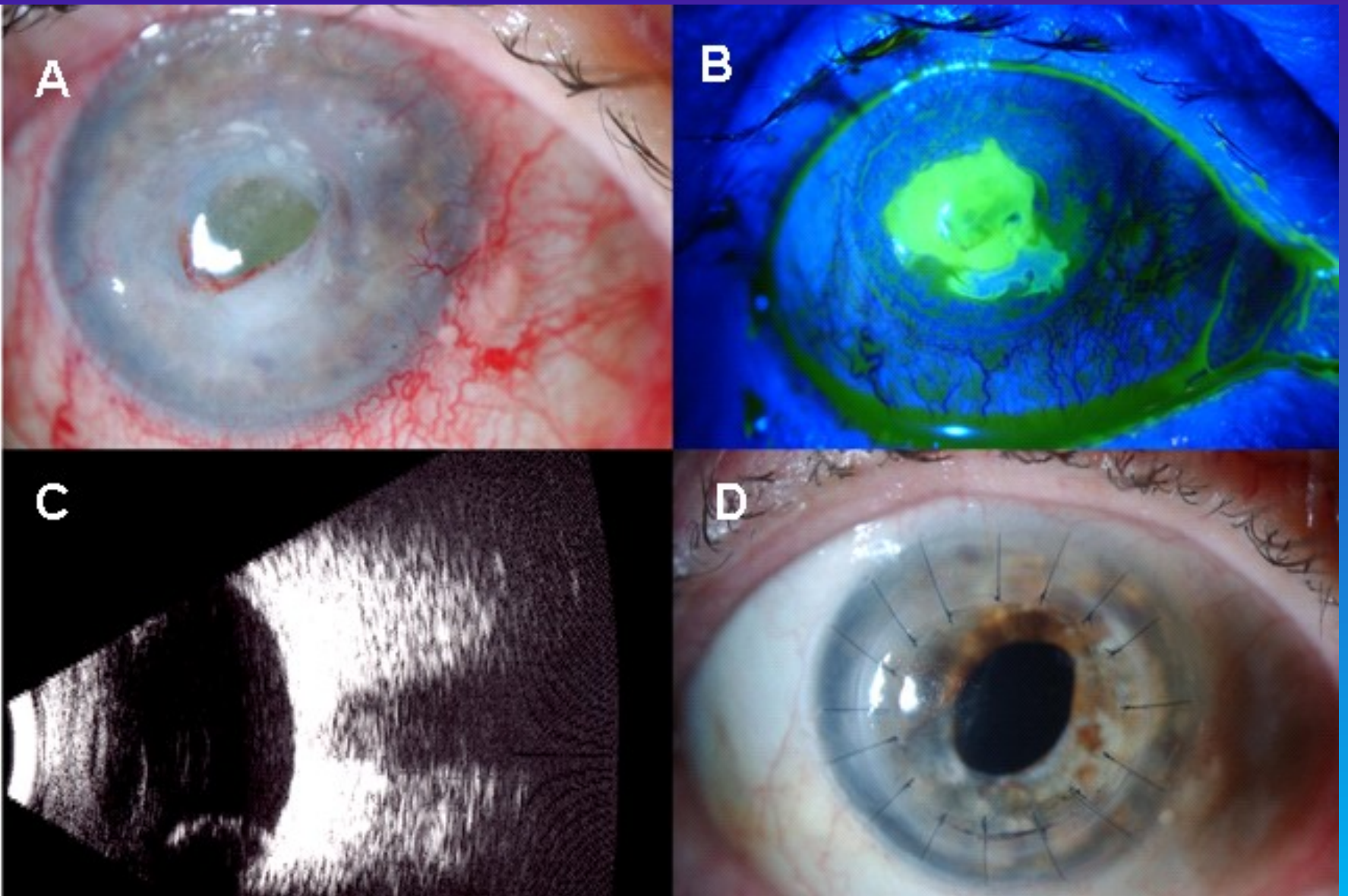


# Tectonic/Therapeutic graft in infectious keratitis with cataract

Active Keratitis: Avoid cataract extraction?
Risk of endophthalmitis

Glue at time of PK.

