COLORADO RETINA

PROUD MEMBER OF RETINA CONSULTANTS OF AMERICA

Clinical Crossroads:
Retinal Detachment-Management In Action

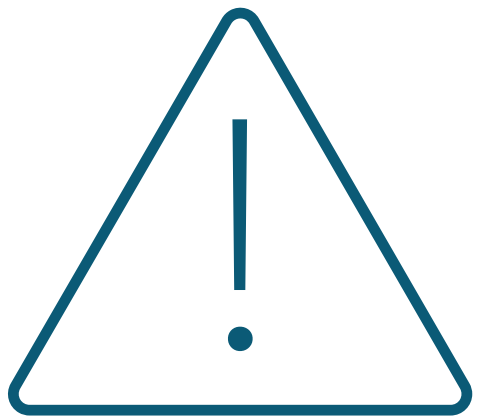
Curtis Hagedorn MD & Frank Siringo MD, OD

February 22, 2026

Mile High Masters of Retina

Financial Disclosures

We have no relevant financial relationships to disclose



The content and format of this course is presented without commercial bias and does not claim superiority of any commercial product or service.

Case: Urgent add-on, Friday 5pm

Referring doc:

- 55 y/o phakic patient
- Anticoagulated 2/2 pAF
- flashes/floaters
- inferior shadow
- Va 20/20 OU
- Exam:
  - PVD
  - Superior HST
  - Mac on RD.

Retinal detachment management

Treatment options

- Laser demarcation
  - Peripheral RDs
- Pneumatic retinopexy
  - Single superior break
- Vitrectomy
  - Pseudophakes
  - Multiple breaks
  - PVR

Wait, what are we missing???

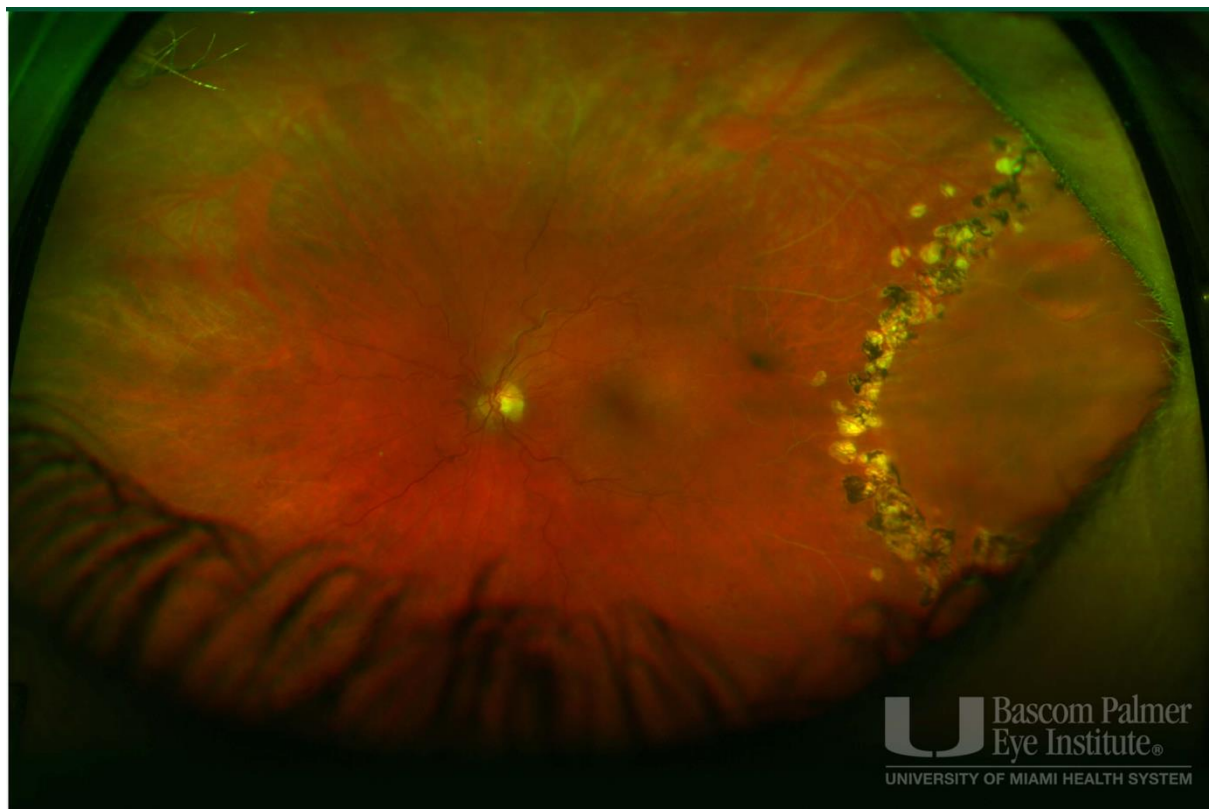
Scleral buckle!!!

- Flashback 2025:
- MHMR debate: Hagedorn v Siringo
  - PPV/laser/gas vs SB/cryo for RD
    - young phakic high myopes with no PVD
- PPV won by single vote
- Due to bitterness by the loser, not covering primary buckles today
- Let us proceed

Retinal detachment management

Laser Demarcation

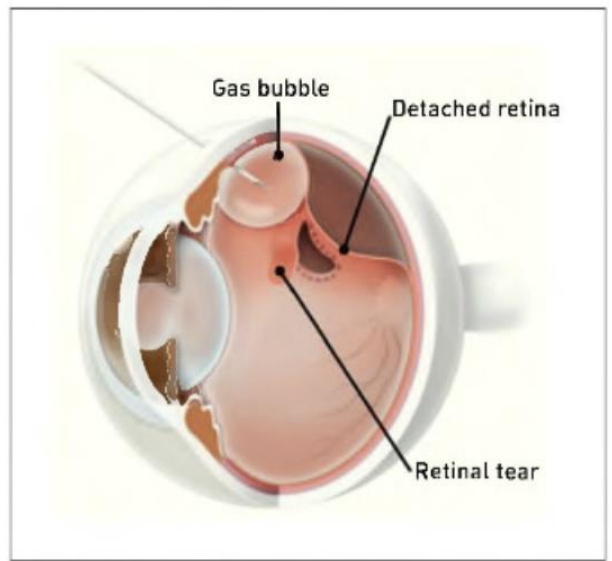
- Goal: provide a barrier of laser retinopexy "walling off" the RD
- Pros:
  - Avoid OR
  - no altitude or positioning
  - Least invasive (no risk of infection)
- Cons:
  - Never "fixes" the detachment
  - worsens any VF loss
  - risk of breakthrough
  - risk of ERM



