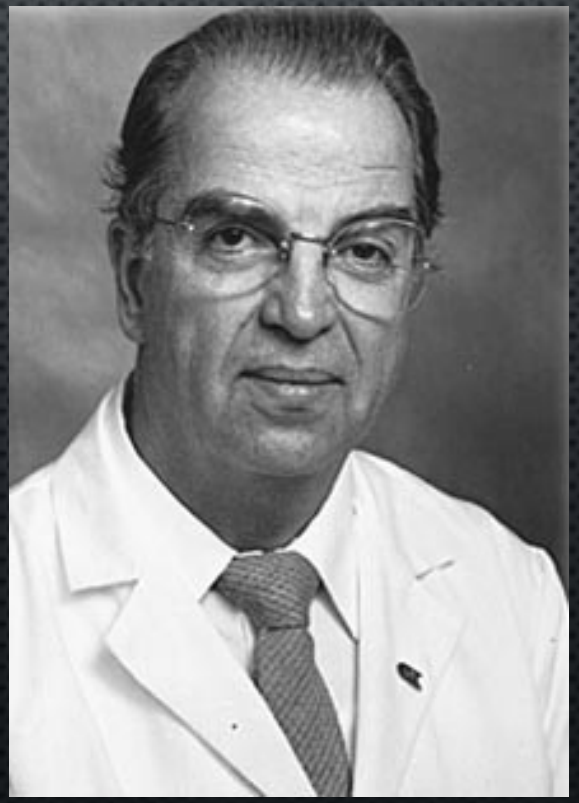
EOS

WE ONLY LOOK TALL BECAUSE WE STOOD ON THE SHOULDERS OF GIANTS



EVOLUTION OF MACULAR HOLE SURGERY

Sherif Sheta, MD, PhD

Professor and VR consultant

Cairo University

SURGICAL TREATMENT FOR IMH

- STARTED ON 1991 BY KELLY AND WENDEL.
- STANDARD TECHNIQUE WAS VITRECTOMY, PH SEPARATION, AND GAS TAMPONADE WITH POST-OPERATIVE PRONE POSITIONING WITH EXCELLENT RESULTS (90% CLOSURE RATE).
- LATER IT WAS SHOWN THAT ILM PEELING INCREASES THE CLOSURE RATE AND LOWERS THE REOPENING RATE (ECKARDT,1997).

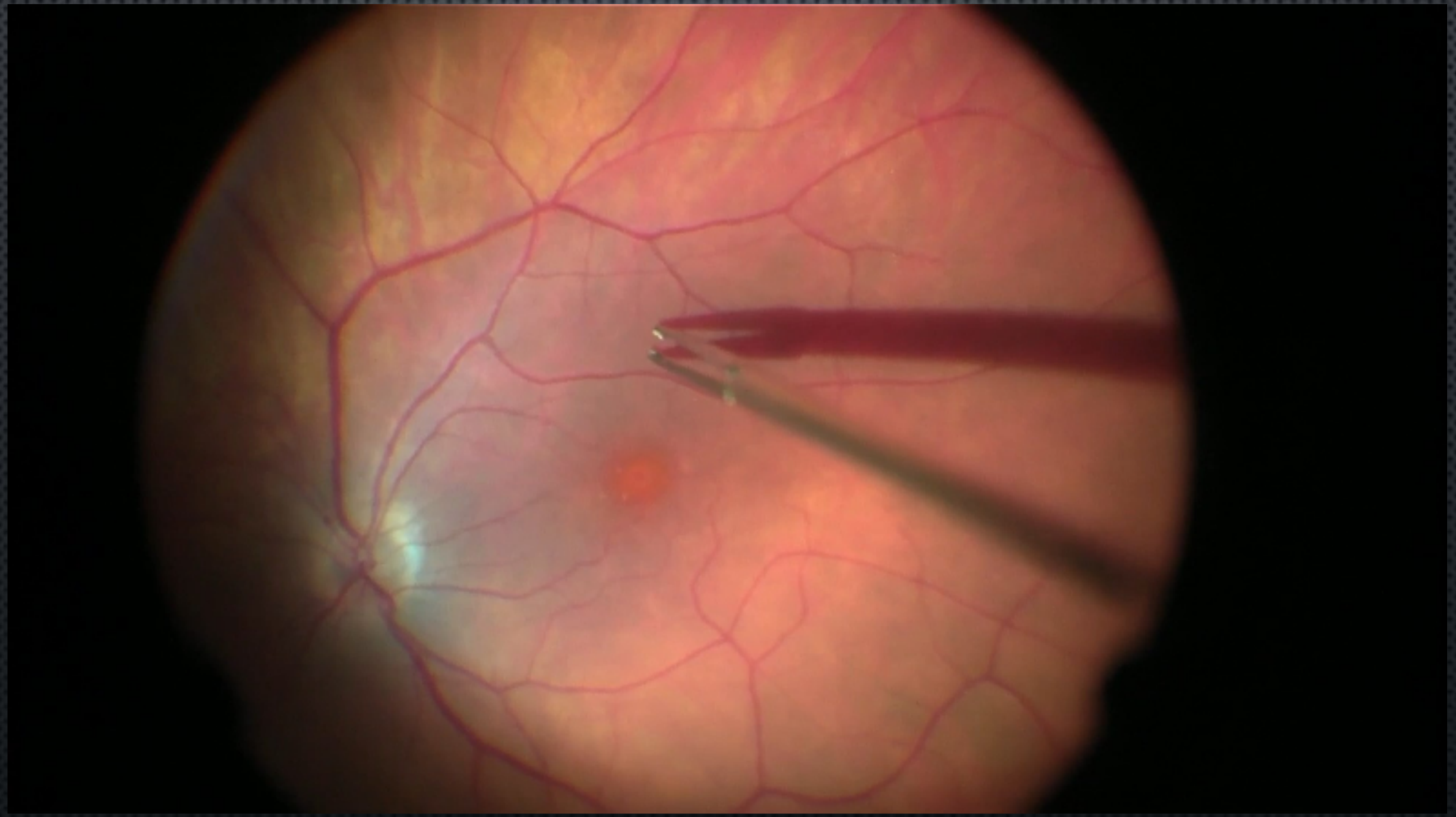
MANAGEMENT OPTIONS

- VITRECTOMY WITH PH SEPARATION.
- VITRECTOMY WITH PH SEPARATION AND COMPLETE ILM PEEL.
- VITRECTOMY WITH PH SEPARATION AND ILM FLAPS (INVERTED FLAP, HINGED FLAP, FREE FLAP, MULTILAYER FLAP, TEMPORAL COVER FLAP AND SHIFT).
- MANAGEMENT OF FAILED MH CLOSURE.

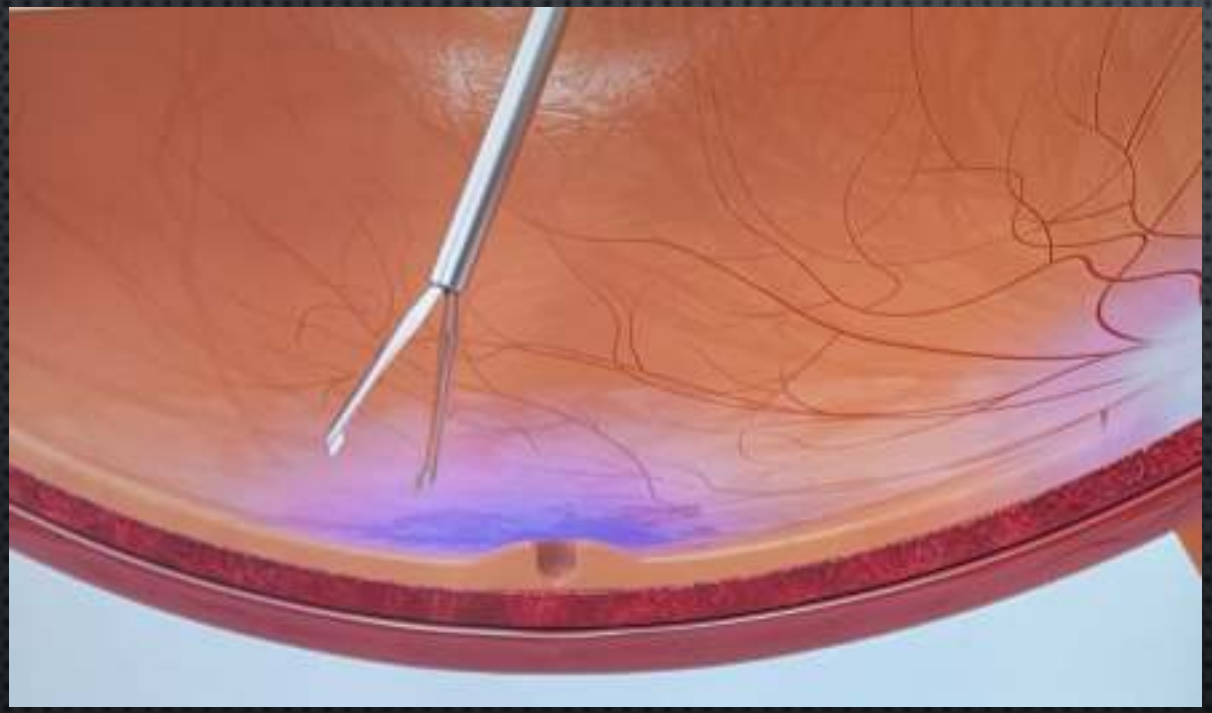
ILM PEELING

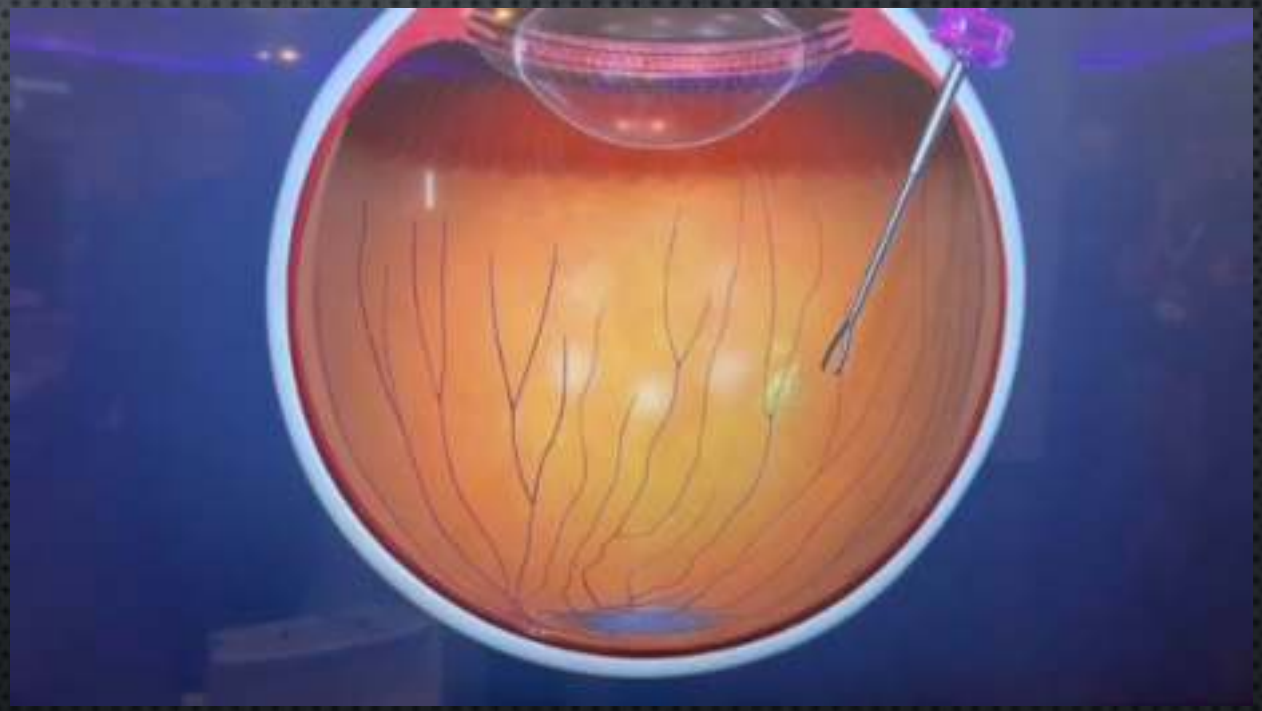
- Always use stain.
- High magnification (Green lens of resight or contact macula lens).
- Start inferior to macula near a blood vessel (avoid starting above a blood vessel or above the papillo-macular bundle).
- Pinch and peel (end gripping forceps)
- Pierce and peel (sharp needle or MVR- Risky)
- Create a flap and peel:
  - Brush by a scraper (Tano's diamond dusted)
  - Brush by a serrated flexi loop (27 gauge).

CREATING AN ILM FLAP



ILM PEELING (PINCH AND PEEL)





27 GAUGE SERRATED LOOP (FLEXI-LOOP)

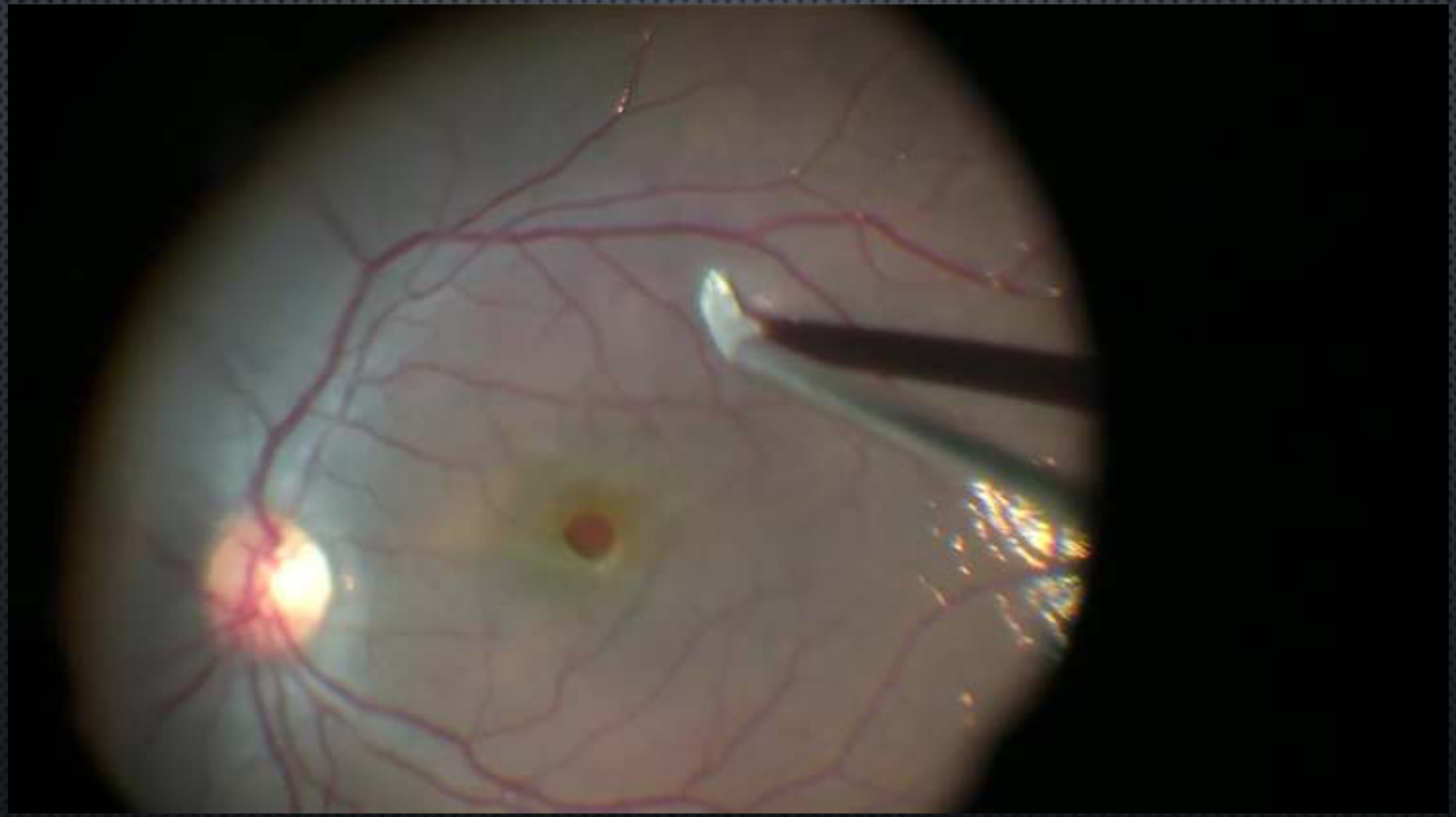
- VERY DELICATE
- LEAST TRAUMATIC
- LIGHT WEIGHT (FEATHERY LIKE)
- RETRACTABLE (EASY ENTRY AND EXIT THROUGH VALVED CANNULAS).
- YOU CAN ADJUST THE FLEXIBILITY OF THE LOOP.