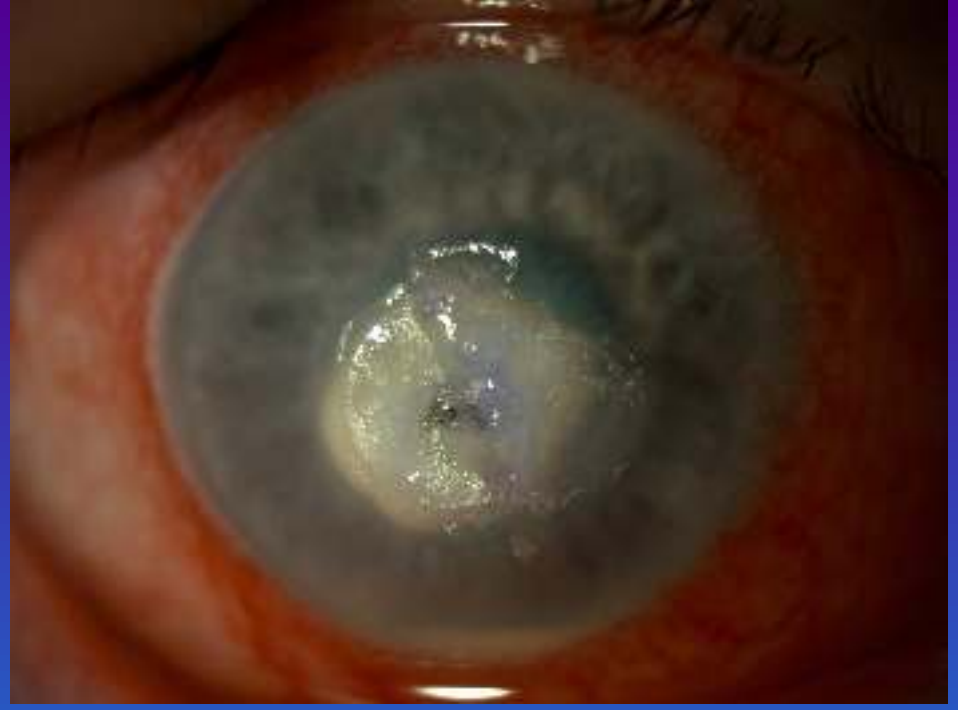
# Tectonic/Therapeutic graft in melting perforated cornea: Beware of chroidal effusion secondary to chronic hypotony




B-scan ultrasound

Seal perforation to let choroidals to settle

Drain choroidals at time of transplant.



Hot Graft in active perforated corneal ulcer. Cataract left alone

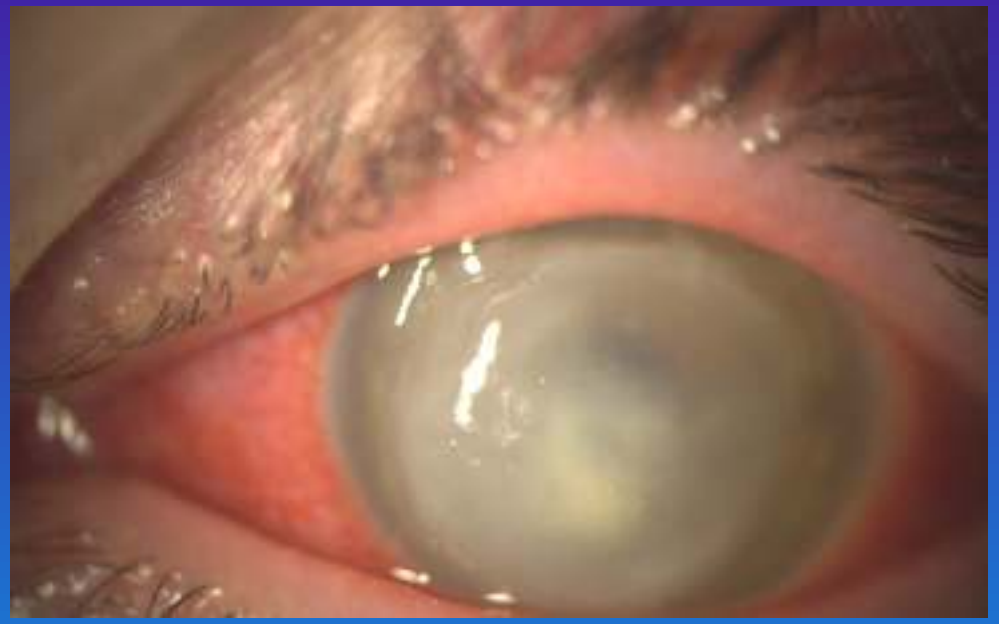
# Tectonic central penetrating corneal graft