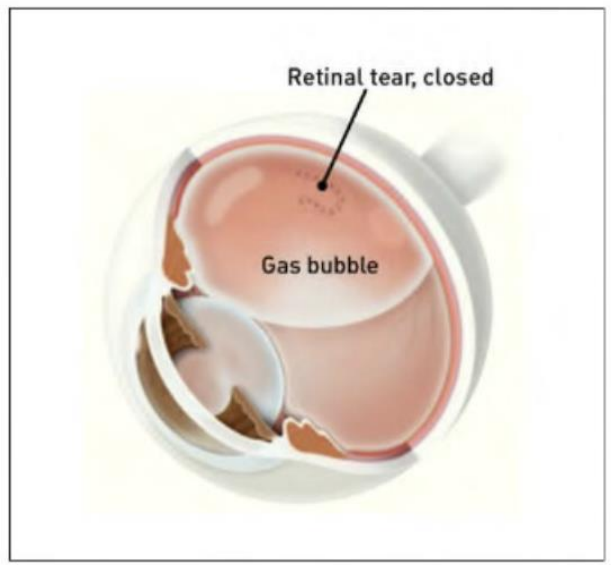
Retinal Detachment Management

Pneumatic retinopexy

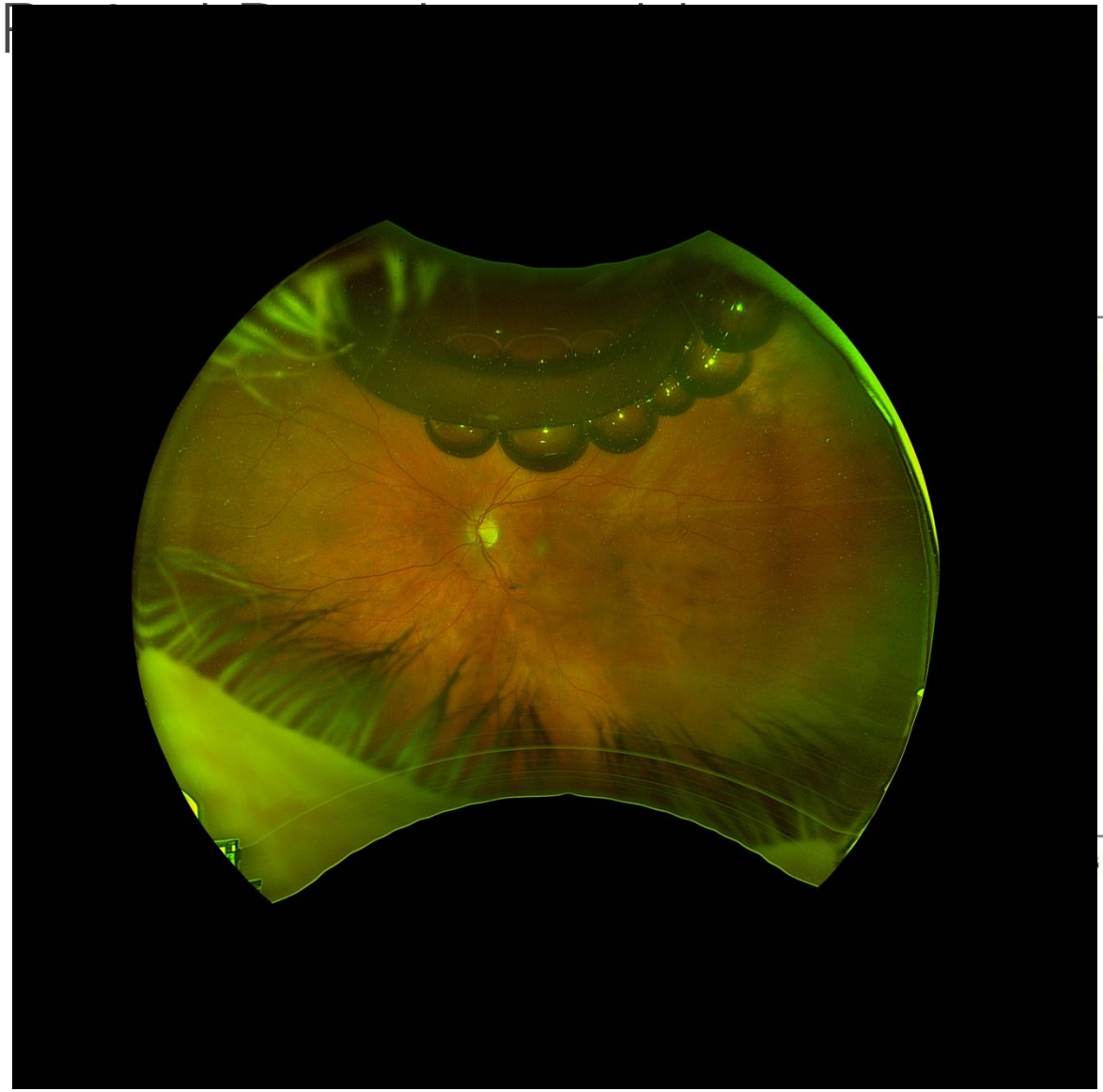
- Inject gas into the vitreous cavity (0.5cc SF6, 0.3cc C3F8)
- Bubble closes break, prevents additional SR fluid accumulation
- RPE pump resolves the RD
- Treat the break with retinopexy
  - Cryo the day of gas injection
  - Laser once the RD is resolved