PPV WITH COMPLETE ILM PEEL

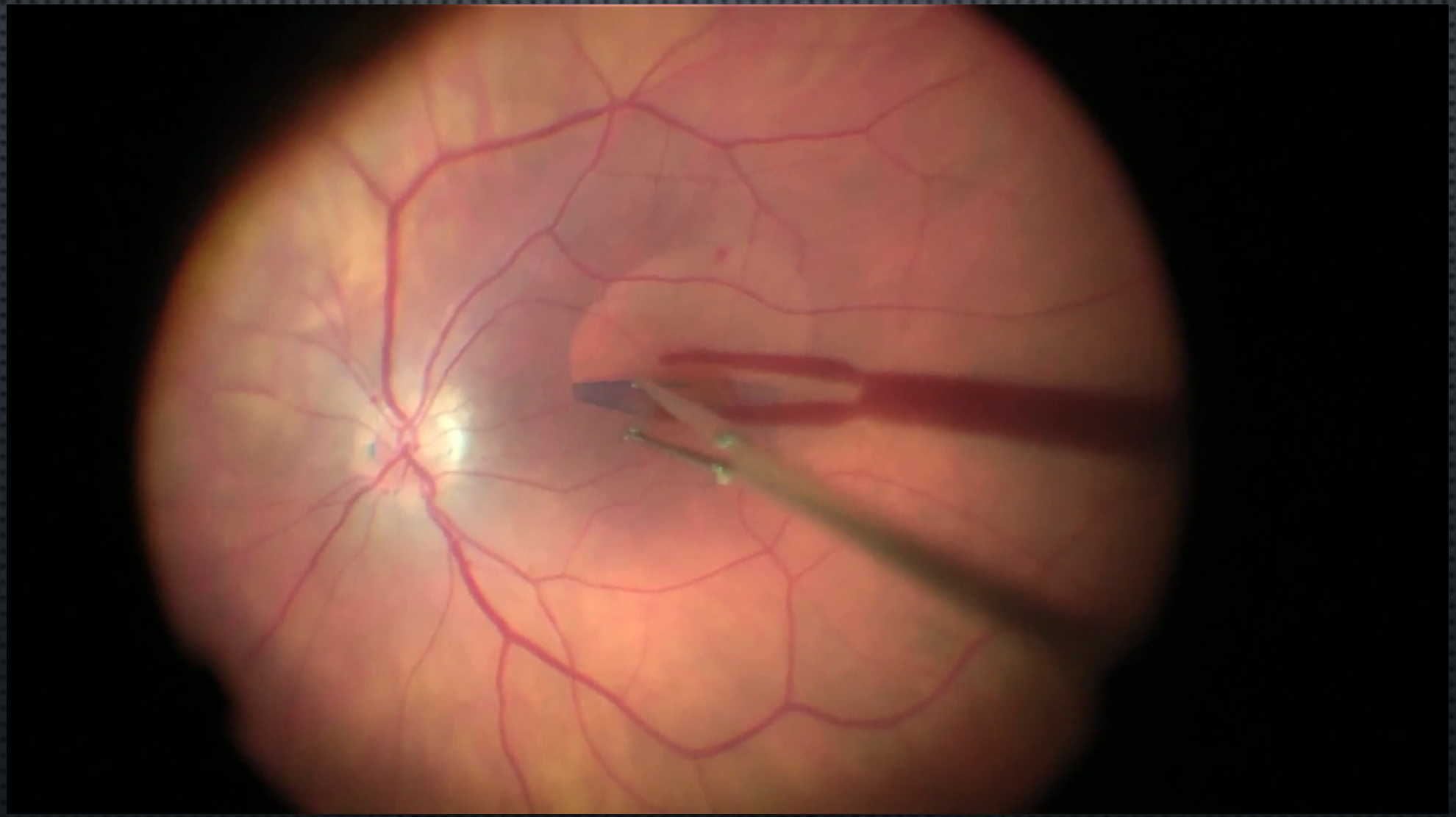
PEEL AND REMOVE VS PEEL AND UTILIZE ?

- INSTEAD OF COMPLETE ILM PEEL NAWAROSKI SUGGESTED USING AN INVERTED ILM FLAP TO PLUG AND CLOSE THE MH.
- SEVERAL MODIFICATIONS HAVE BEEN ATTEMPTED TO USE THE ILM FLAP:
  - INVERTED FLAP
  - HINGED FLAP
  - MULTILAYER FLAP
  - FREE FLAP
  - TEMPORAL FLAP
  - SHIFT (SHETA)

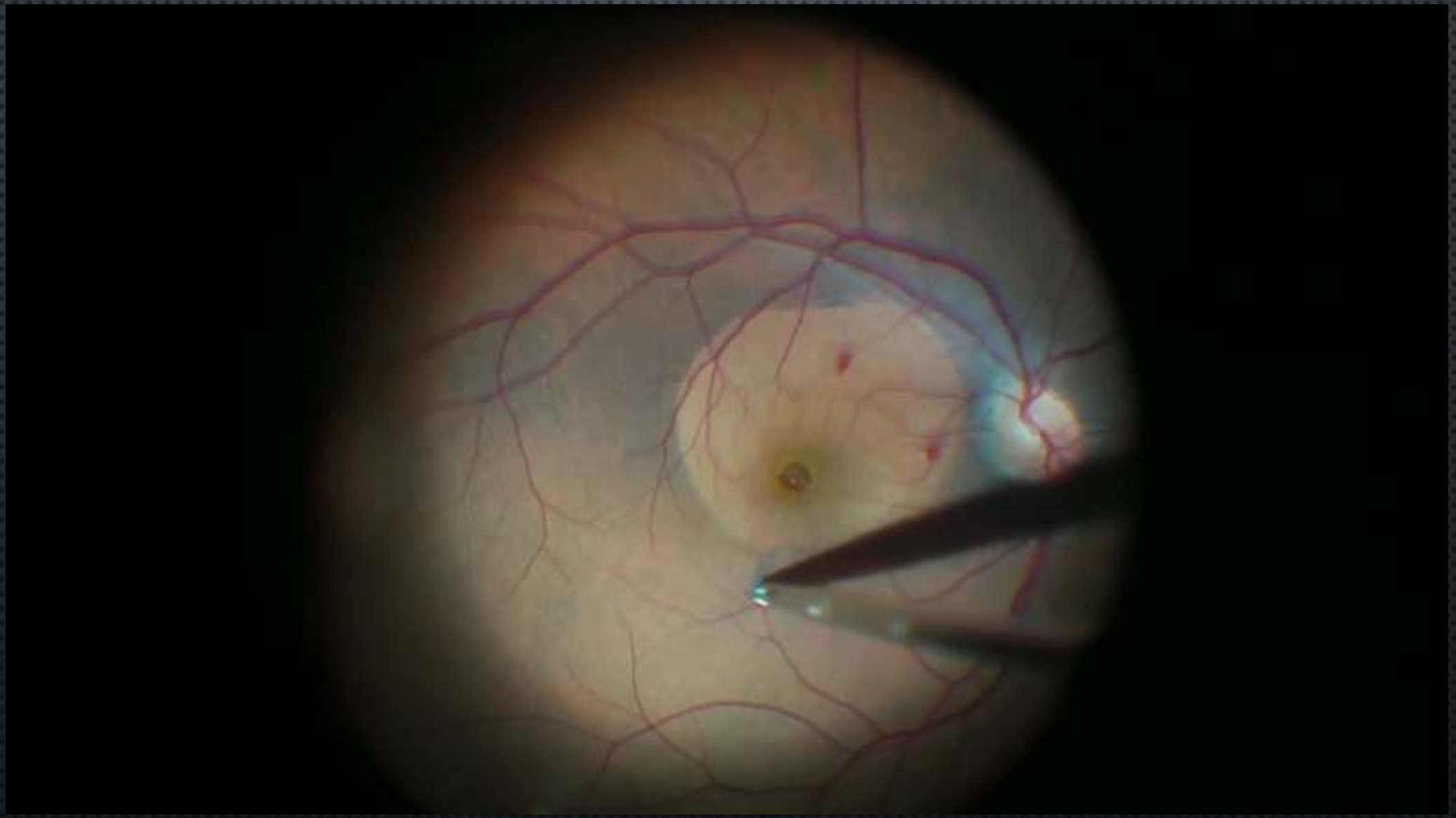
HINGED ILM FLAP



IMH, MULTILAYER (ENVELOP) TECHNIQUE

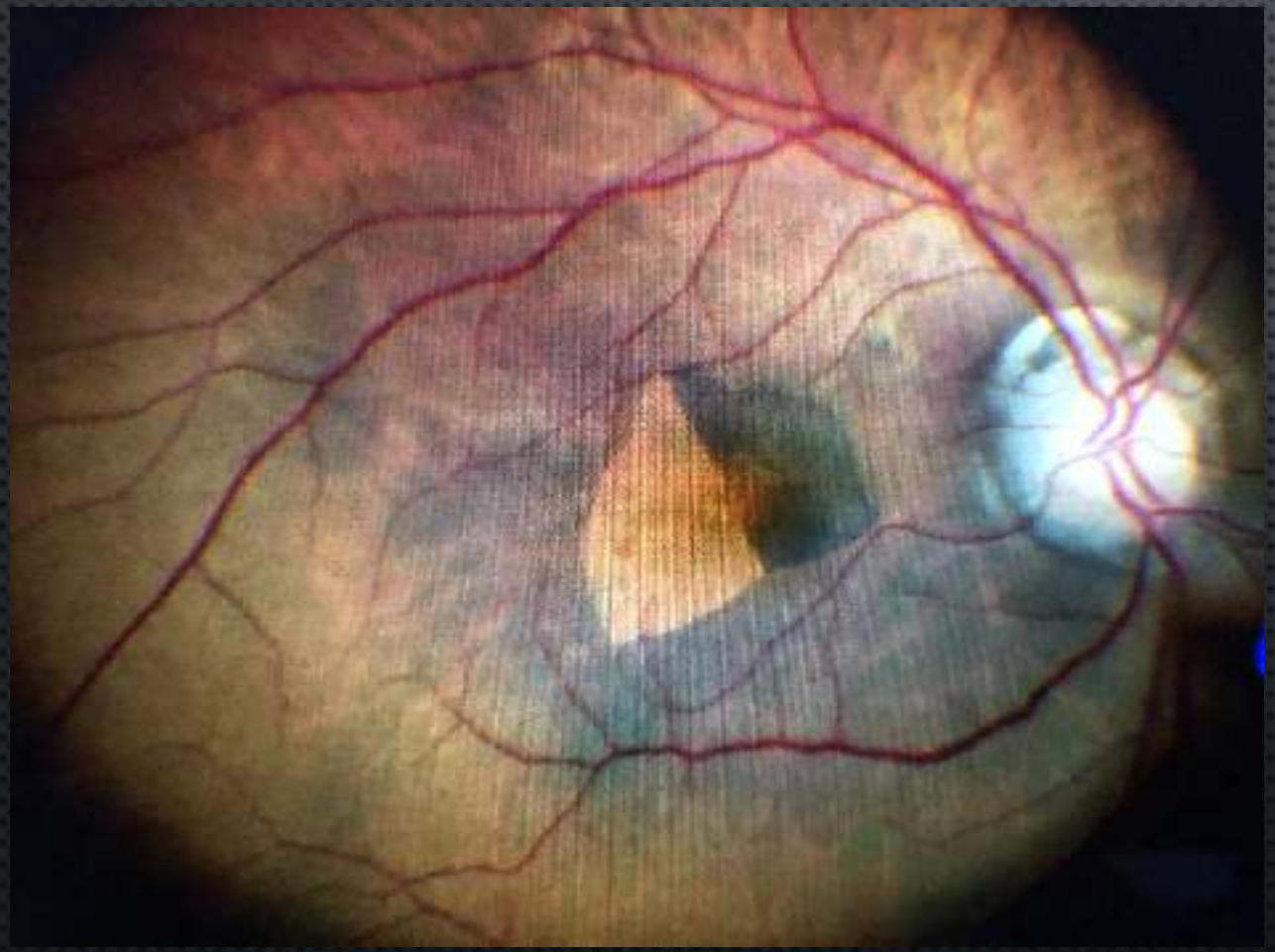


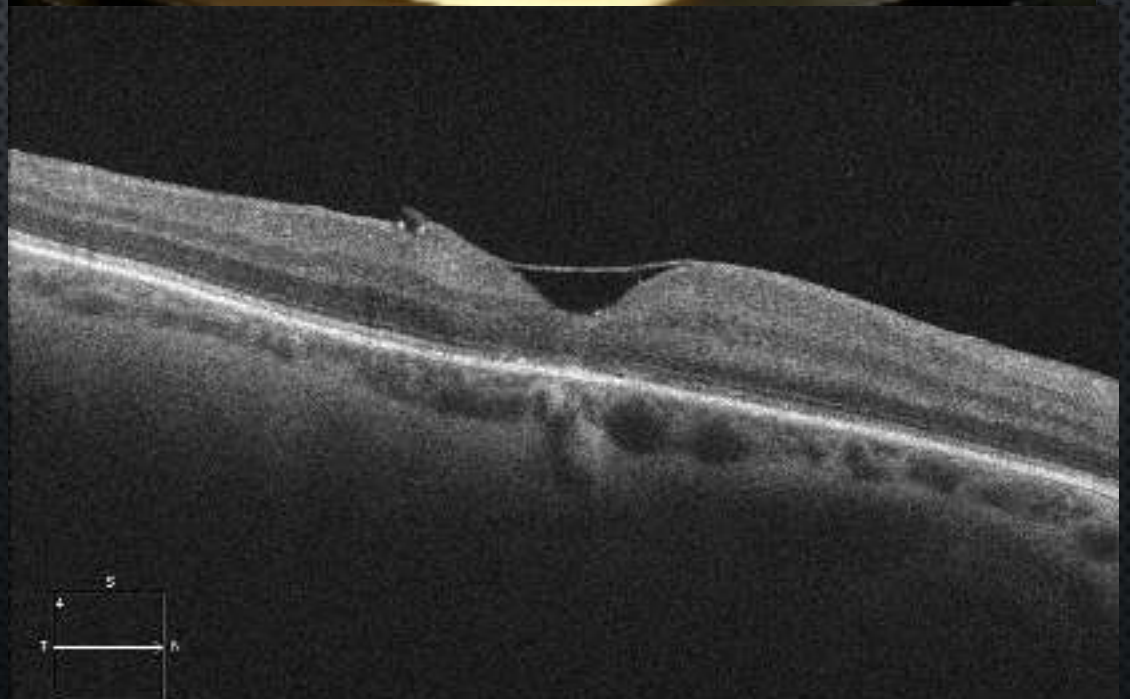
ILM, FREE FLAP



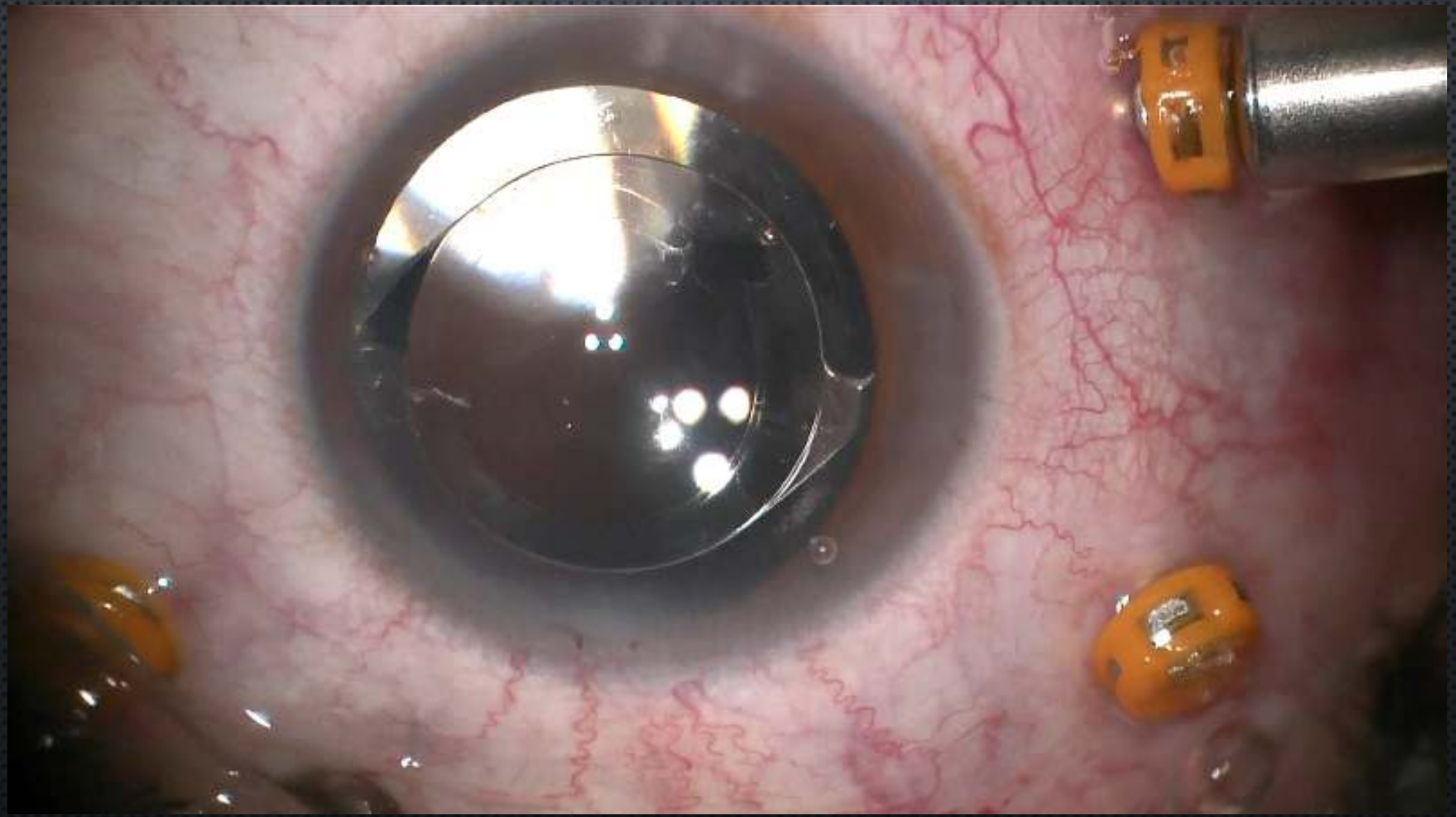
ILM INVERTED FLAP FOR MH (GLIAL PLUG)