21 years old male

Bilateral Lasik

Severe infection in left eye on day 3 post op.

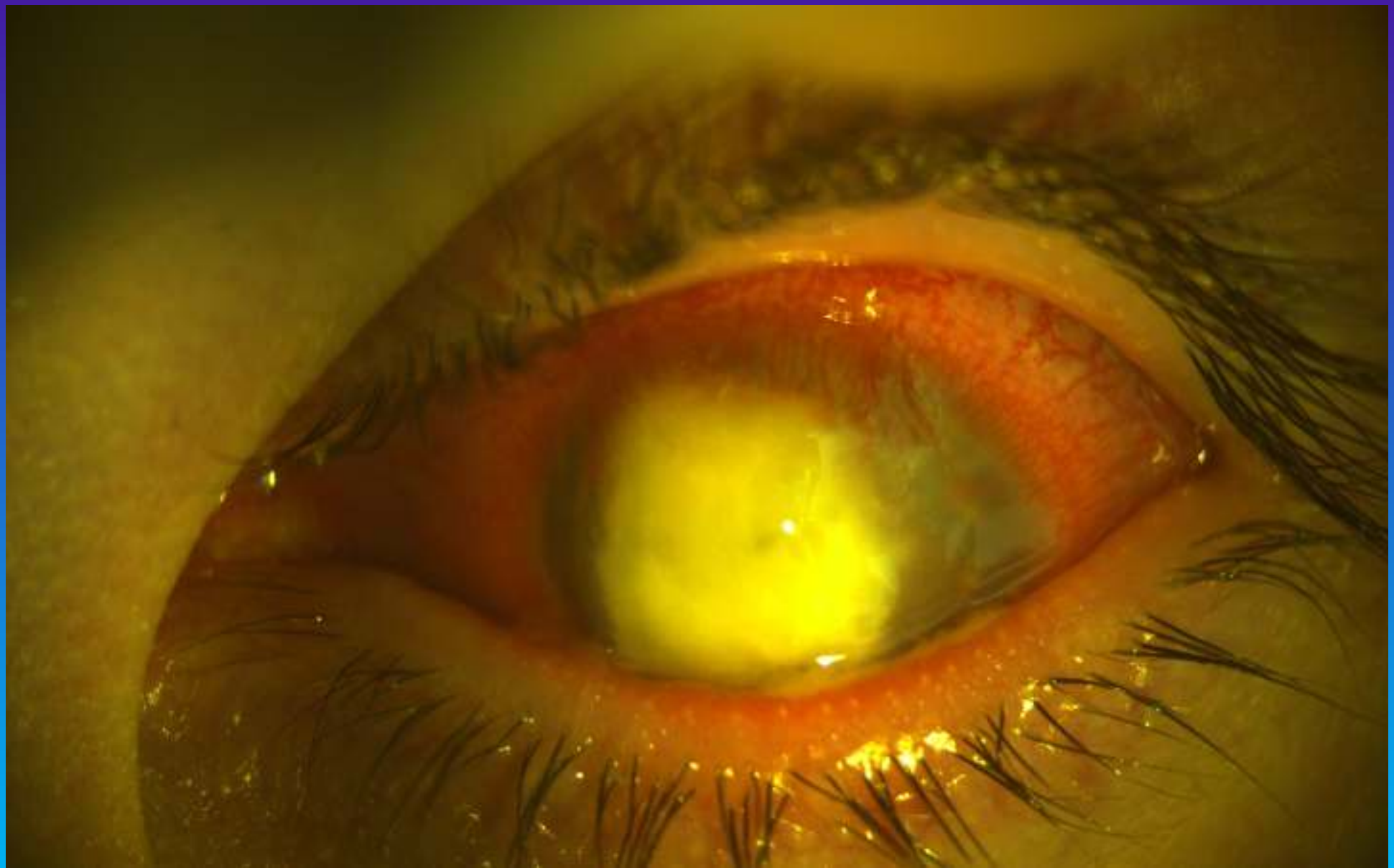
At presentation on day 6 post op.