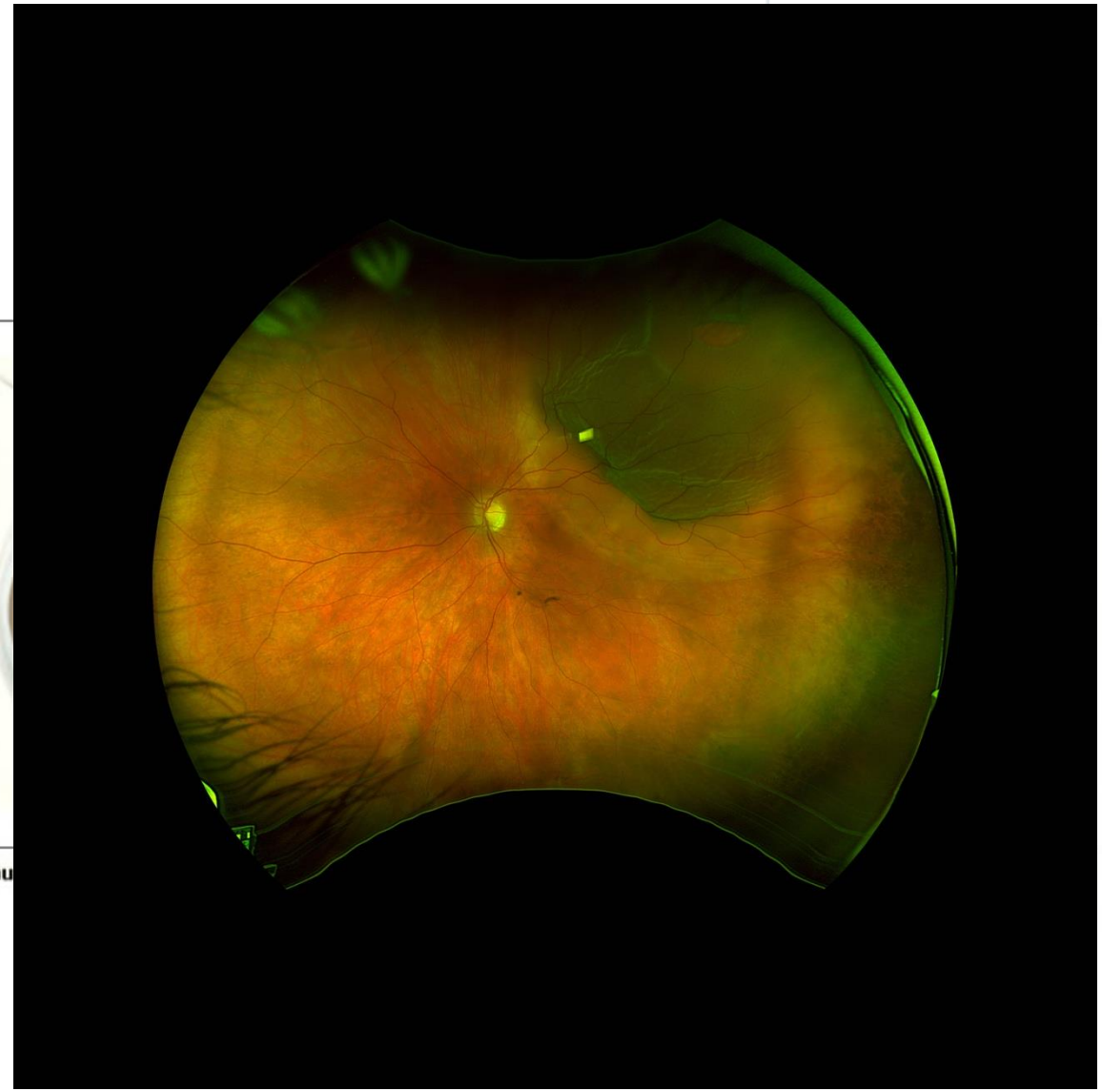


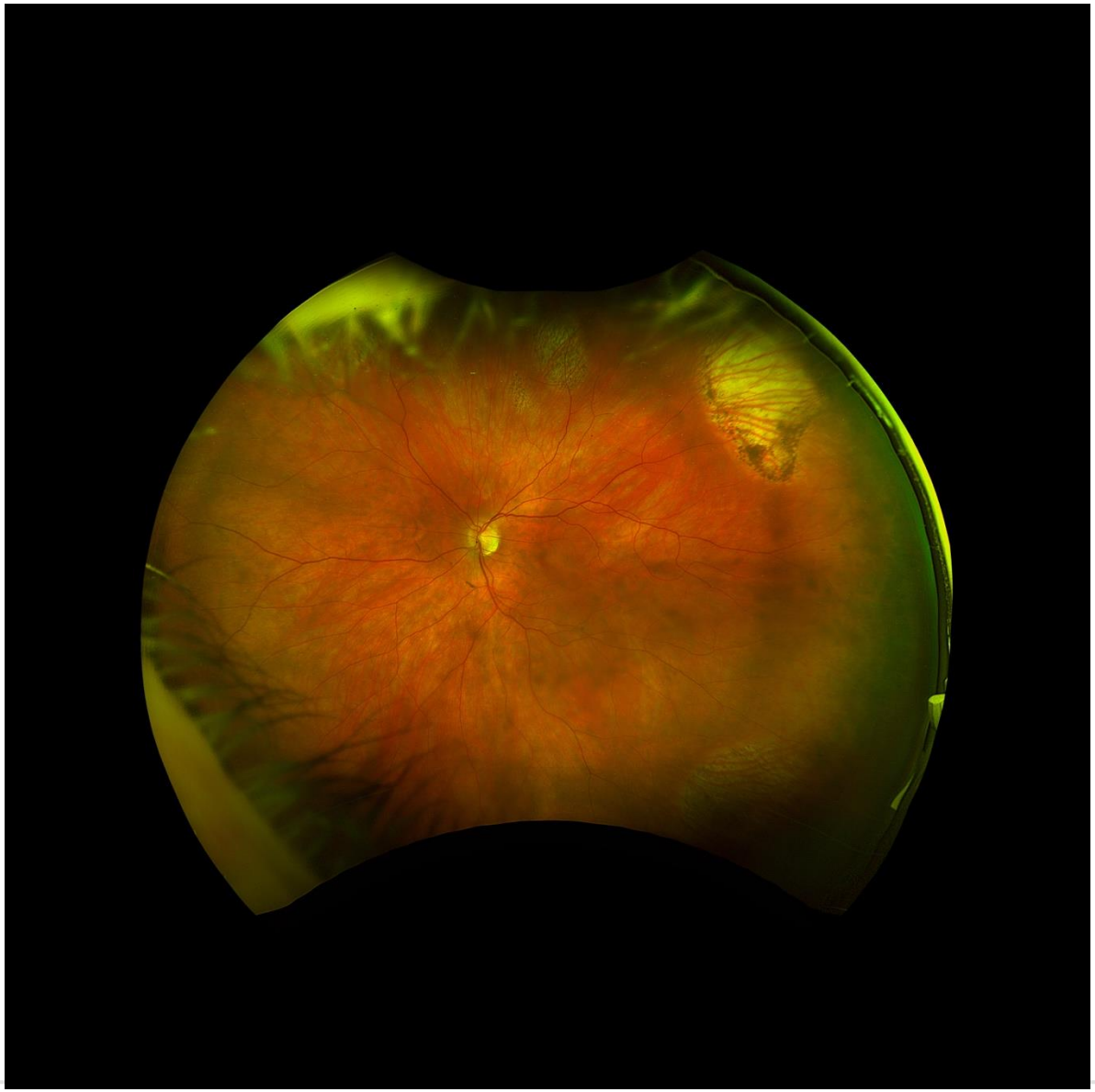
A gas bubble is injected into the vitreous.



With your head held steady in the right position, the gas bubble holds the retinal tear closed.