TEMPORAL COVER ILM FLAP

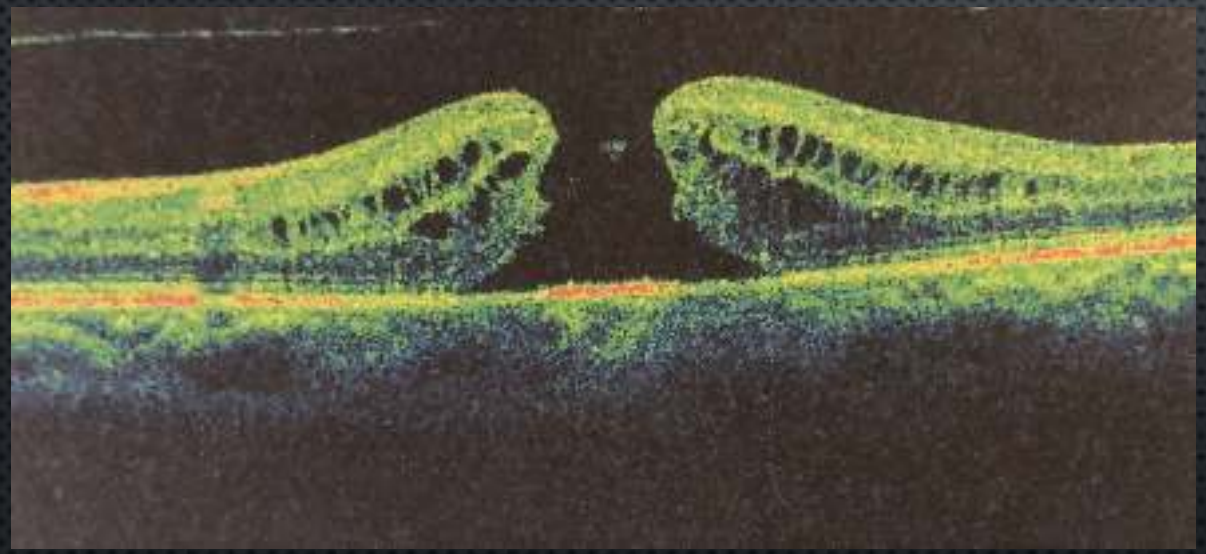


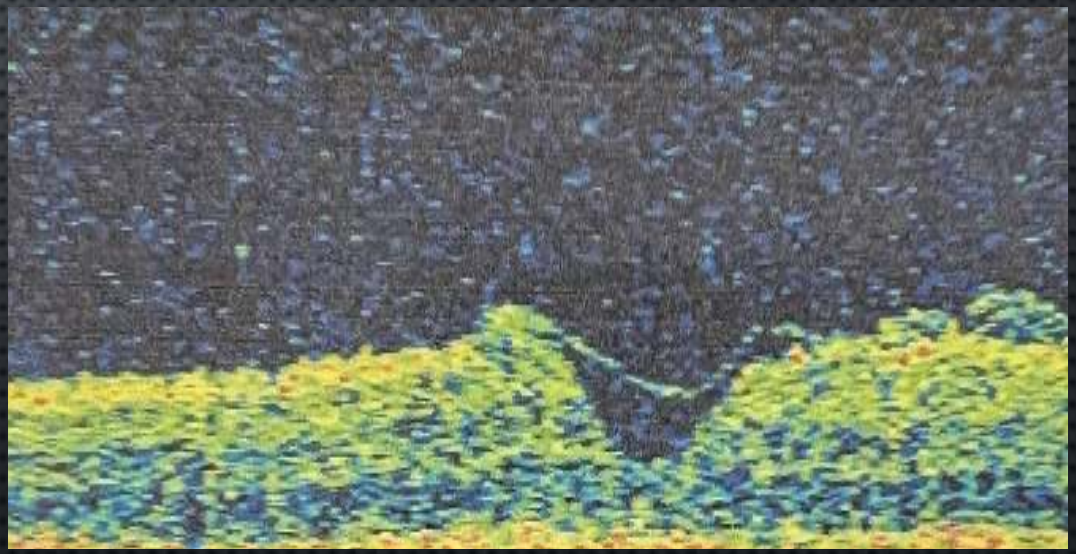


TEMPORAL ILM FLAP

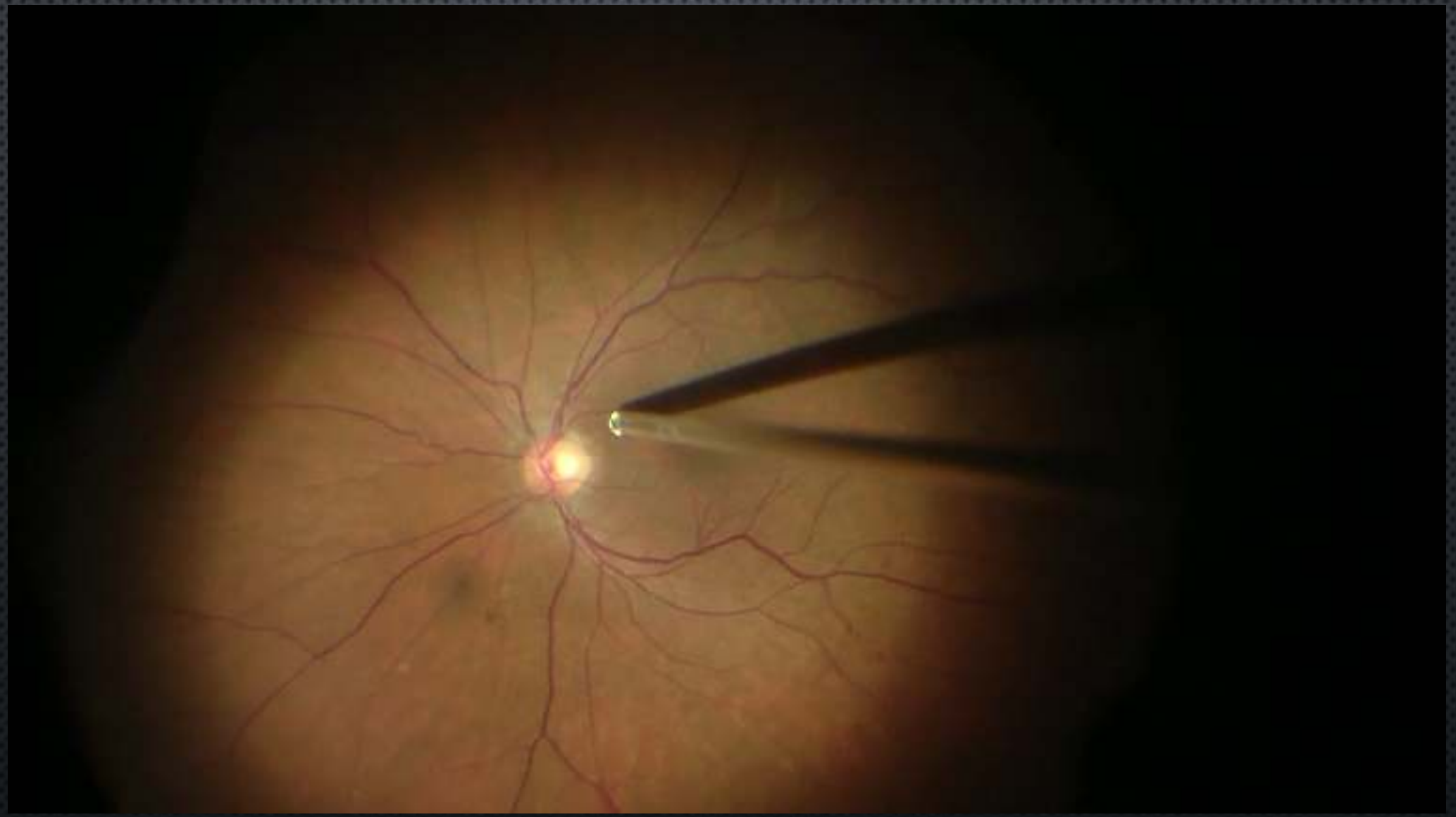


TEMPORAL FLAP

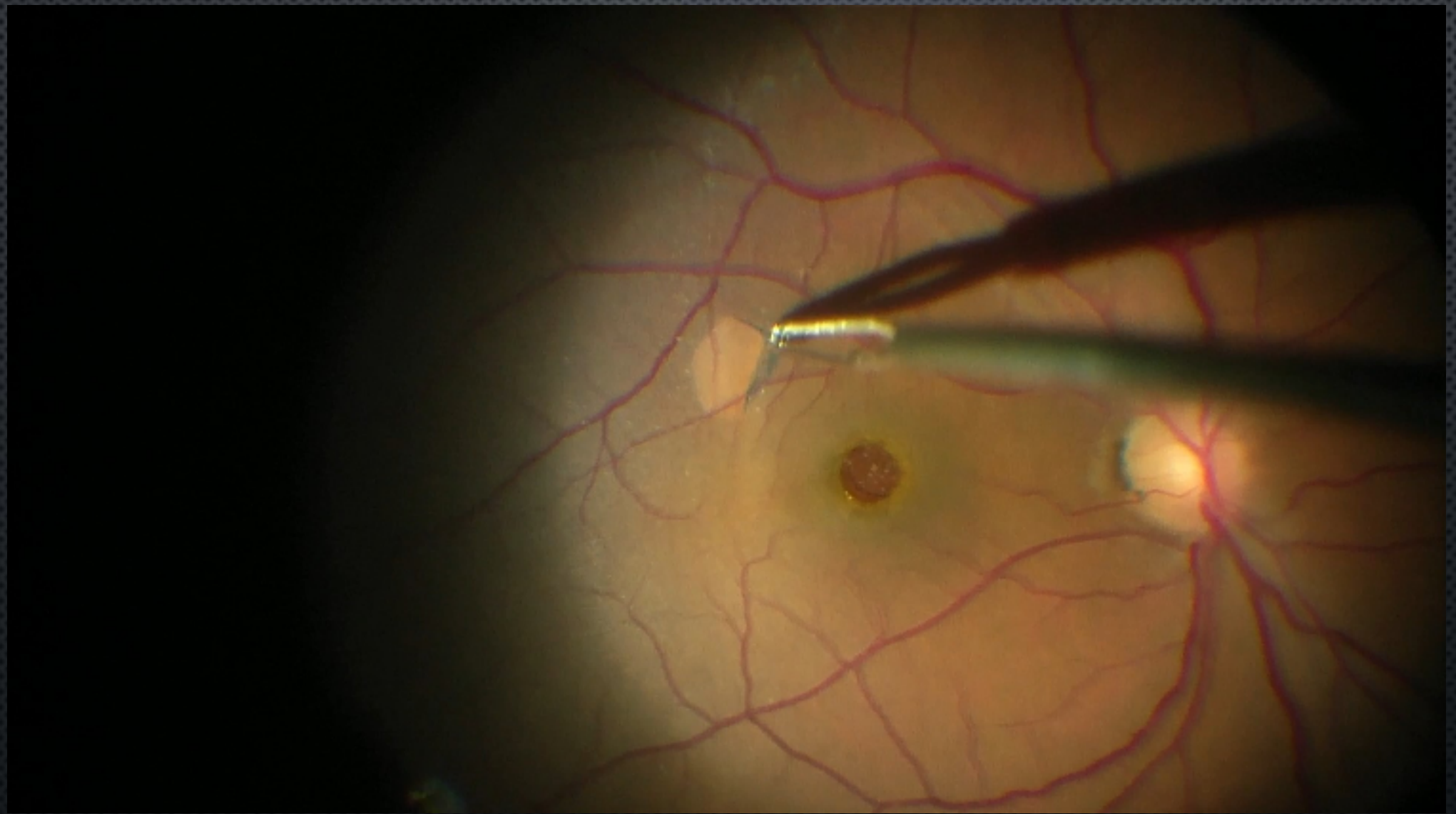




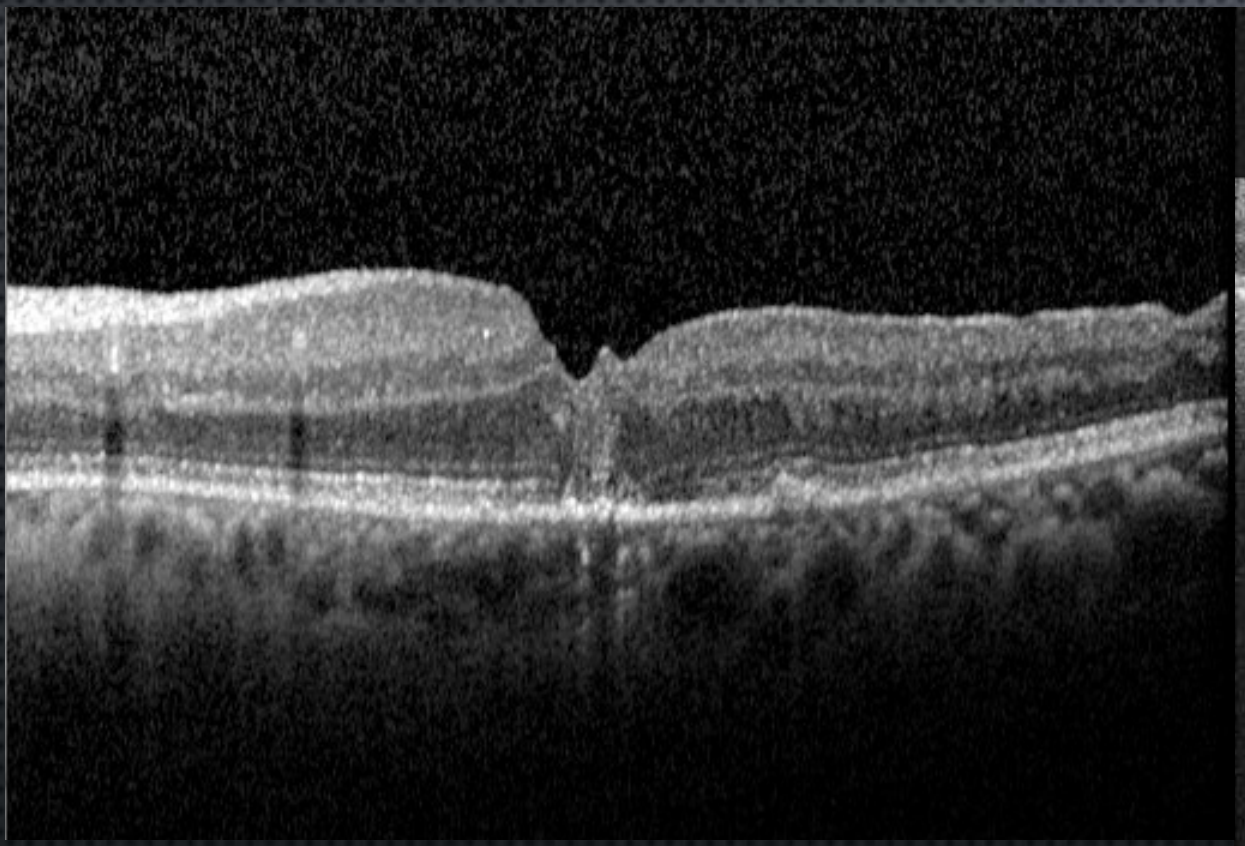
STABILIZE THE TEMPORAL FLAP WITH PFO