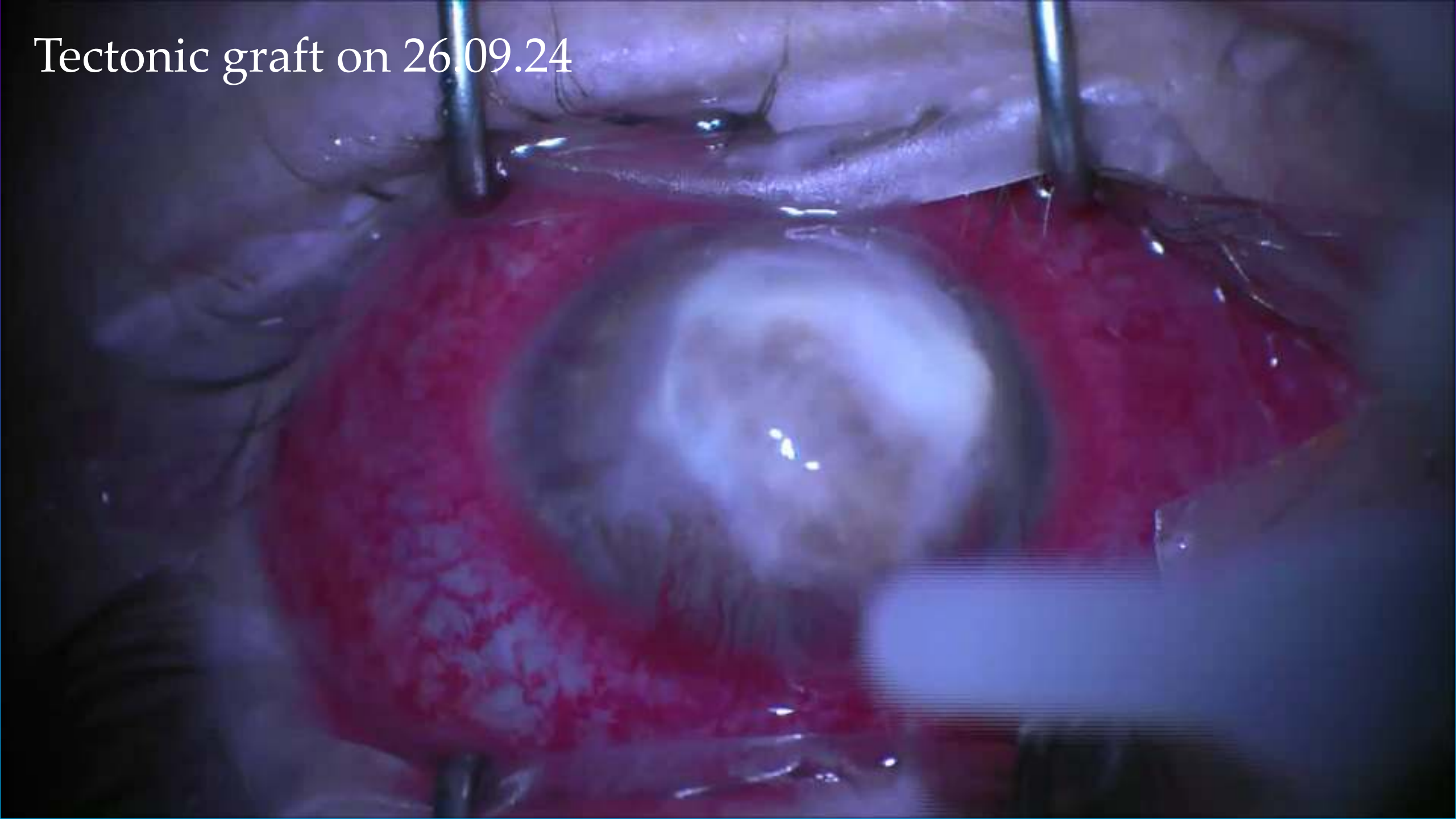


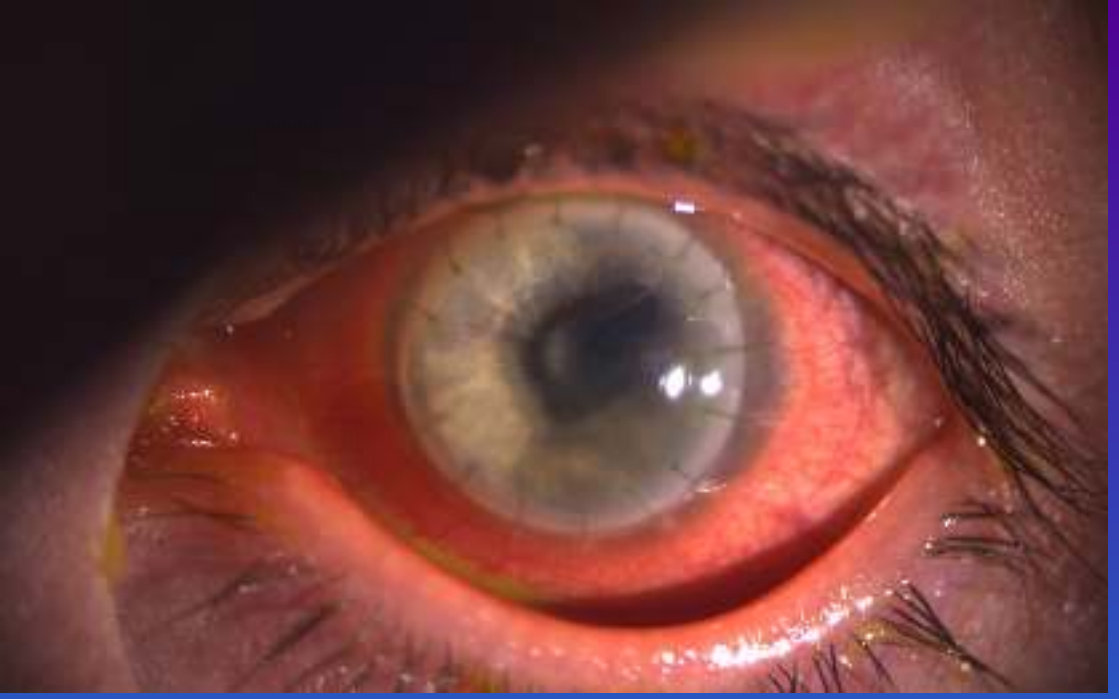
Day 10 post Lasik

Two weeks post Lasik

# Three weeks post Lasik



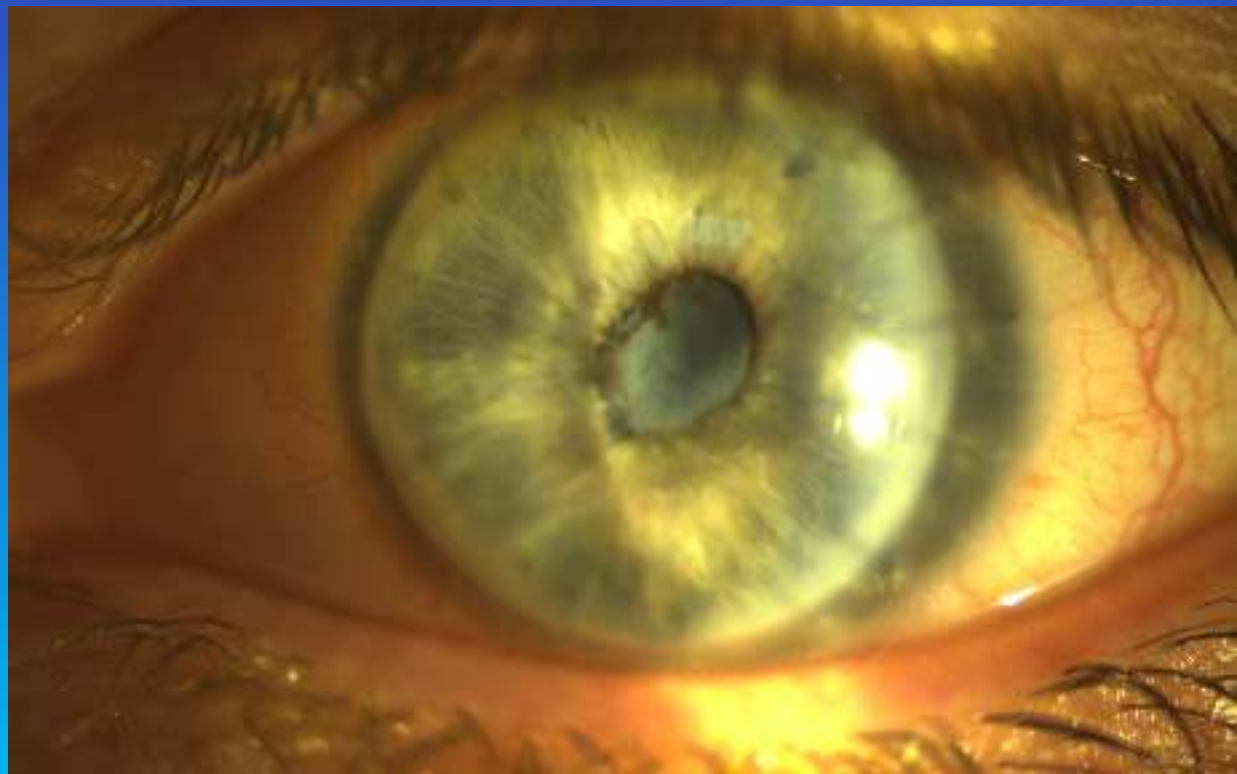

Tectonic graft on 26.09.24



Two weeks post tectonic graft

Three weeks post tectonic graft. Organised plaque on lens. ? Pupillary membrane