Retinal Detachment Management

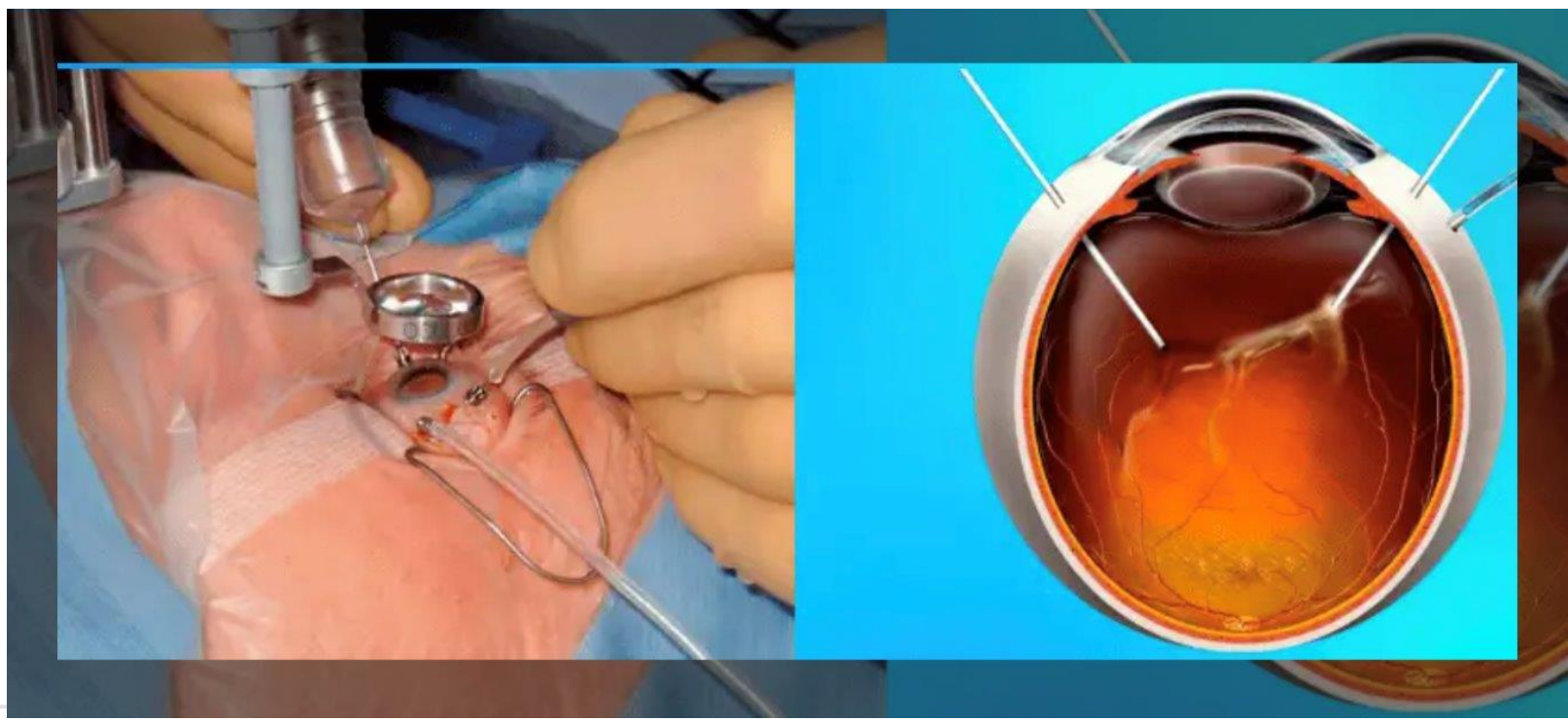
Pneumatic retinopexy

- Pros:
  - vs laser, fixes the RD
  - Avoids OR
  - Prompt same day treatment
  - Gas bubble never blocks the visual axis
- Cons
  - Altitude/positioning restrictions
  - New breaks
  - Subretinal gas (large breaks)
  - Only select cases
    - Single or grouped breaks above horizontal
  - PVR (cryo + gas = PVR)

Retinal detachment management

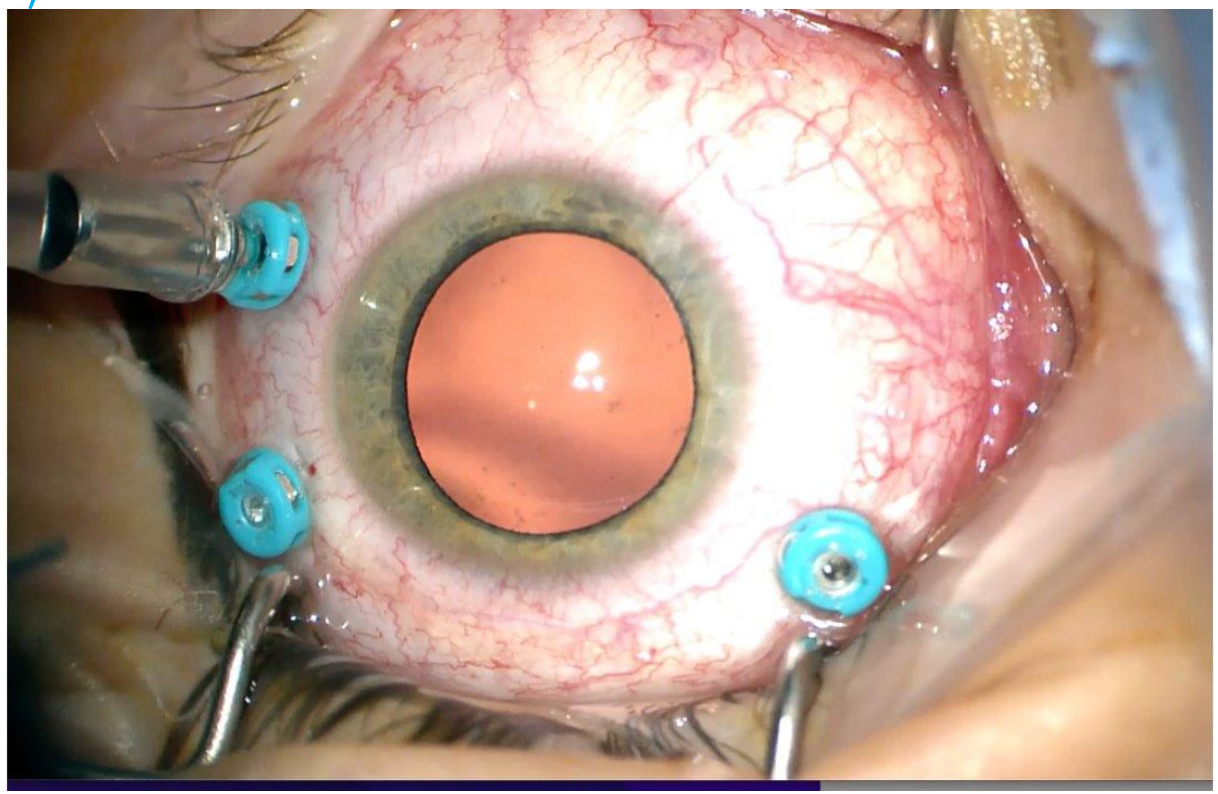
Primary vitrectomy (with endolaser and gas)

- Relieve vitreoretinal traction
- Drain subretinal fluid
  - Through break
  - Through retinotomy
- Laser break
- Gas tamponade
  - SF6 (~2 weeks)
  - C3F8 (~4-8 weeks)



Retinal detachment management

Primary vitrectomy (endolaser and gas)



- Pros:
  - Highest SSSR
  - Patient anesthetized
  - Quick and painless
- Cons:
  - Cataract acceleration
  - Altitude/positioning restrictions
  - OR availability->potential delay
    - Anesthesia/scrub tech/circulator/surgeon/insurance/NPO/driver
  - Loss of central vision until bubble <50%

Single Surgery Success Rate

- Laser demarcation: 80-97%
  - Highest success in asymptomatic RDs
  - Up to 40% failure in symptomatic RDs
- Pneumatic retinopexy: 70-81%
  - PIVOT trial: 81% SSSR, final success 99%
  - IRIS registry study: ~70% SSSR, final success >95%
  - When successful: Better Va/VRQL/less metamorphopsia vs PPV
  - Phakic, single superior break, no PVR = best odds of success
  - Pseudophakic, inferior breaks, PVR = worst odds of success
- Vitrectomy: 81-96%
  - PIVOT trial: 93% SSSR, final success 99%
  - Large retrospective studies: 81-96%
  - Risk of failure: increased # of breaks, extent of detachment, PVR, younger age