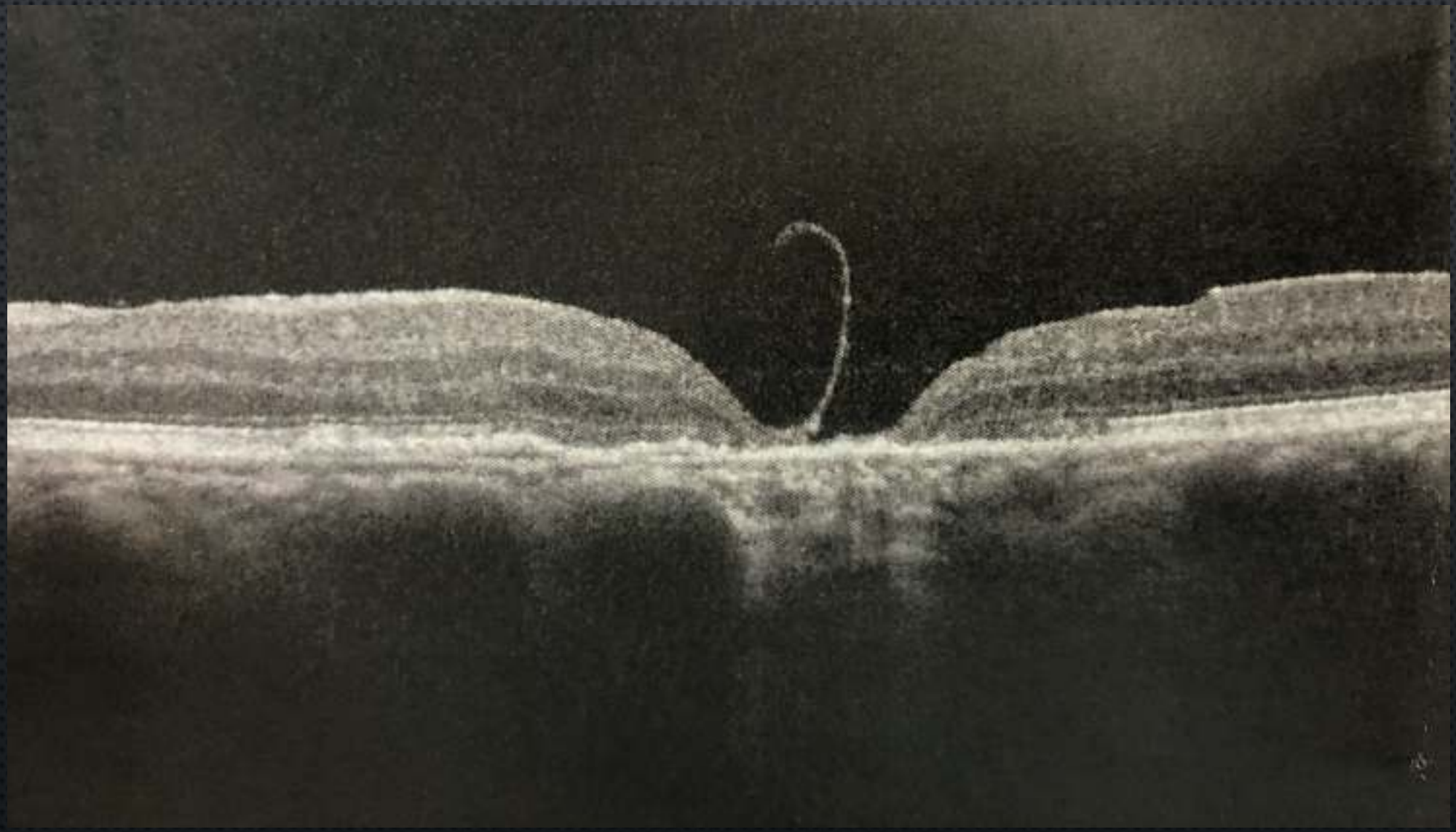
STABILIZE THE TEMPORAL FLAP WITH VISCO



PEEL AND INVERT VS PEEL AND COVER

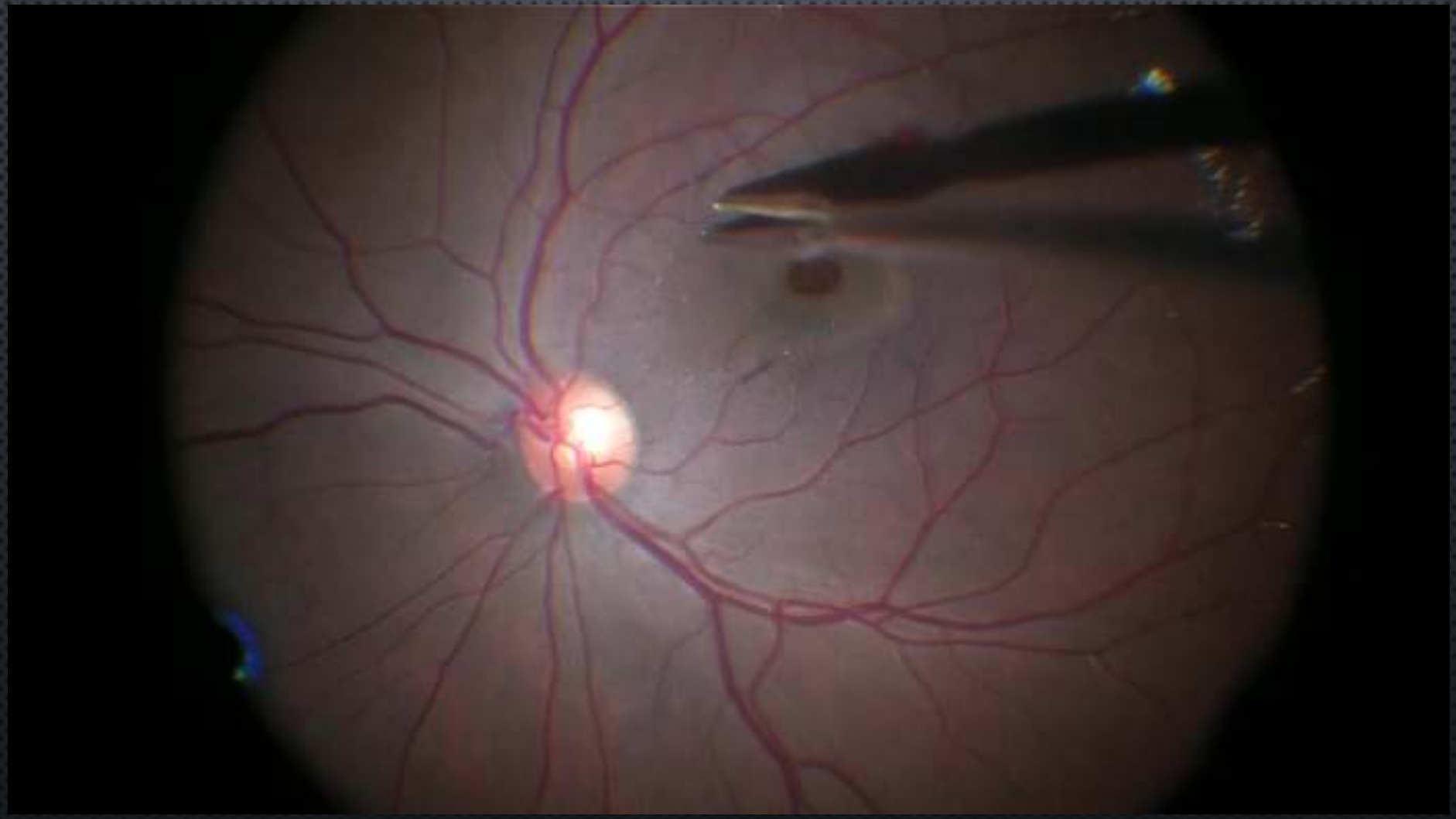


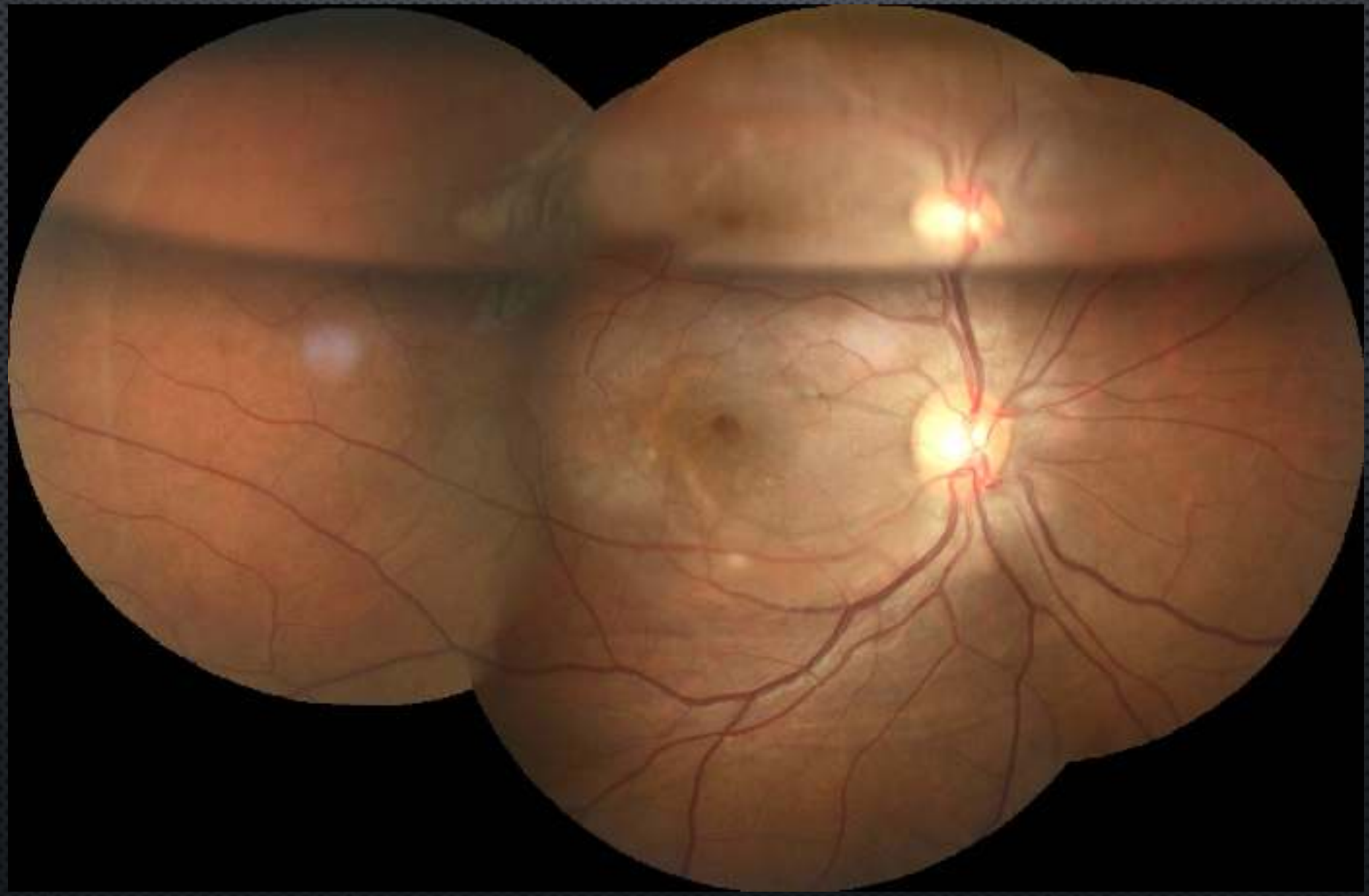
FAILED TEMPORAL ILM FLAP



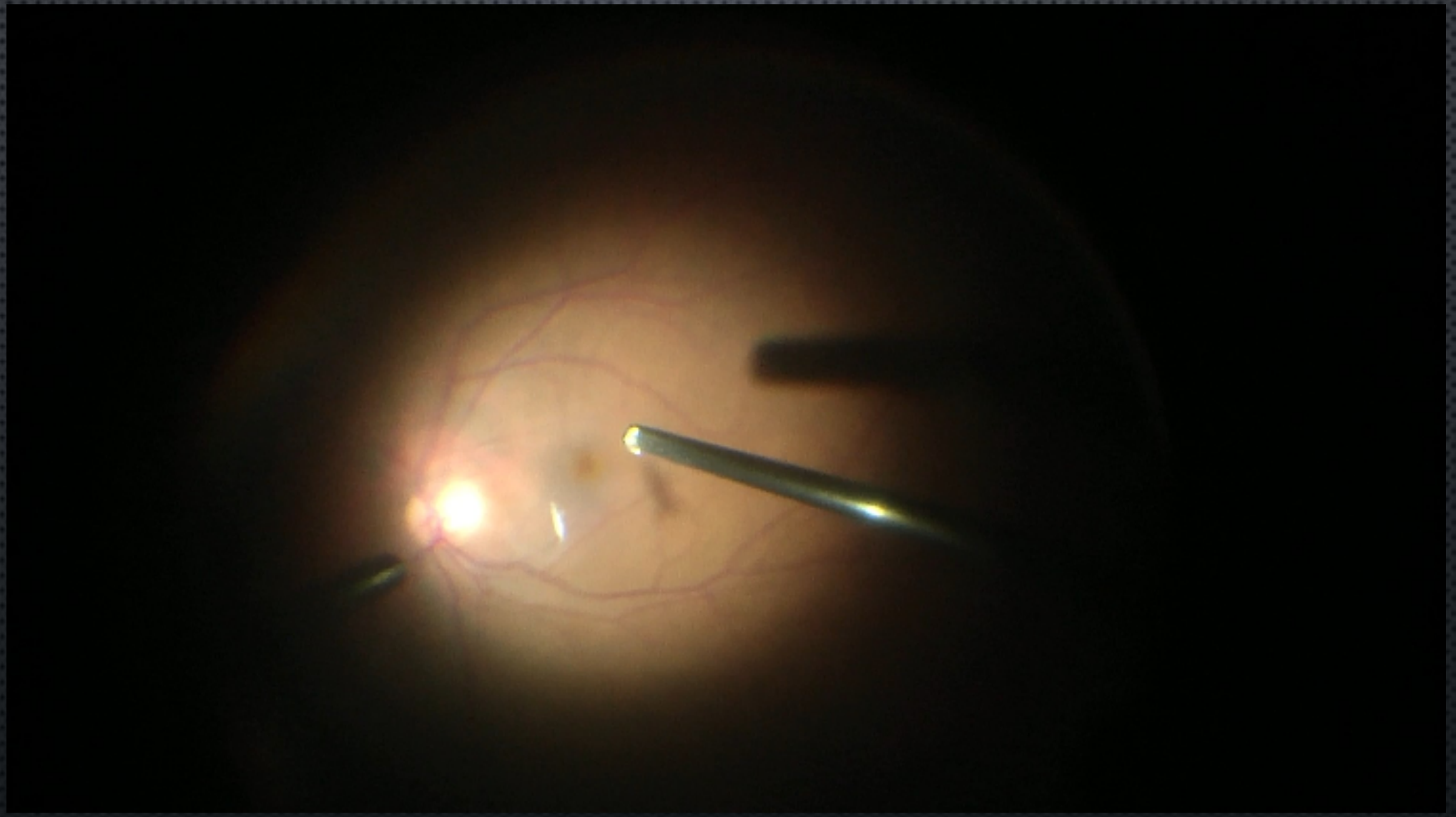
SUPERIOR HINGED ILM FLAP TECHNIQUE "SHIFT"