Two months and 1 week post tectonic graft



Three months post tectonic graft. Vision 6/18

# Next steps

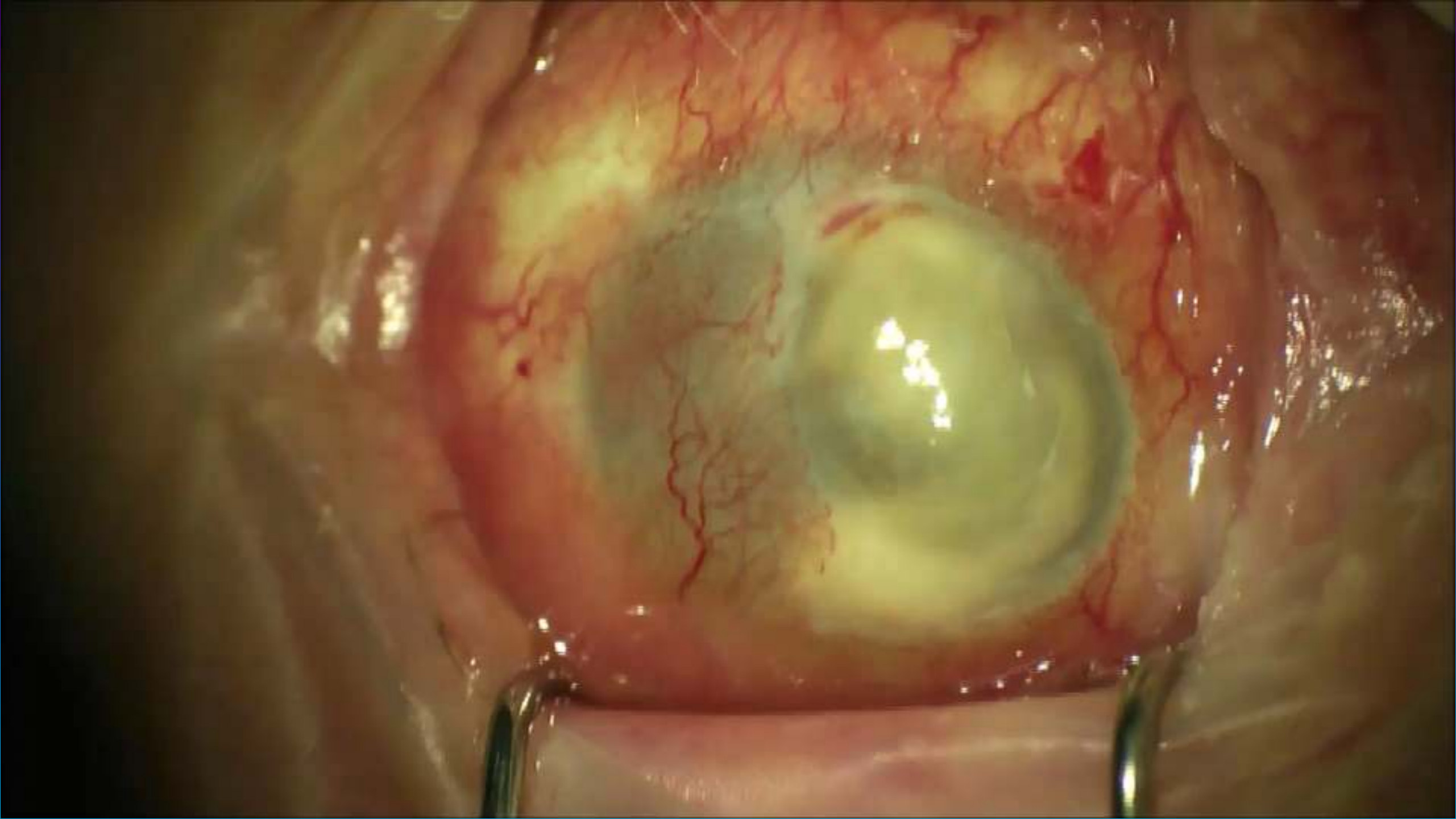
Pupilloplasty

Removal of anterior capsular plaque/pupillary membrane

Cataract extraction with implant /Suture removal

Power to implant?

Fate of graft?



# Summary and Comments

The purpose of tectonic grafts is to save structure, vision is a secondary consideration.

Tectonic objectives can be met with glue (fibrin and cyanoacrylate), amnion, conjunctiva, pericardial patch, sclera & cornea – on cornea, on sclera. A combination of these.

Must treat, continue to treat, the underlying infection or disease.

Simultaneously cataract surgery should be carefully considered and avoided if possible.

# Summary and Comments

Use interrupted sutures, oversize donor, fibrin glue if needed to address leaks.

Very large grafts: Glaucoma, PED and vascularisation.

Glaucoma treated with tube shunts rather than cyclo-cryo/diode.

Beware of choroidal effusion.

Queens Medical Centre,
Nottingham, England

# THANK YOU