Back to our patient

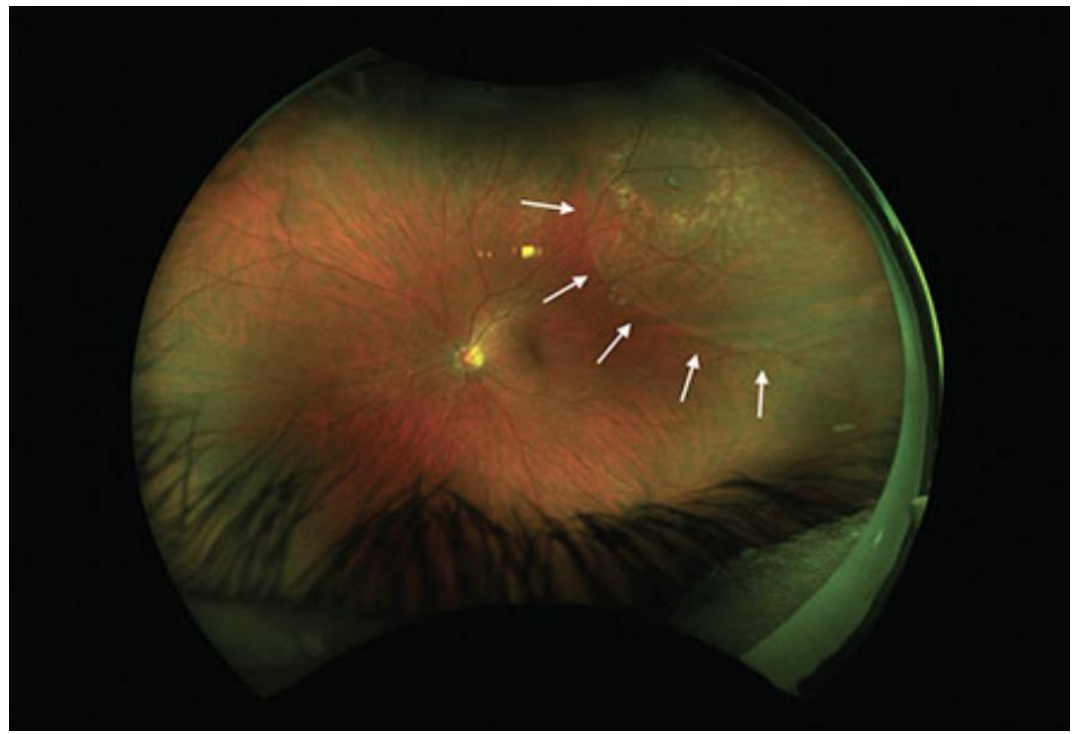
Friday 5pm

- Symptomatic F/F/shadow
- Phakic
- Acute PVD
- Single Superior break
- Mac on RD

Laser demarcation

Patient anticoagulated, want to avoid bad intraoperative hemorrhage

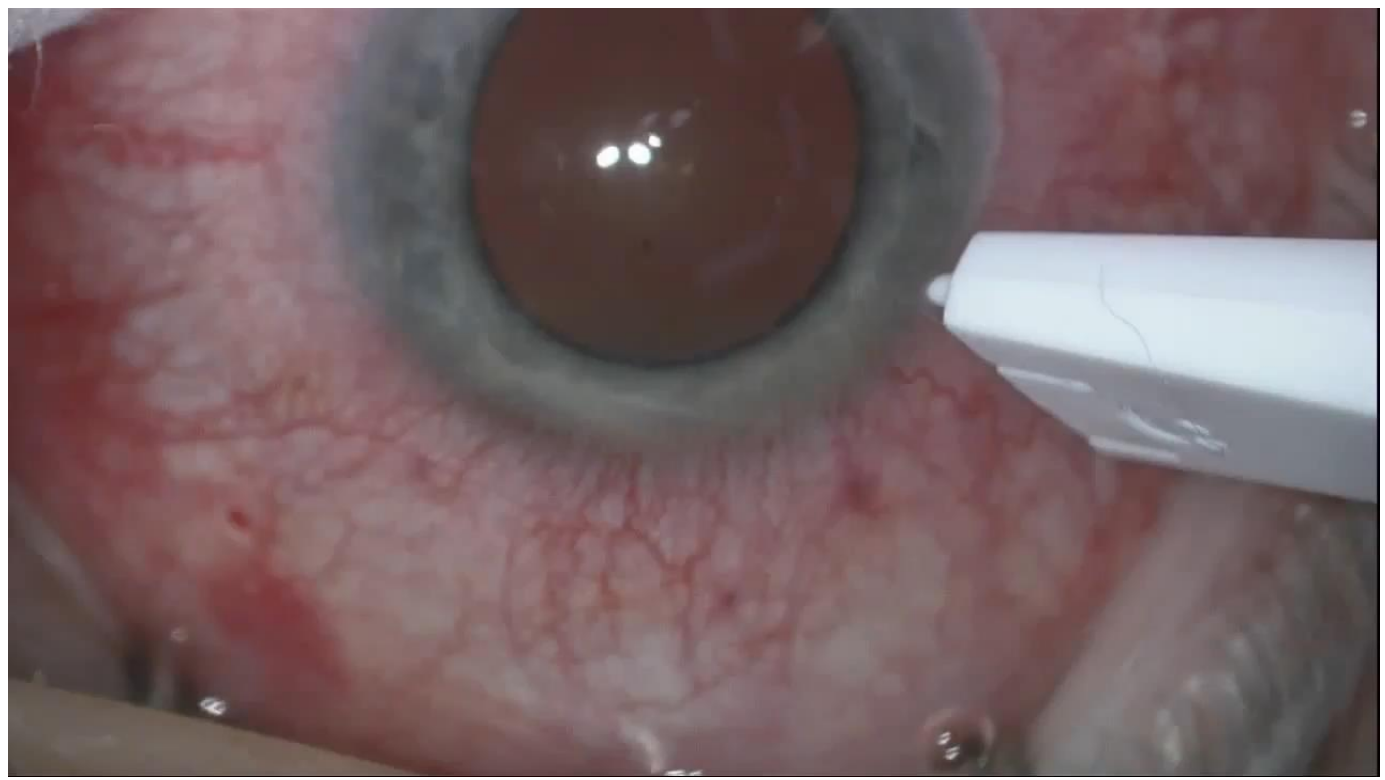
- Vasovagal response during procedure
  - Loss of consciousness, vomits
- POW1, fluid posterior to laser
  - High failure rate in symptomatic RDs
- Loss of faith, 2nd opinion
  - Delay in tx->macula off
- Never regains 20/20
- Complains to referring doc
- "OD's on Facebook" lights up excoriating you



Vitrectomy

You love to operate, PPV has highest SSSR, slam dunk, right?