SHIFT

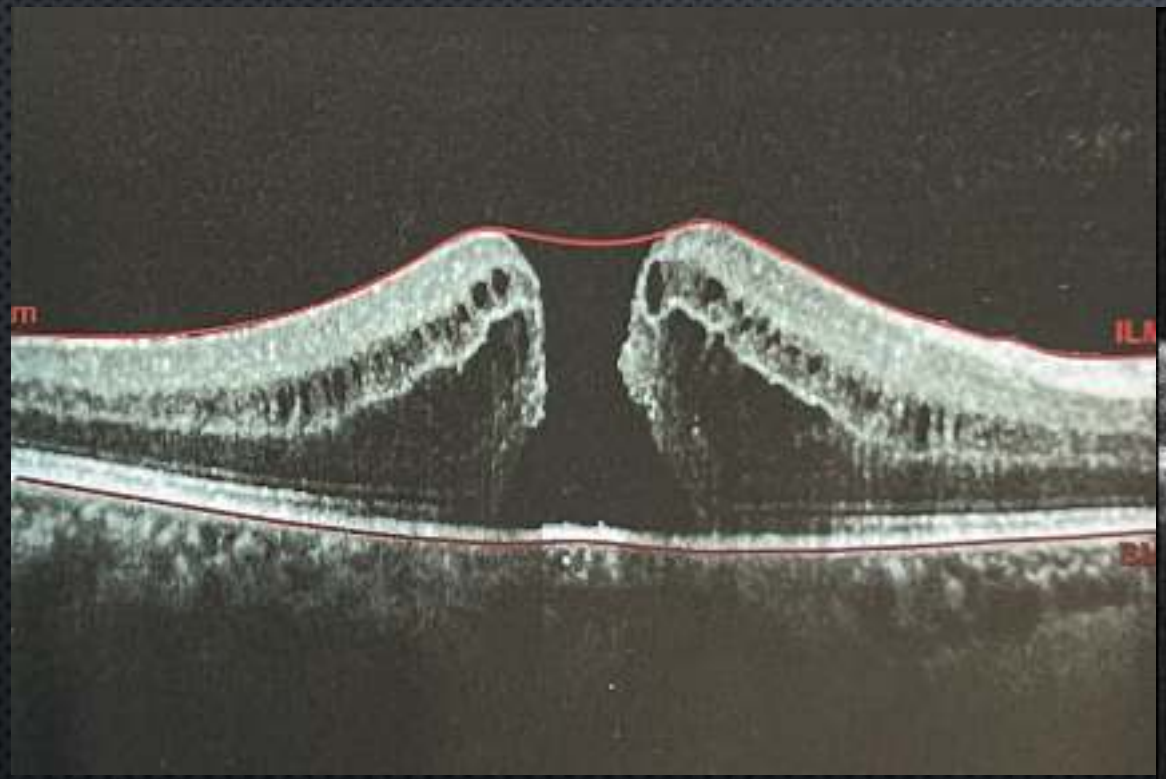


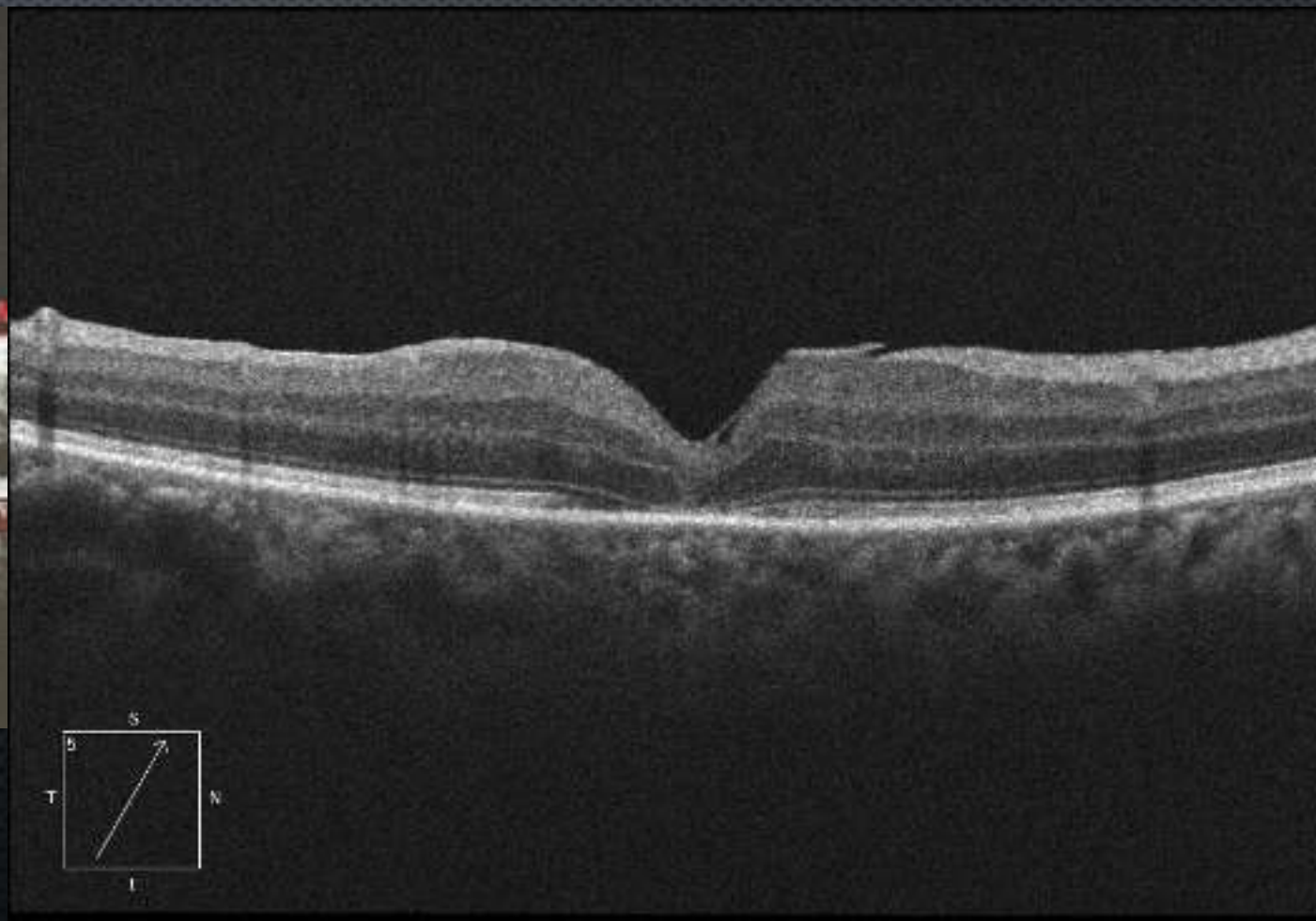


SHIFT



SHIFT





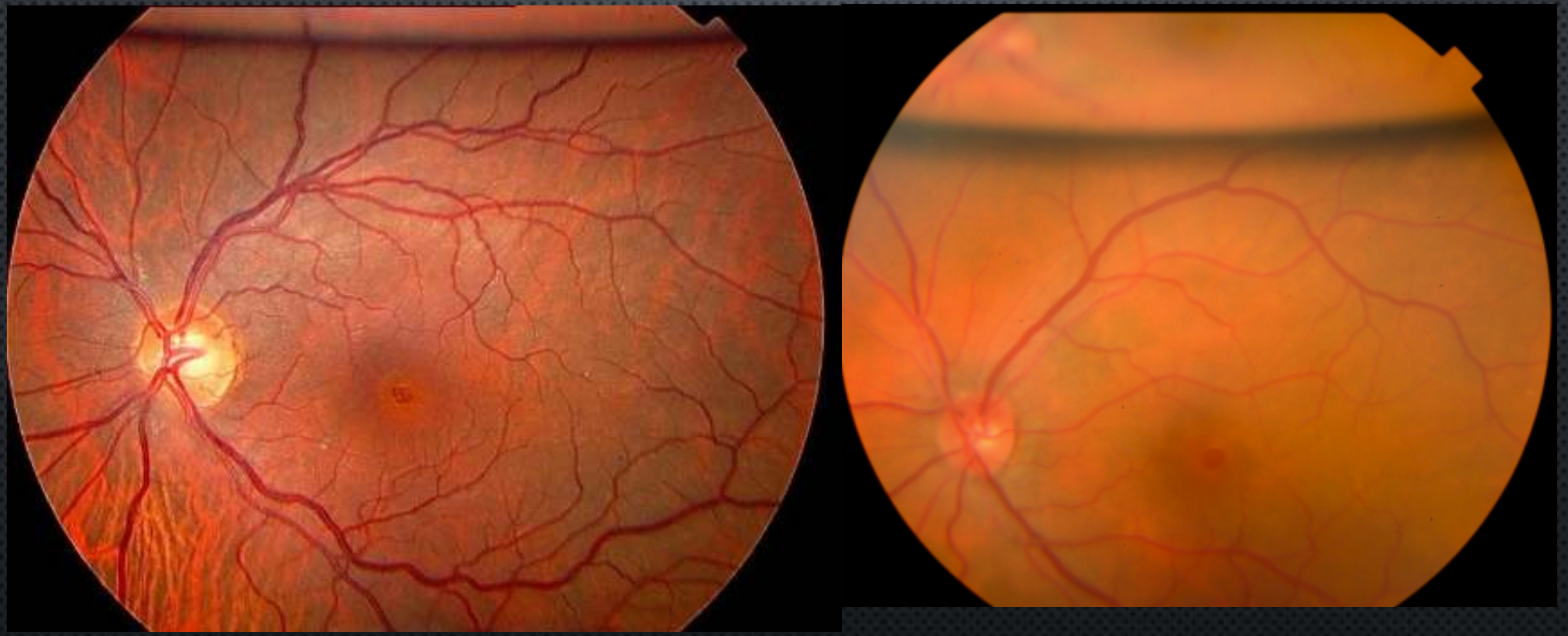
ADVANTAGES OF SHIFT

- Complete release of traction around MH facilitates anatomical closure.
- Covering the bare nerve fiber layer and RPE improves functional recovery.
- The superior hinged ILM flap tends to fall down by gravity and cover the hole with no chance for displacement.
- No loss of ILM and the flap can be repositioned postoperatively if needed.
- Less need for the use of gas or long posturing.
- Less potential dye toxicity as the stained side of the ILM is not in contact with the bare retina or the RPE at the base of MH.

RESULTS

- The Cover Group improved more than the Fill Group in terms of BCVA, retinal sensitivity and fixation stability.
- 4/14 (28.6%) in Fill Group gained a stable fixation by the end of the third month of follow-up.
- The ILM fill technique may be more suitable for large MH's (more than 600 u).

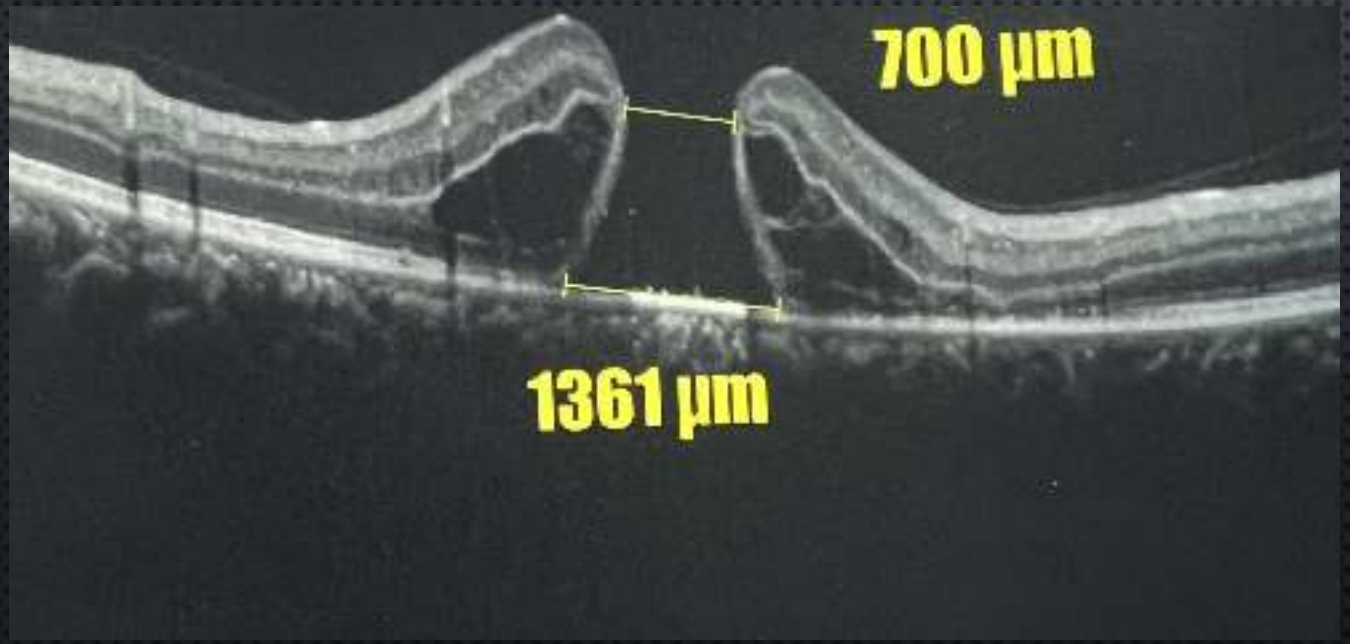
FAILURE OF HOLE CLOSURE

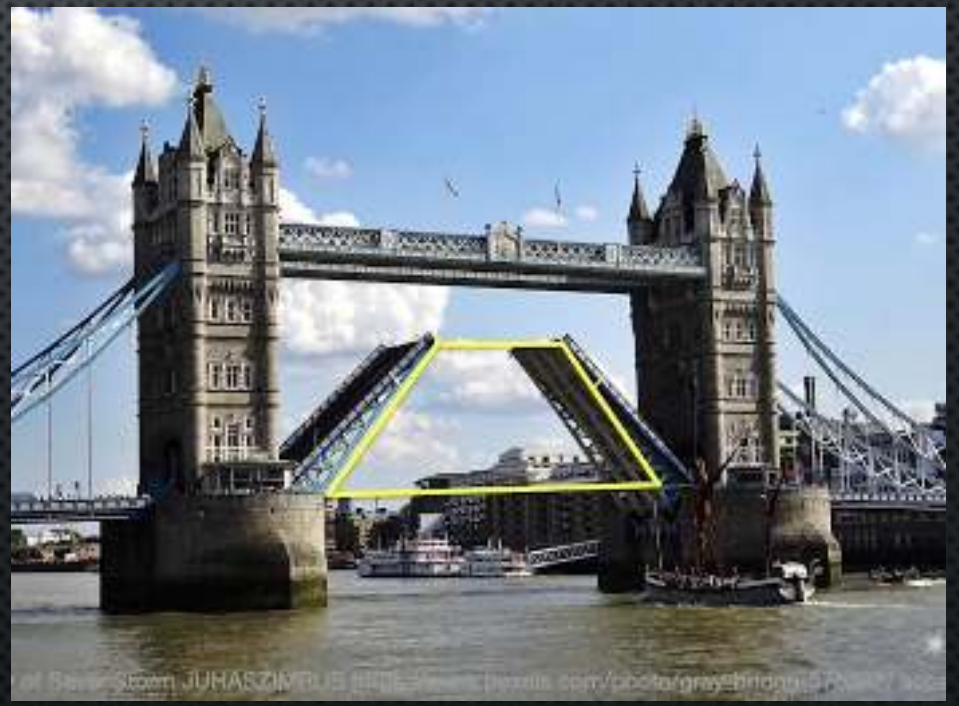


FAILED MH SURGERY

- Either failure of hole closure after primary surgery or late reopening.
- Closure rate depends on hole size and chronicity.
- Causes :
  - Residual VMT.
  - Insufficient tamponade.
  - Non compliance to face down position.
  - Forces that impede edges approximation.

FAILURE OF HOLE CLOSURE

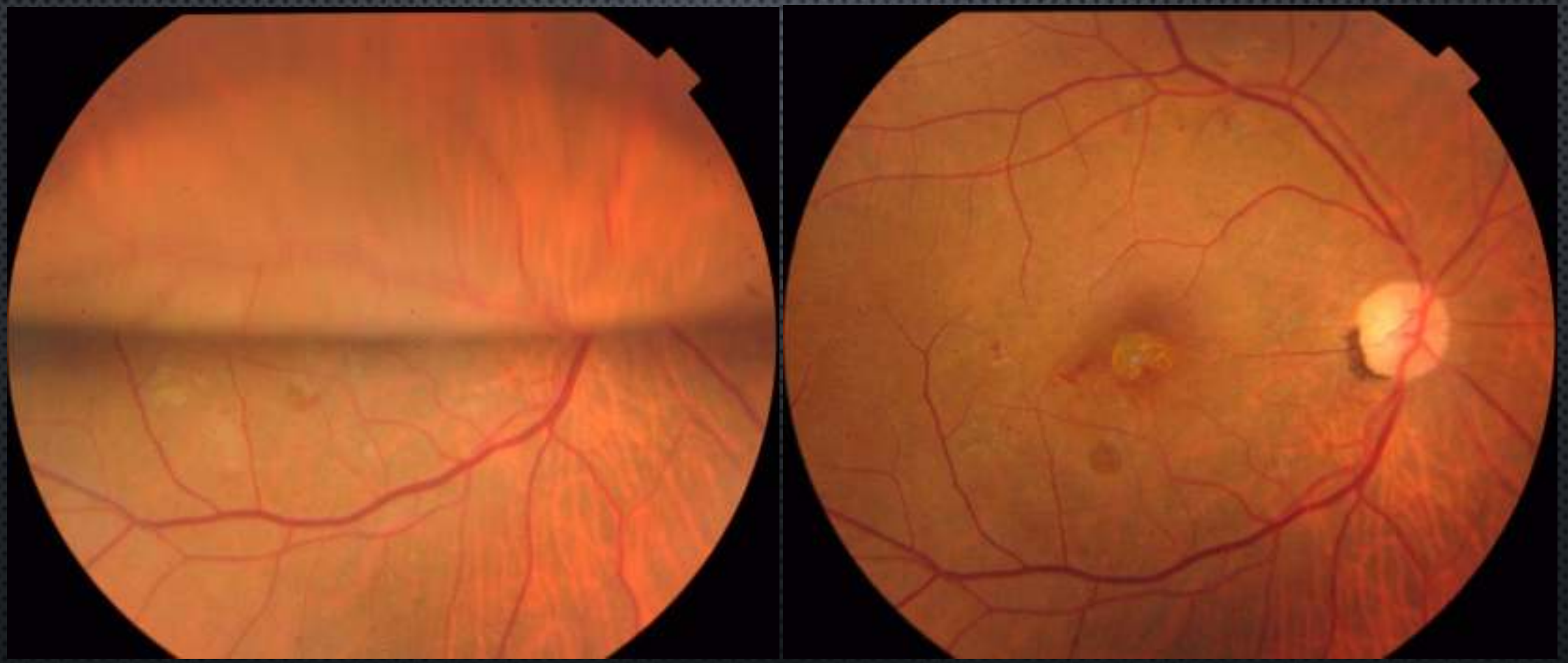




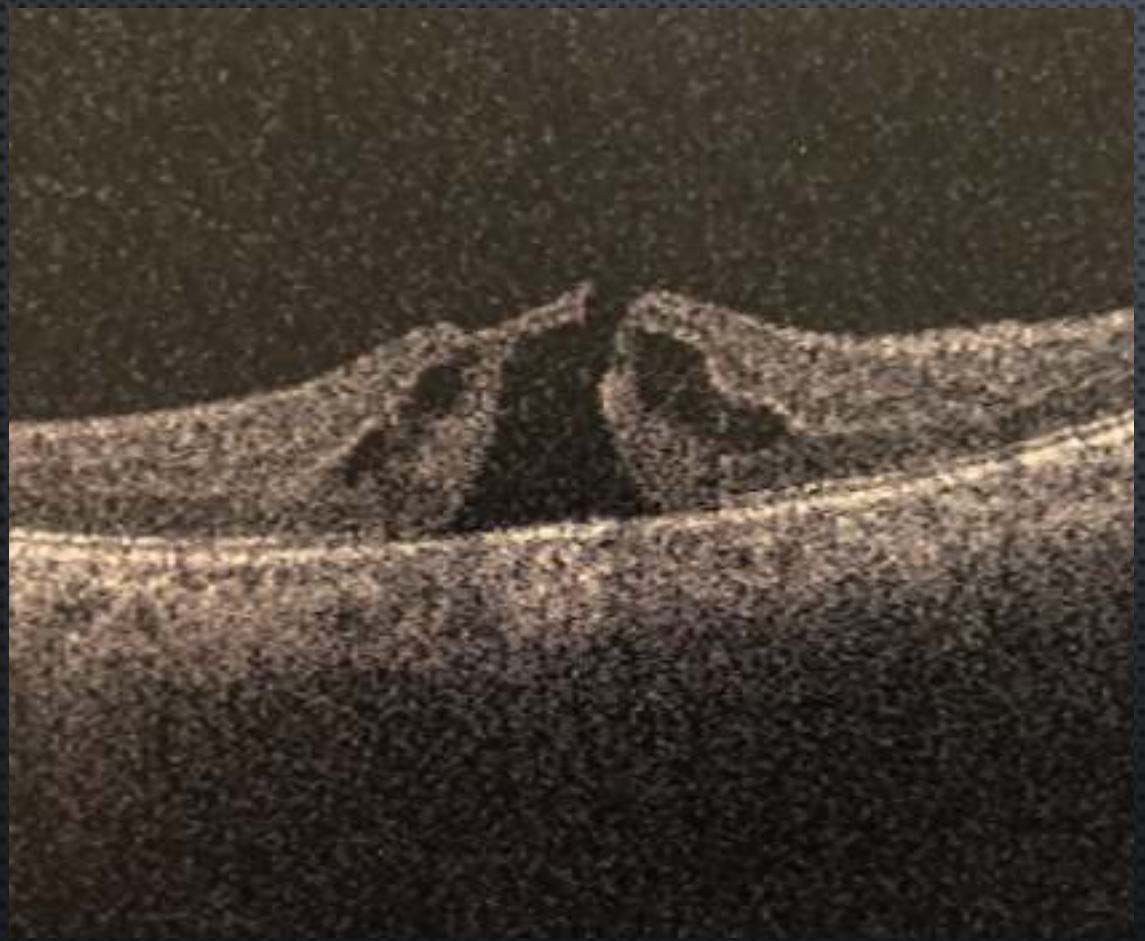
FAILURE OF CLOSURE OF MH "MANAGEMENT OPTIONS"