- Delayed until Monday AM 2/2 anticoagulation
- Progress to macula off
- Otherwise uncomplicated PPV
- Va 20/30 after gas resolves
- Metamorphopsia and diplopia
- Claims you never discussed this
- One star review



Pneumatic Retinopexy

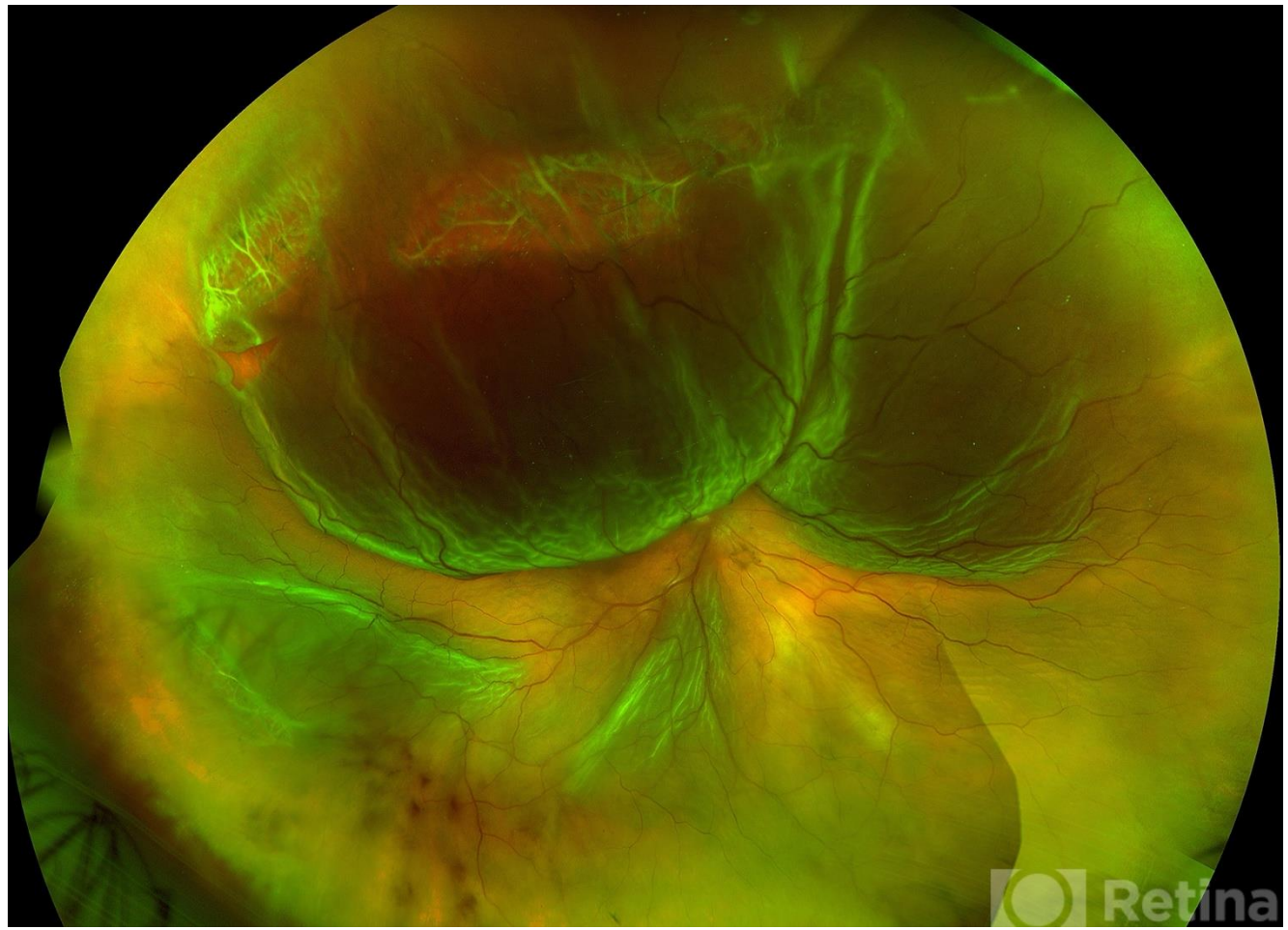
Phakic, single superior break

- You successfully perform PR
  - Cryo to the break
- POD#1: reattached, 25% gas
- POW#1: attached, 15% gas
- POW#2: attached, no gas
- No new breaks, no PVR
- Never loses central vision
- 5 star Google review
- You get tons of RD referrals…

Patient Returns five years later

Fellow eye: new flashes, floaters, shadow

- Pseudophakic
- Acute PVD
- Retinal detachment
- Multiple breaks
  - Above and below horizontal
- Patient wants “that bubble again” to avoid OR