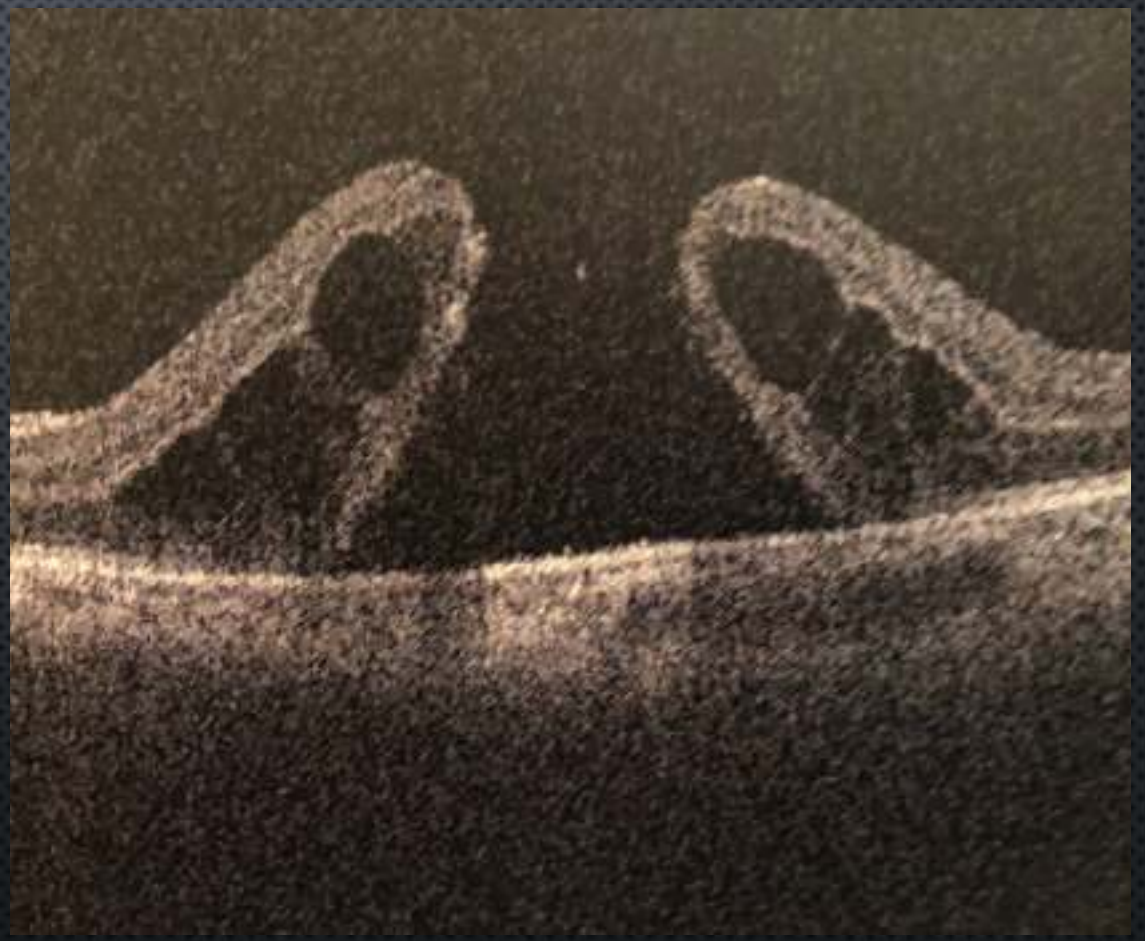
1) Revision of vitrectomy with long acting gas injection.
2) Revision of vitrectomy with retinal massage and aspiration through the hole.
3) Revision of vitrectomy with platelet concentrates (adjuvants).
4) Revision of vitrectomy with induction of central detachment.
5) ILM flap (hinged or free).
6) Lens capsule flap.
7) Descemet's membrane flap.
8) Tenon's membrane graft.
8) Amniotic membrane graft.
9) Autologous retinal transplant .

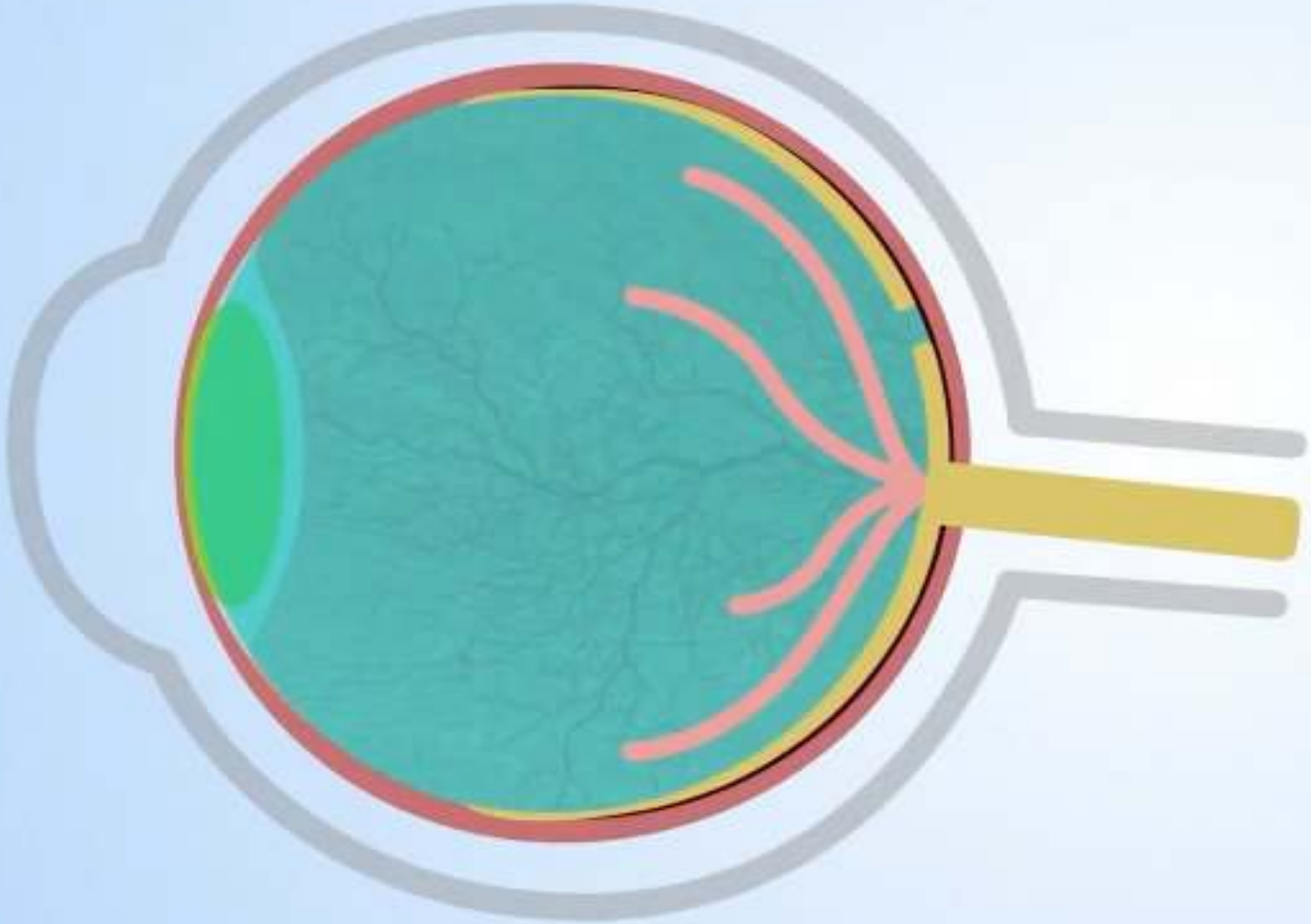
GAS AND POSITIONING



FAILURE OF CLOSURE OF MH (INDUCTION OF CENTRAL RD)

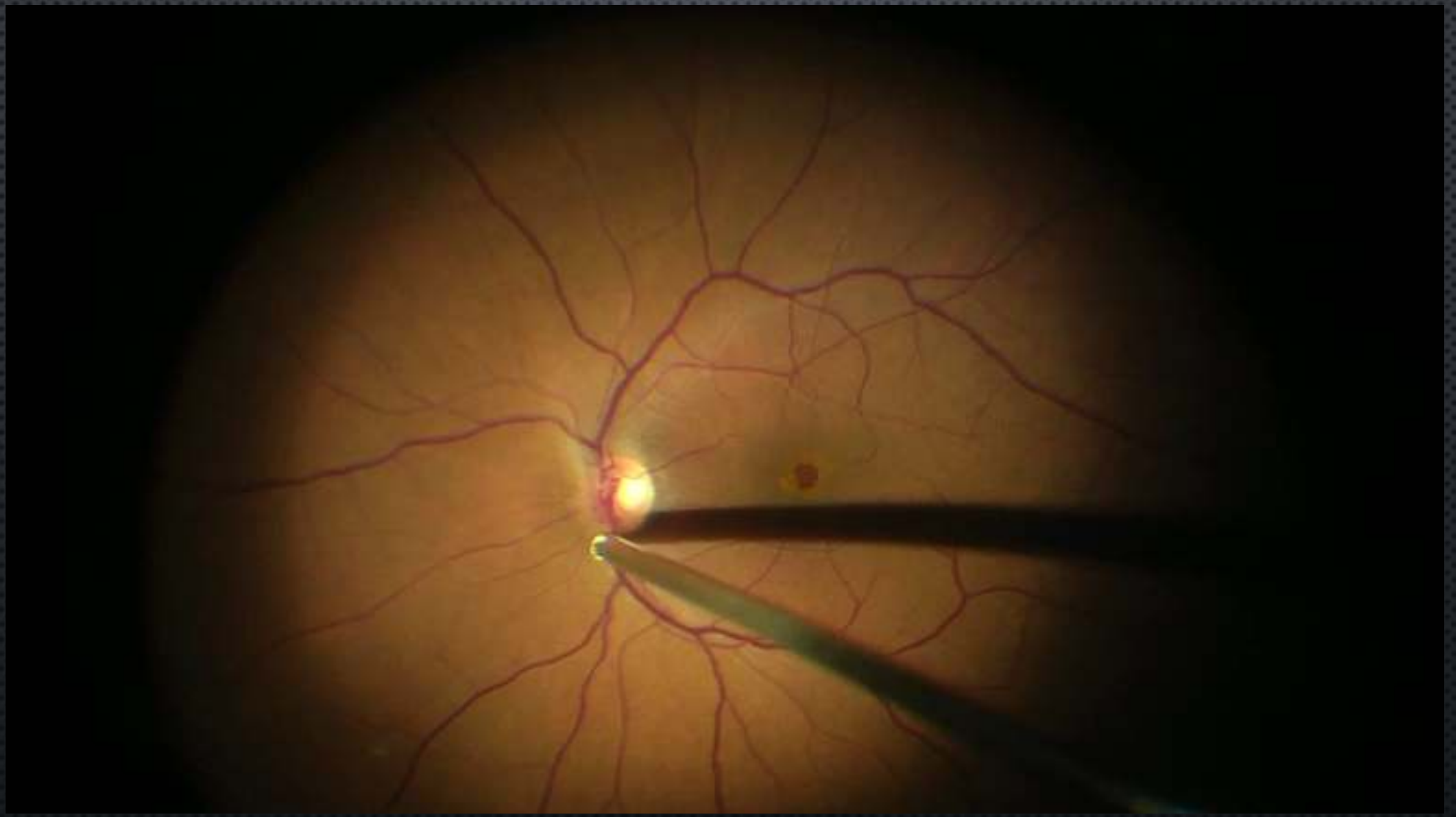




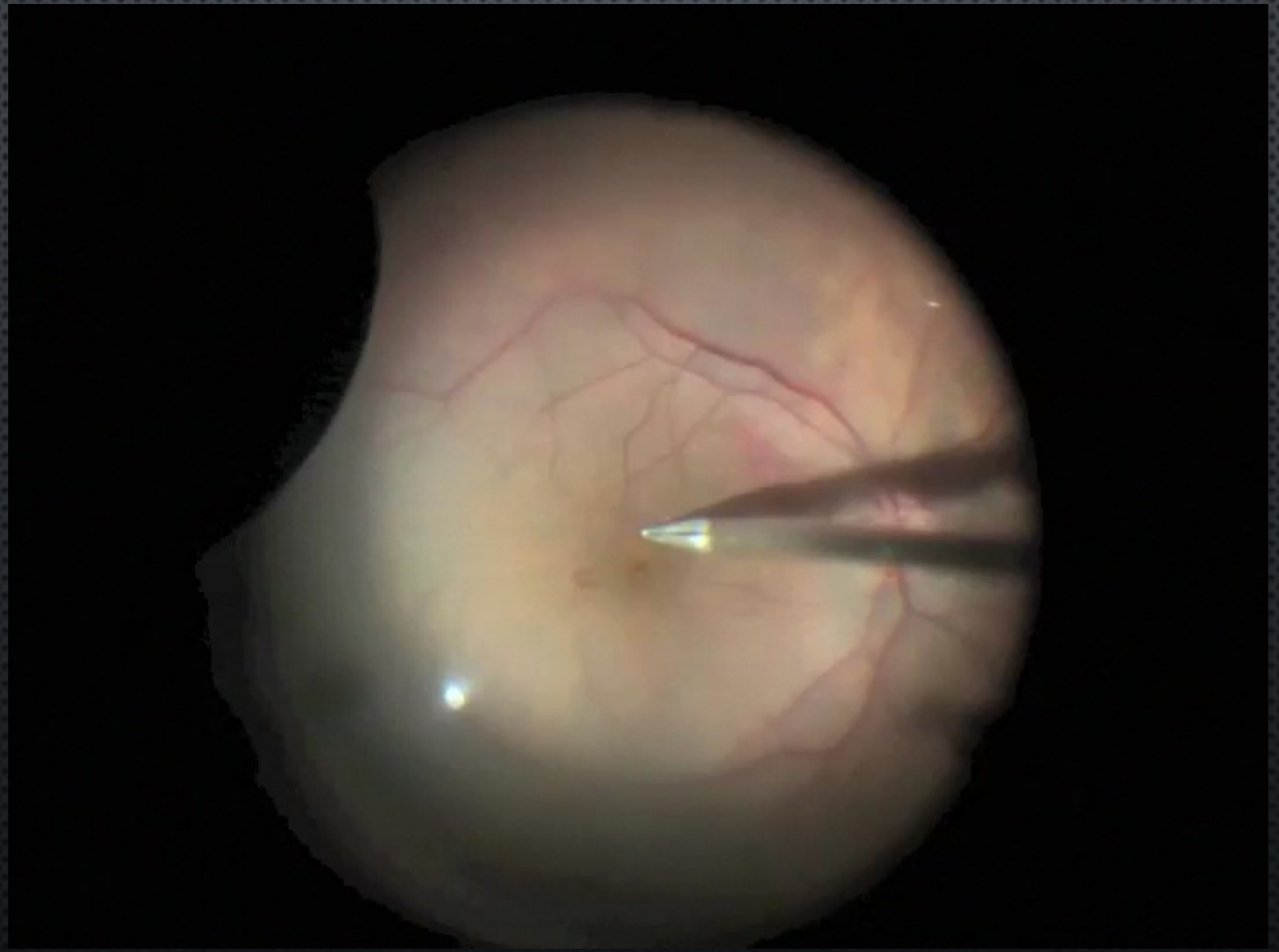


Meyer et al: subretinal fluid to close persisting macular holes

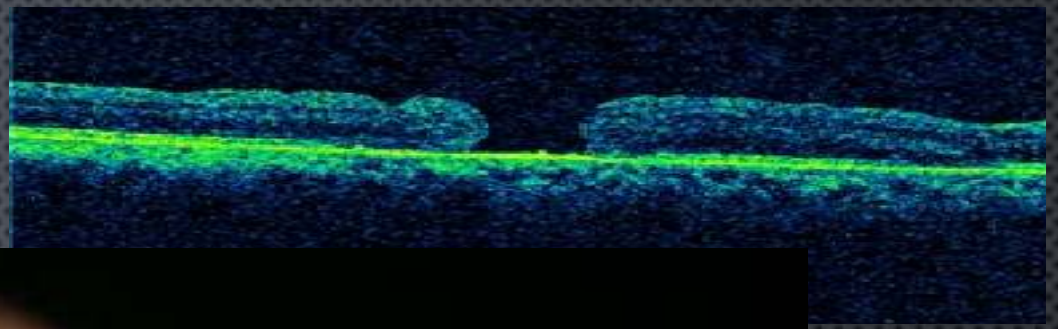
REVISION OF VTX WITH MULTILAYER ILM FLAPS



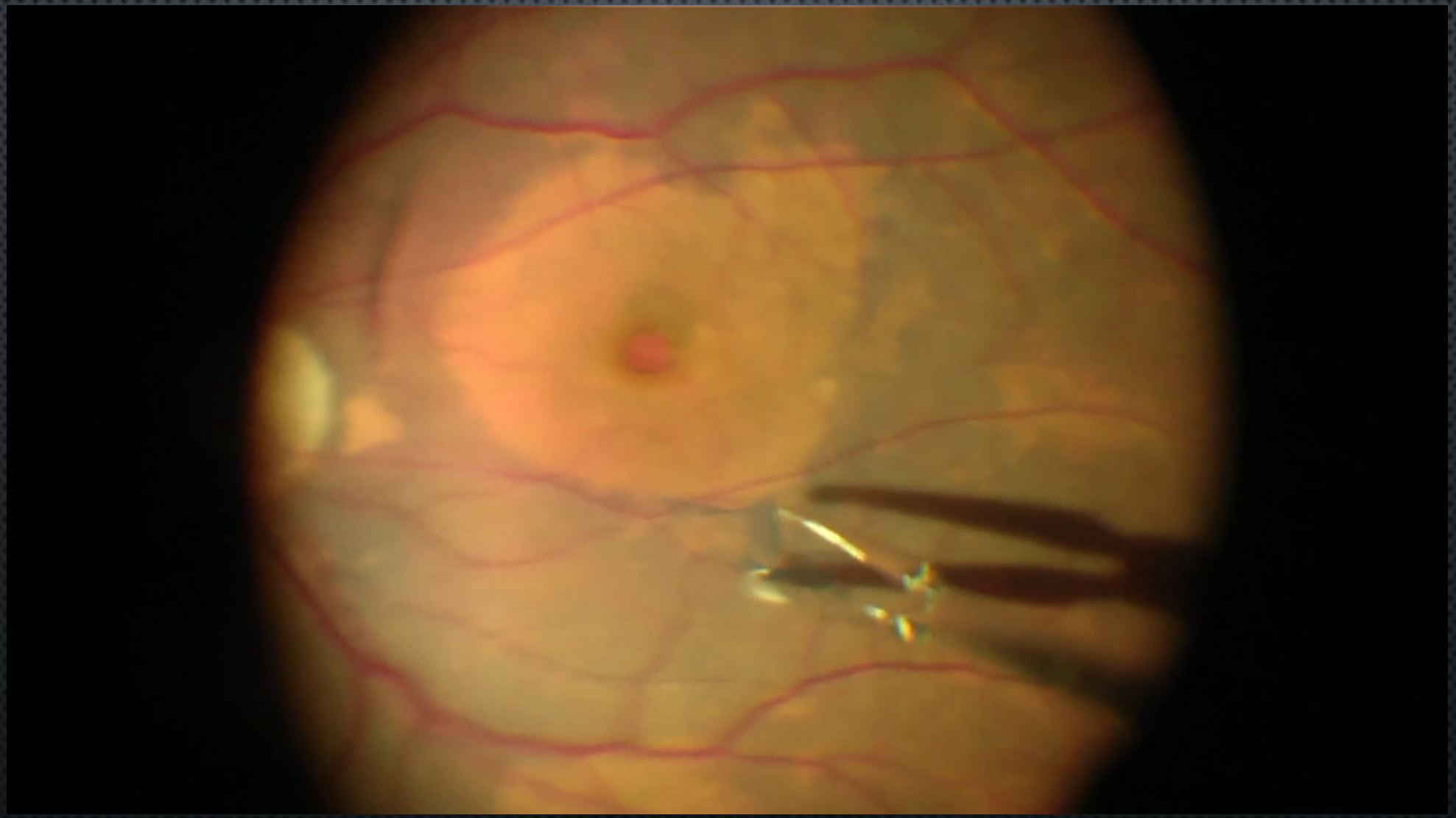
RETINAL MASSAGE



FAILURE OF CLOSURE OF IMH AFTER VTX WITH ILM PEEL

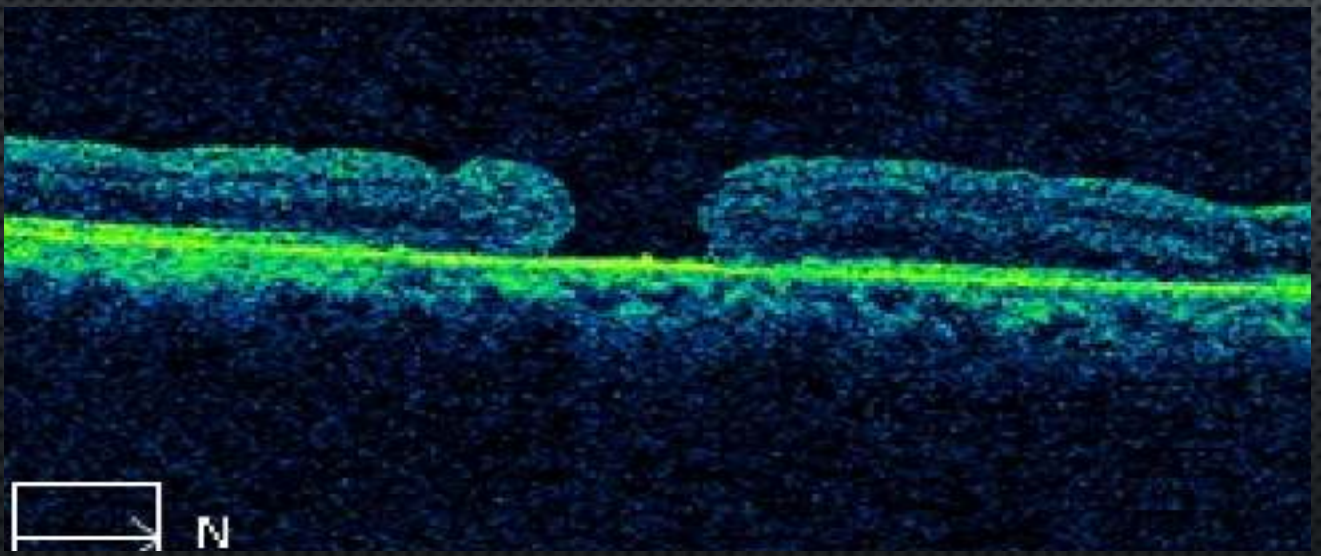


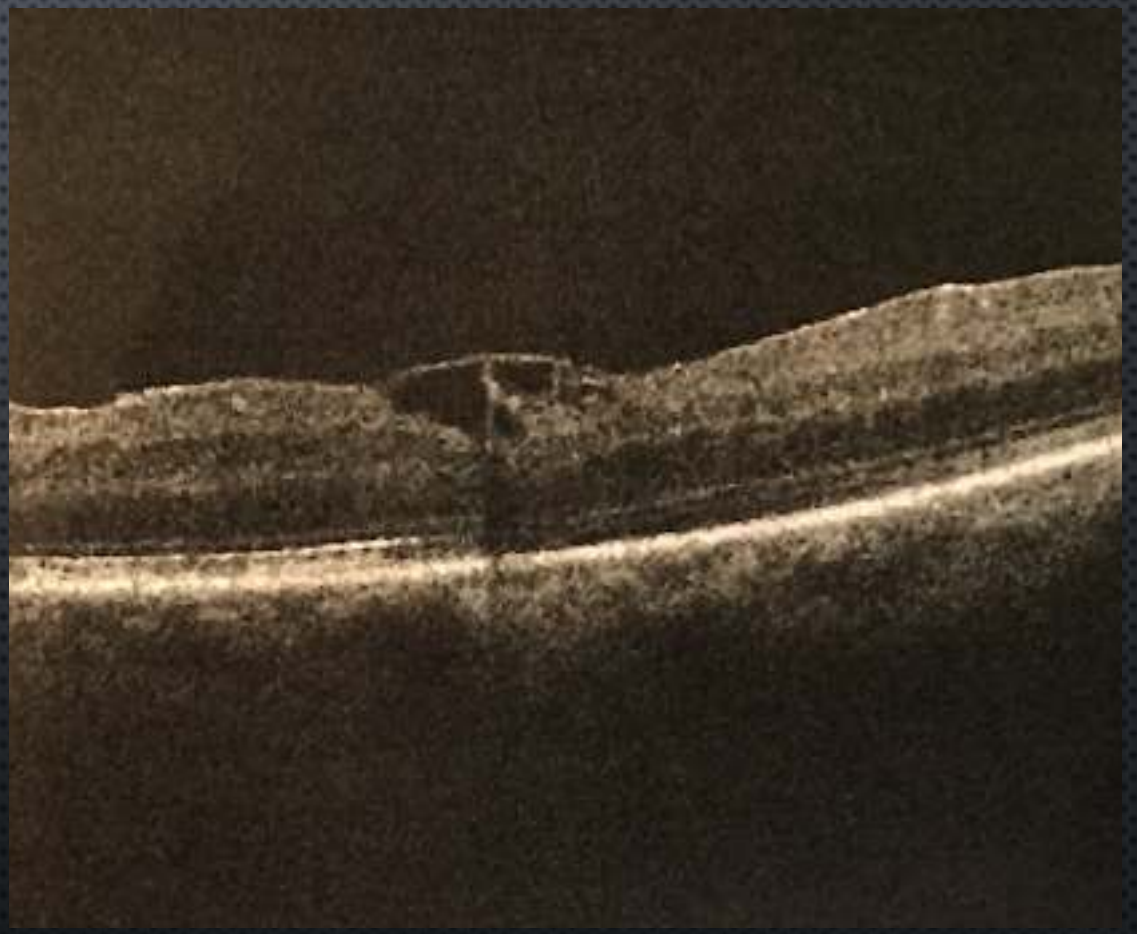
REVISION OF VTX WITH HINGED ILM FLAP



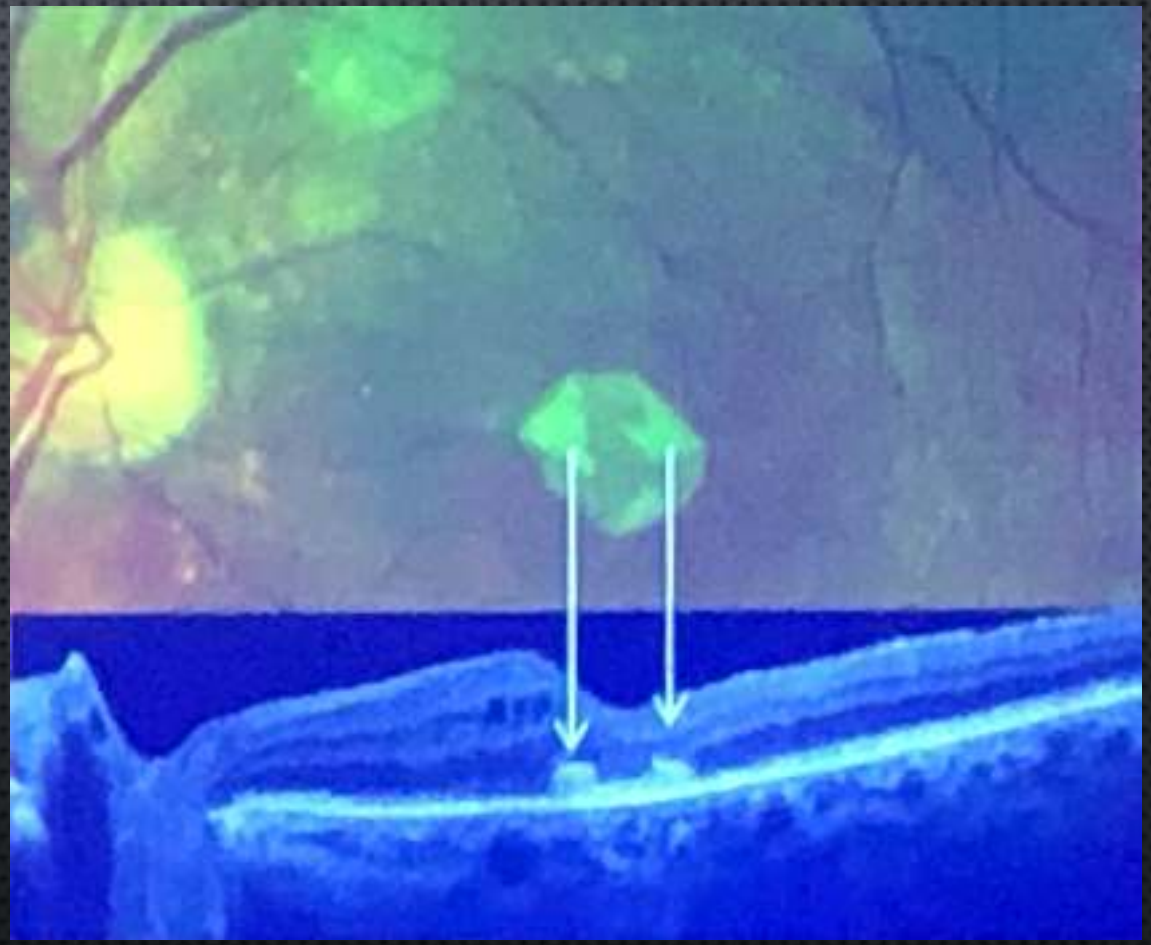
FREE ILM FLAP

PRE AND POSTOPERATIVE OCT'S

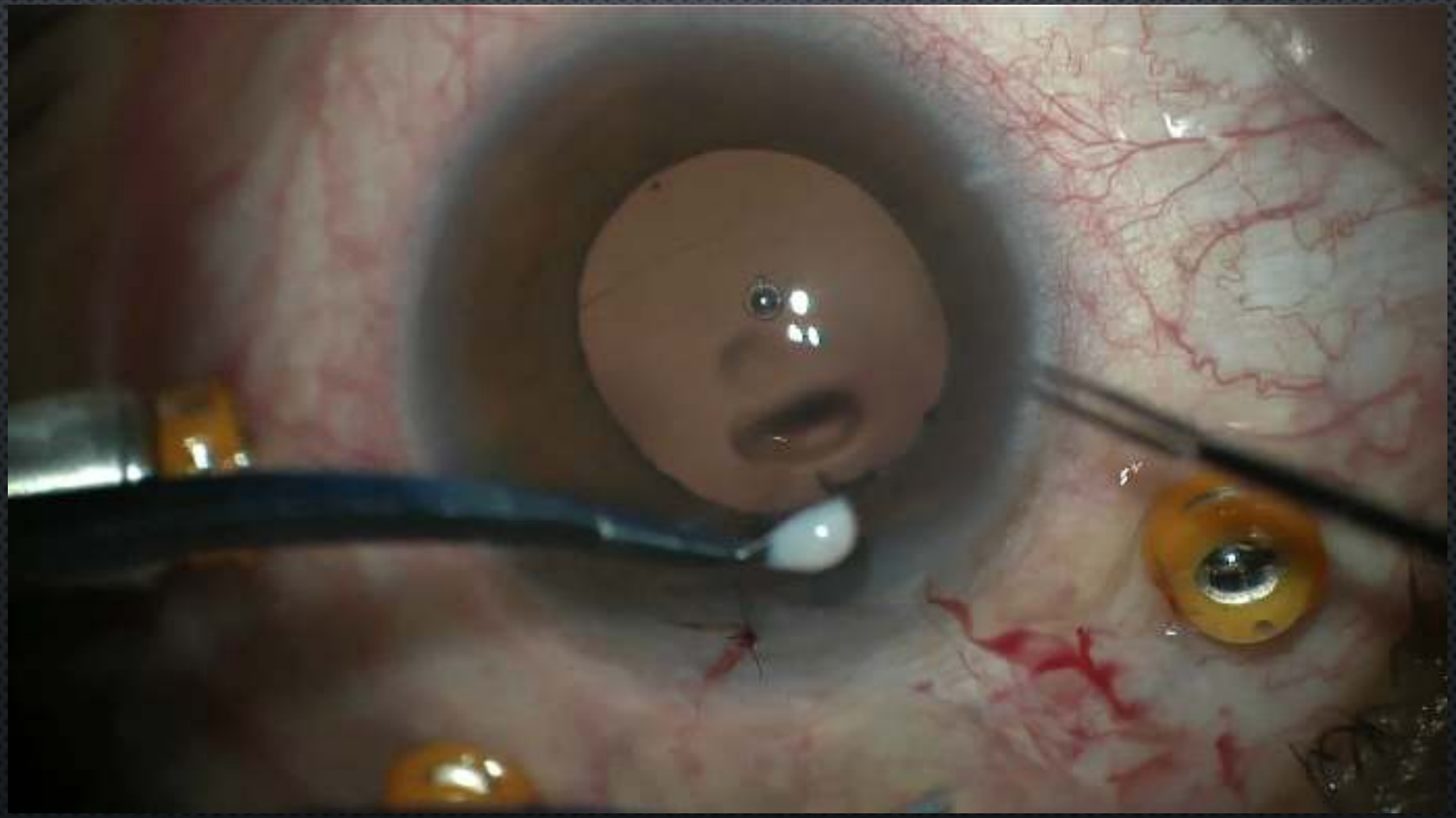




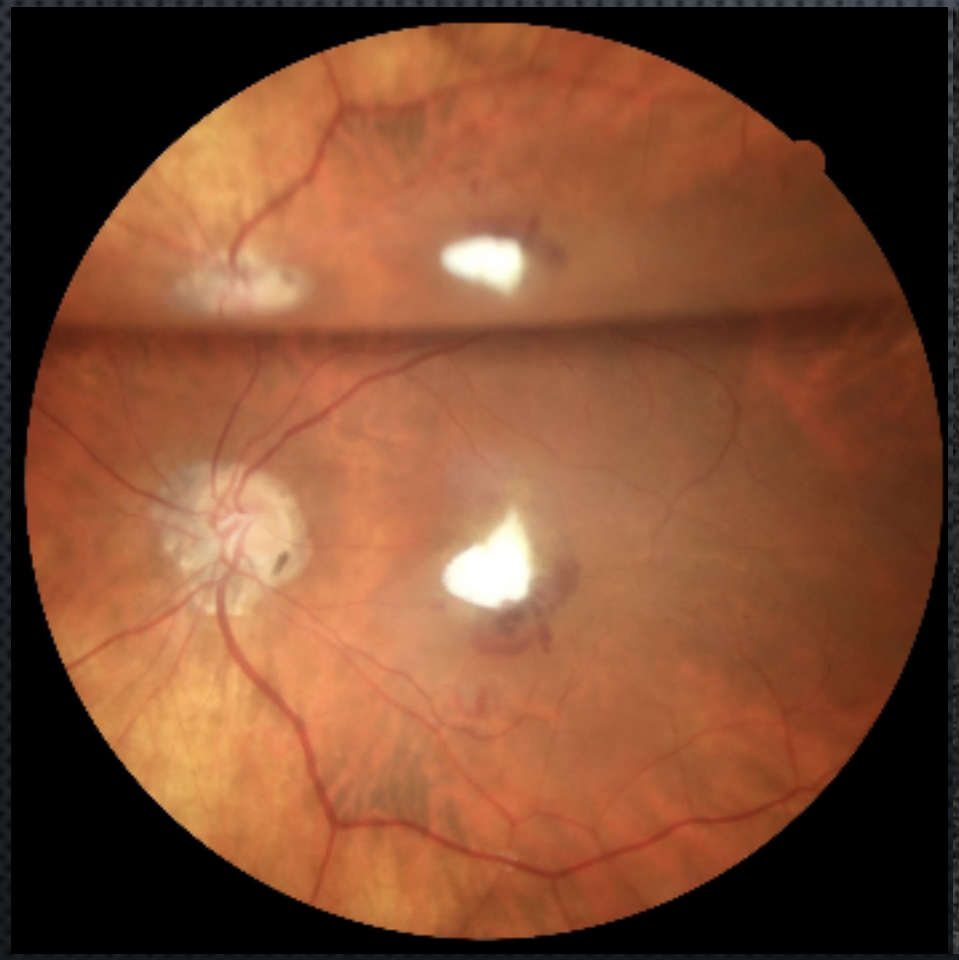
AMNIOTIC MEMBRANE PATCH (RIZZ0)
“FRESH OR FREEZE DRIED”

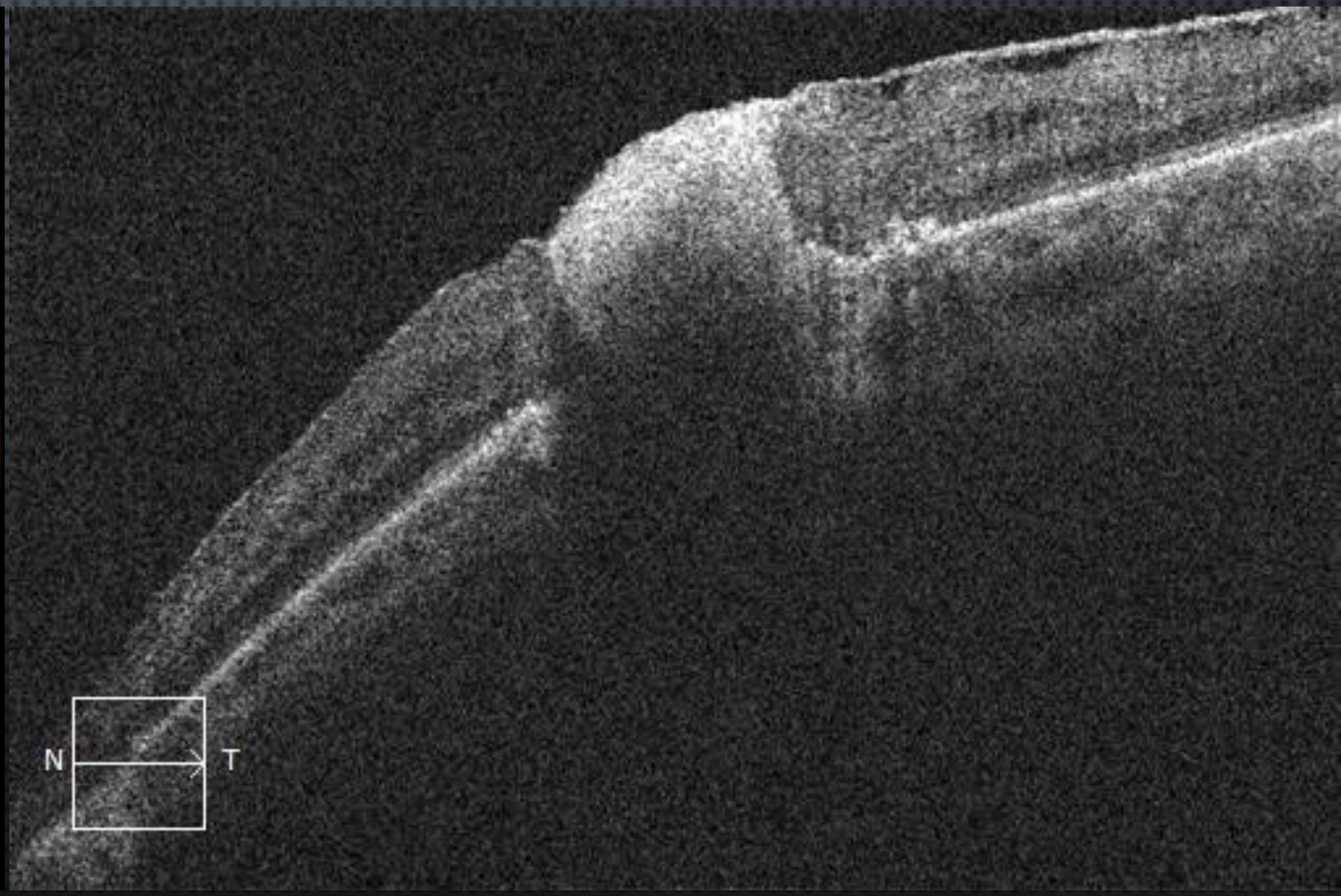


TENON’S CAPSULE GRAFT (REMZI)



TENON'S GRAFT

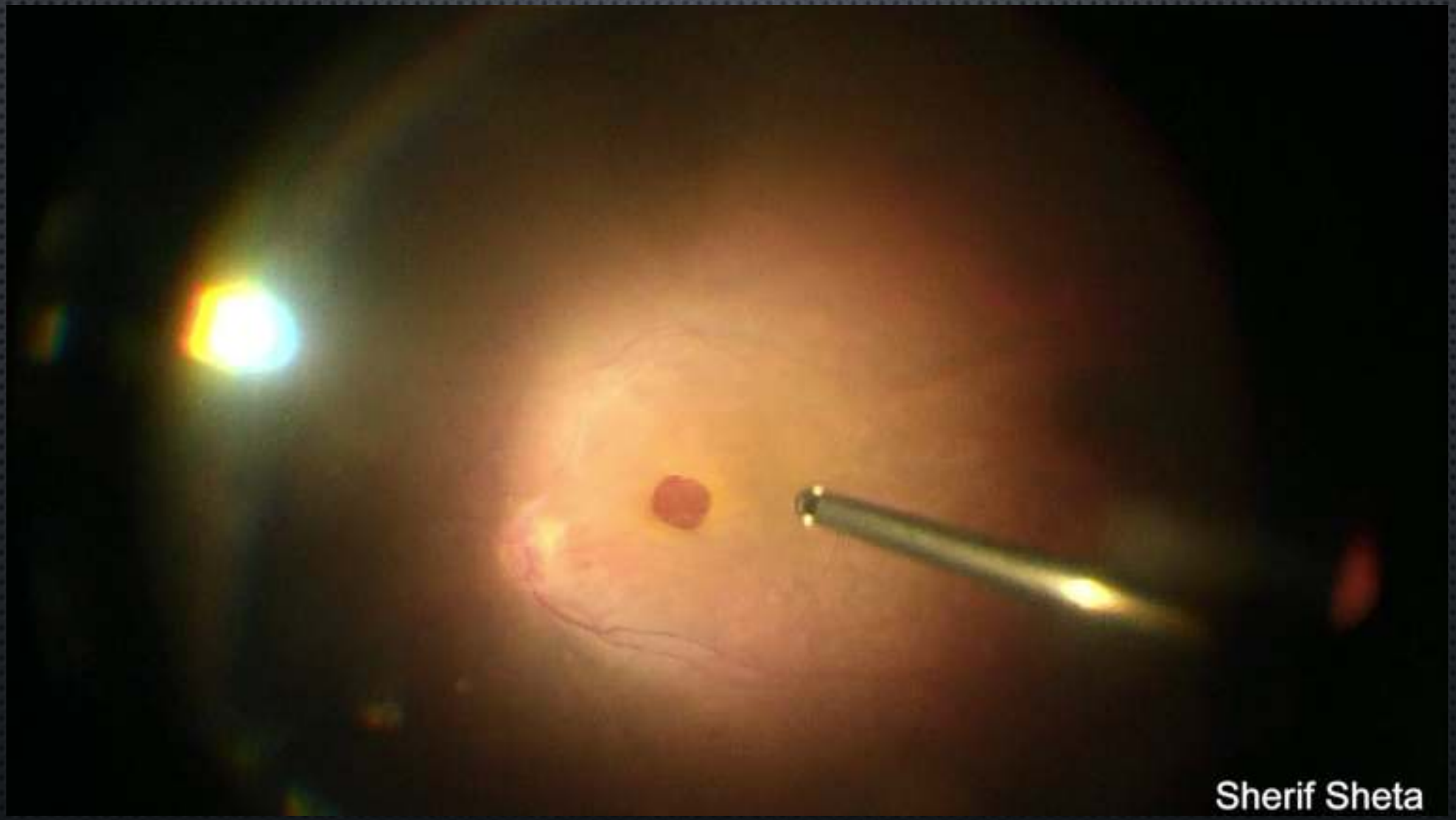




AUTOLOGOUS RETINAL TRANSPLANTATION ”ART” (MAHMOUD)