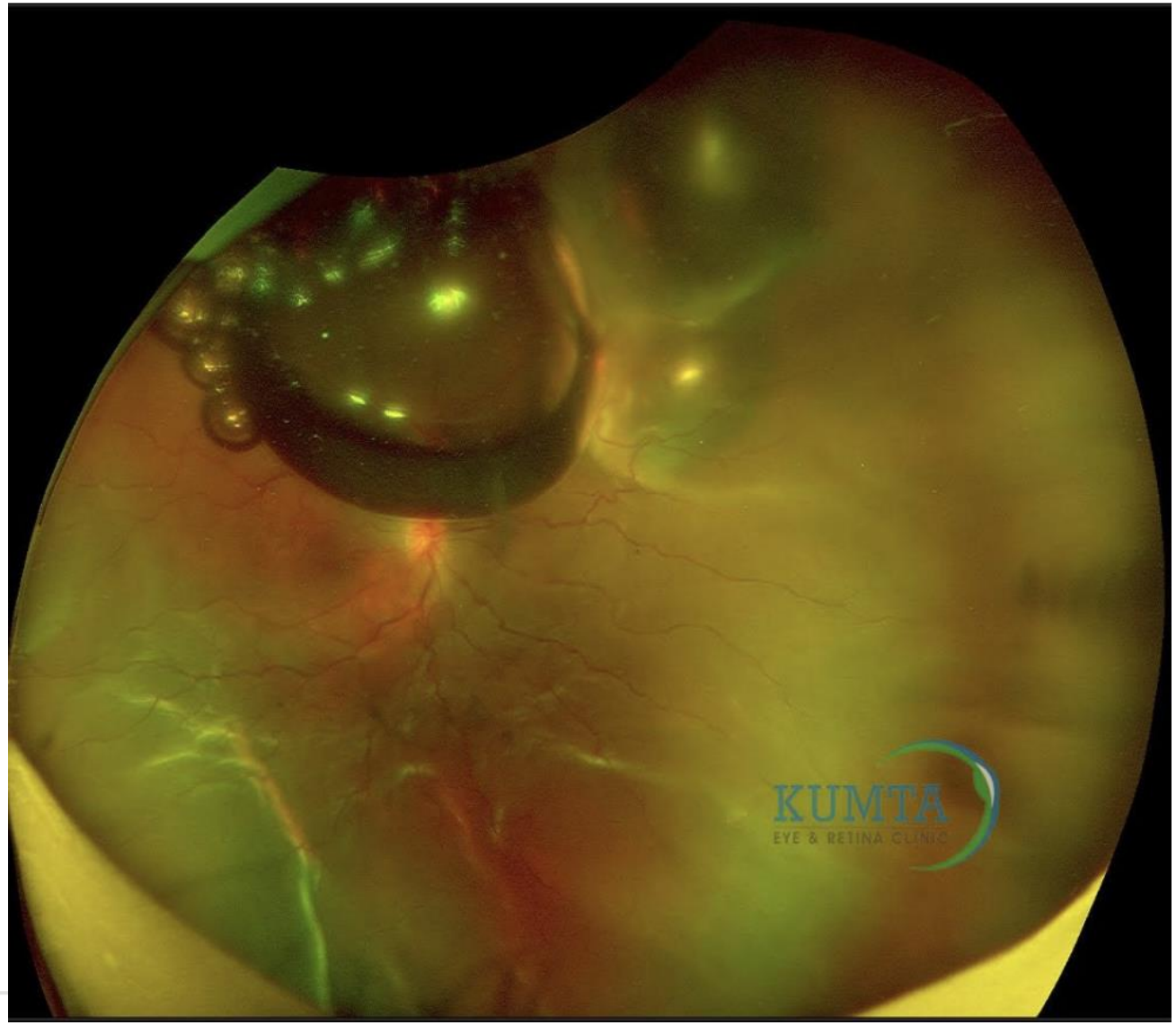


You Recommend Laser Demarcation

- Patient does not reattach
- Colleague sees patient next day
- You are put on probation by the practice
- Well. It's time to go back to the drawing board

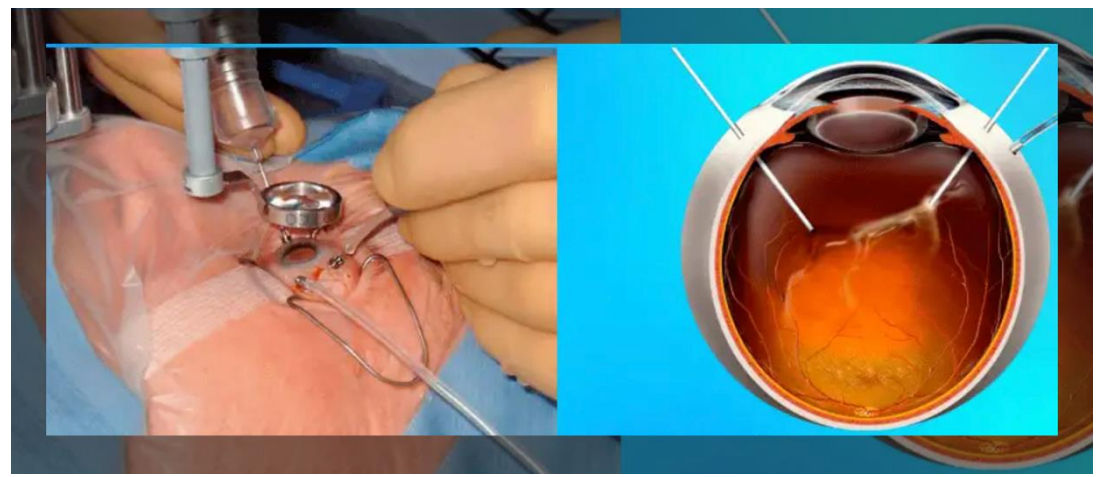
You Recommend Pneumatic Retinopexy

- Pseudophakic patient
- Breaks below the horizontal
- Both predict failure
- Post PR day 1->not reattaching
- Patient wants second opinion
- They won't touch it, back to you



You Recommend Vitrectomy/laser/gas

- pseudophakic w/ multiple breaks incl inferior, PPV highest SSSR
- Gas resolves in two weeks
- Patient regains good visual acuity
- You've now fixed both eyes
  - Patient hopes to never see you again
  - Waves goodbye with a smile