- Harvesting an autologous neurosensory retinal free flap and positioning it over the hole to provide a scaffold and plug to aid in hole closure (and may have a functional value).
- It is used for large, chronic and recurrent holes.

AUTOLOGOUS RETINA TRANSPLANT

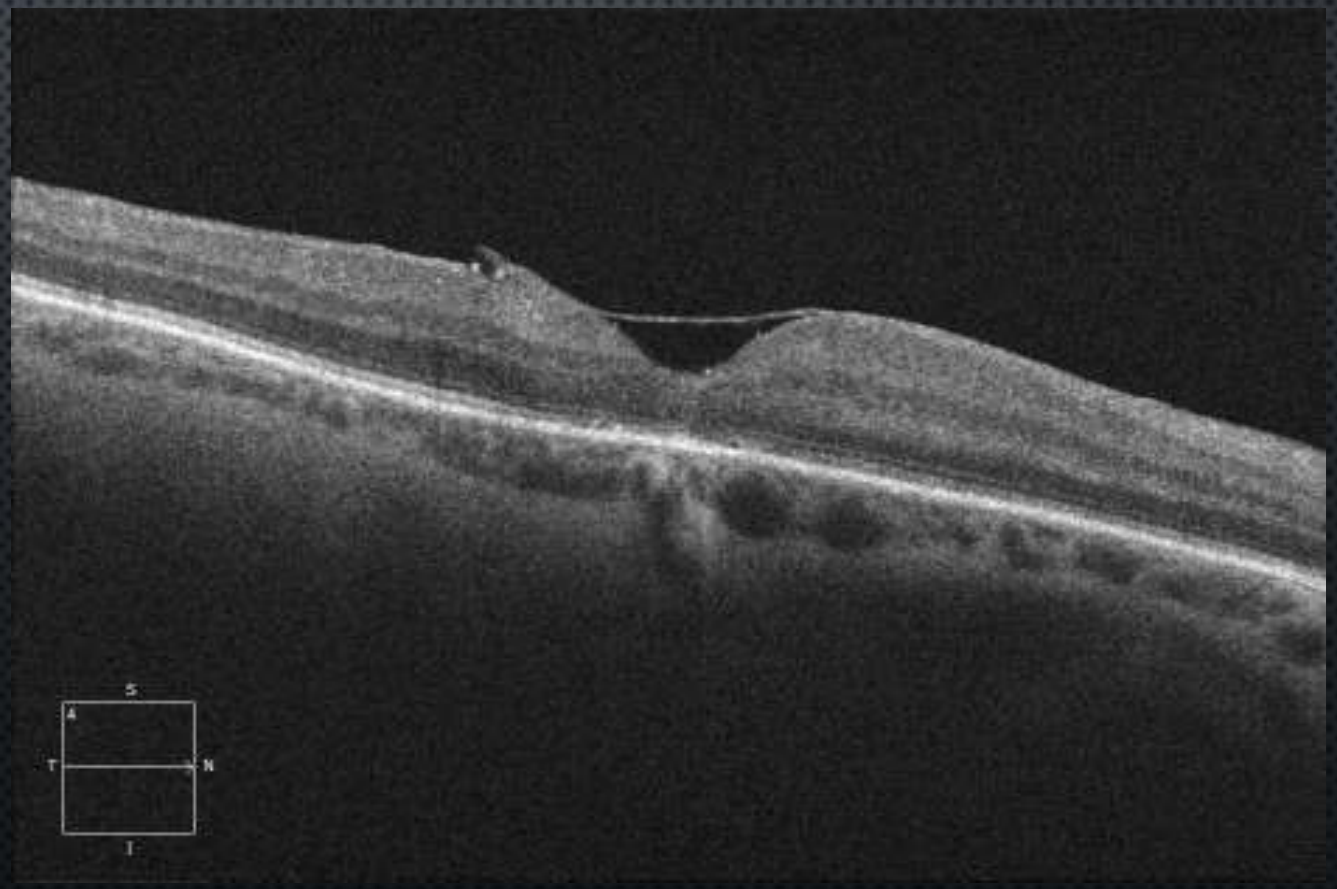


RESULTS (META ANALYSIS)

- REOPERATION FOR IMH'S THAT FAILED TO CLOSE AFTER PRIMARY SURGERY OR REOPENED AFTER BEING CLOSED RESULTED IN IMPROVEMENT OF VA IN MORE THAN HALF OF PATIENTS.
- REPEATED SURGERY IS LIKELY TO LEAD TO ANATOMICAL CLOSURE OF THE FTMH IN A HIGH PROPORTION OF PATIENTS.
- HIGH LEVELS OF VISION , HOWEVER, WERE UNCOMMON (LESS FUNCTIONAL)

THE JOURNY OF MH SURGERY OVER 35 YEARS

FROM A DISEASE THAT HAS NO TREATMENT TO A SUCCESS RATE NEAR TO 100%



"Progress comes from doing the unconventional"