Two months later…
patient returns w/ new shadow

Proliferative vitreoretinopathy

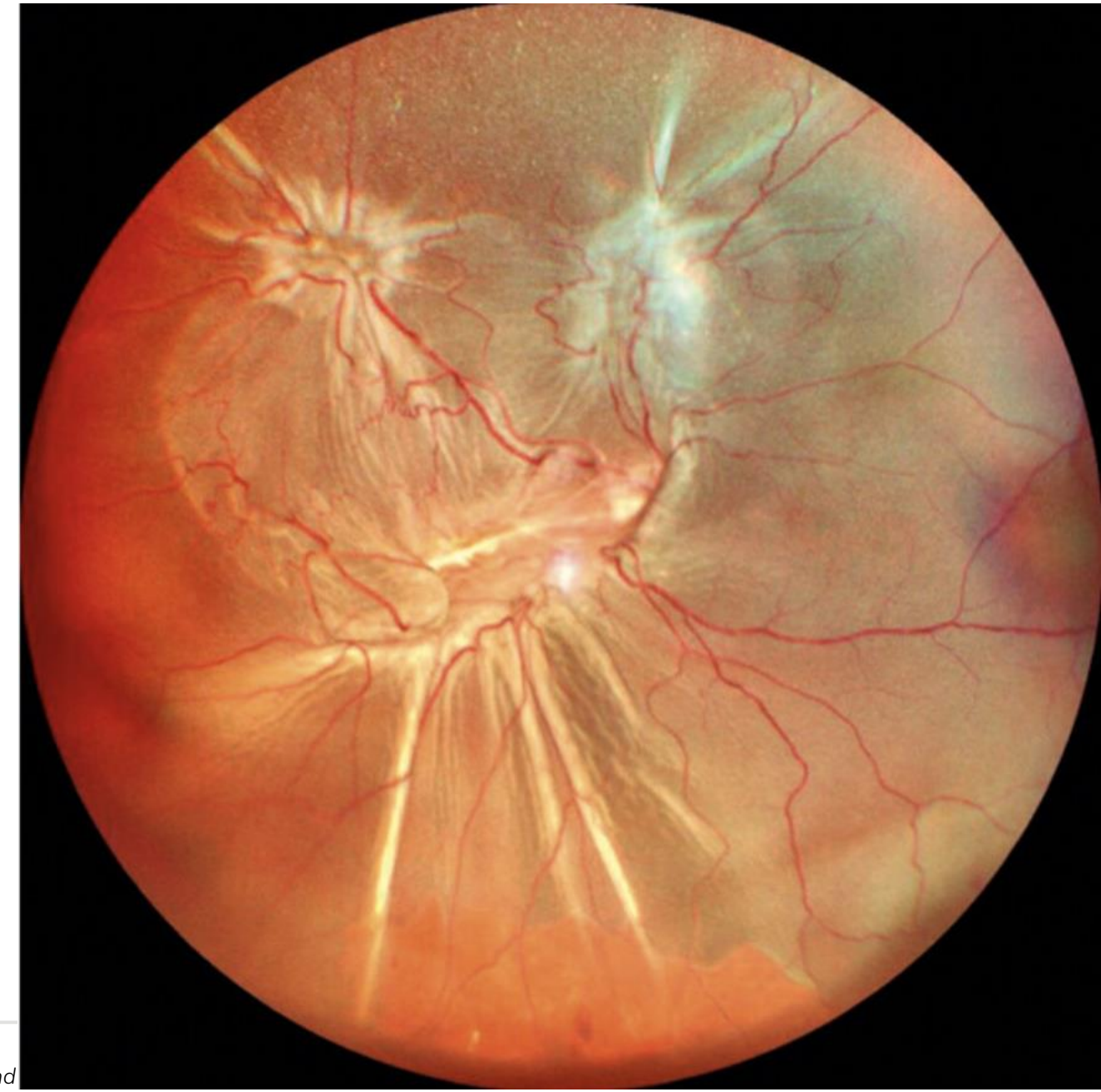
AKA the bane of VR surgeons' existence

- "PVR is an exaggerated wound healing response that occurs after retinal detachment, characterized by the formation of scar tissue membranes on and beneath the retina that contract and cause recurrent detachment".
- most common cause of surgical failure in RD repair, 5-10% of cases
- RPE/glial/inflammatory cells liberated into vitreous, transform into proliferataive fibroblast-like cells
- Lay down contractile membranes on/under/within the retina
- Cause recurrent *tractional* RD, folding/foreshortening of the retina

PVR

Risk factors

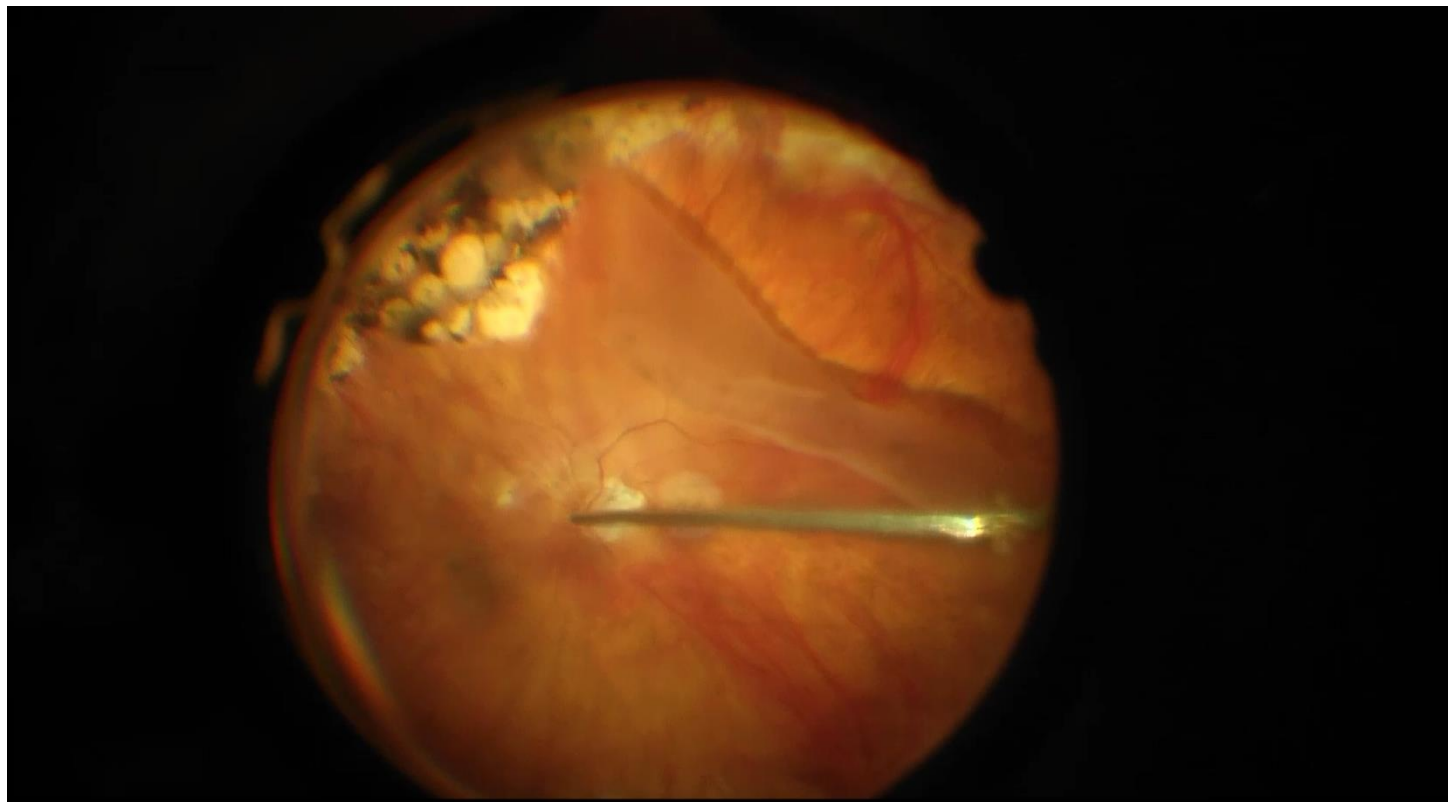
- Number/size of breaks
- Extent of detachment
- Chronicity pre-op
- Trauma
- Aphakia
- Vitreous hemorrhage
- Smoking
- Young age
- Y chromosome



PVR Management

Treatments: PPV/MP/EL/gas vs SO

- Relieve traction
  - Peel membranes
- Flatten retina (air/PFO)
- Drain subretinal fluid
- Assess foreshortening
- +/- retinectomy
  - Cut out foreshortened retina,
  - Allows for flattening
- +/- buckle
  - Counteract traction
- +/- MTX
  - antiproliferative



PVR risk recurrence

- Onc
  40%
- Visu
  recu
- Trau
  >inf
  >ad
  >inf
- Met

The GUARD trial is a Phase 3 clinical study evaluating the efficacy of intravitreal methotrexate (ADX-2191) in preventing proliferative vitreoretinopathy (PVR) after retinal detachment surgery.

Overview of the GUARD Trial

The GUARD trial is a multi-center, randomized, controlled, adaptive Phase 3 clinical trial designed to assess the safety and efficacy of repeated intravitreal injections of ADX-2191, a formulation of methotrexate, in patients undergoing surgery for recurrent retinal detachment due to PVR. The trial aims to determine whether this treatment can reduce the rates of redetachment and improve postoperative outcomes. ClinicalTrials.gov +1

Retinal detachment management

Summary- best use cases

- Laser: asymptomatic RDs
- Pneumatic: Phakic, 1 HST 10-2
  - VA and VRQL better than PPV
- PPV/laser gas: highest SSSR, especially pseudophakes.
- PVR: 5-10% of RDs. Risk factors
  - PPV/MP/long acting gas vs oil, adjunctive buckle/MTX?

References

1. Sabatino F, Banerjee P, K Muqit MM. Clinical Therapeutics for Proliferative Vitreoretinopathy in Retinal Detachment. *Surv Ophthal*. 2023.
2. Mudhar HS. A Brief Review of the Histopathology of Proliferative Vitreoretinopathy (PVR). *Eye*. 2020.
3. Wang WX, Xing M, Apte RS. Interventions for Proliferative Vitreoretinopathy. *JAMA Ophthalmology*. 2024.