Preoperative **Pn**eumatic **R**etinopexy as an Adjunct for Pars Plana Vitrectomy

PPnR Technique

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Summary

- This presentation reviews the use of preoperative pneumatic retinopexy (PPnR) as an adjunct to PPV for repair of RRD.
- The application of the PPnR technique was evaluated in a retrospective case series of RRDs with multiple large and/or inferior breaks.
- The findings suggest that PPnR may serve as a valuable two-stage surgical technique with high reattachment rate, enhanced ease of PPV, and good functional outcomes.

Introduction

Introduction

- Pars plana vitrectomy (PPV) is the most commonly performed procedure for primary rhegmatogenous retinal detachment (RRD) repair with a high retinal reattachment success rate.

- Nonetheless, suboptimal functional outcomes and metamorphopsia are the most common postoperative complications of RRD repair with PPV.[1]

- It has been suggested that variability in functional outcomes may be associated with the timing and ease of surgical repair.[2-4]

1. Okuda T, Higashide T, Sugiyama K. Metamorphopsia and Outer Retinal Morphologic Changes After Successful Vitrectomy Surgery for Macula-Off Rhegmatogenous Retinal. *Retina*. 2018; 38(1):148-154.
2. Greven MA, Leng T, Silva RA, et al. Reductions in final visual acuity occur even within the first 3 days after a macula-off retinal detachment. *Br J Ophthalmol*. 2019;103(10):1503-1506.
3. Kim JD, Pham HH, Lai MM, Josephson JW, Minarcik JR, Von Fricken M. Effect of symptom duration on outcomes following vitrectomy repair of primary macula-off retinal detachments. *Retina*. 2013;33(9):1931-1937.
4. Van Brussel EM, Valk Der Valk R, Bijlsma WR, La Heij EC. Impact of Duration of Macula-Off Retinal Detachment on Visual Outcome: A Systematic Review and Meta-analysis of Literature. *Retina*. 2013; 34(10):1917-25.

Rationale

A **two-stage** repair technique with preoperative pneumatic retinopexy (PPnR) may offer superior postoperative outcomes by providing a more gradual resorption of subretinal fluid (SRF) during pneumatic retinopexy compared to forced internal drainage during PPV.

Purpose

To discuss the role of PPnR as an adjunct to PPV for repair of RRD.

Methods

Study Design

- Retrospective consecutive case series, 2016-2019
- Single vitreoretinal surgeon's practice
- Toronto Western Hospital, University of Toronto, Canada

Inclusion Criteria

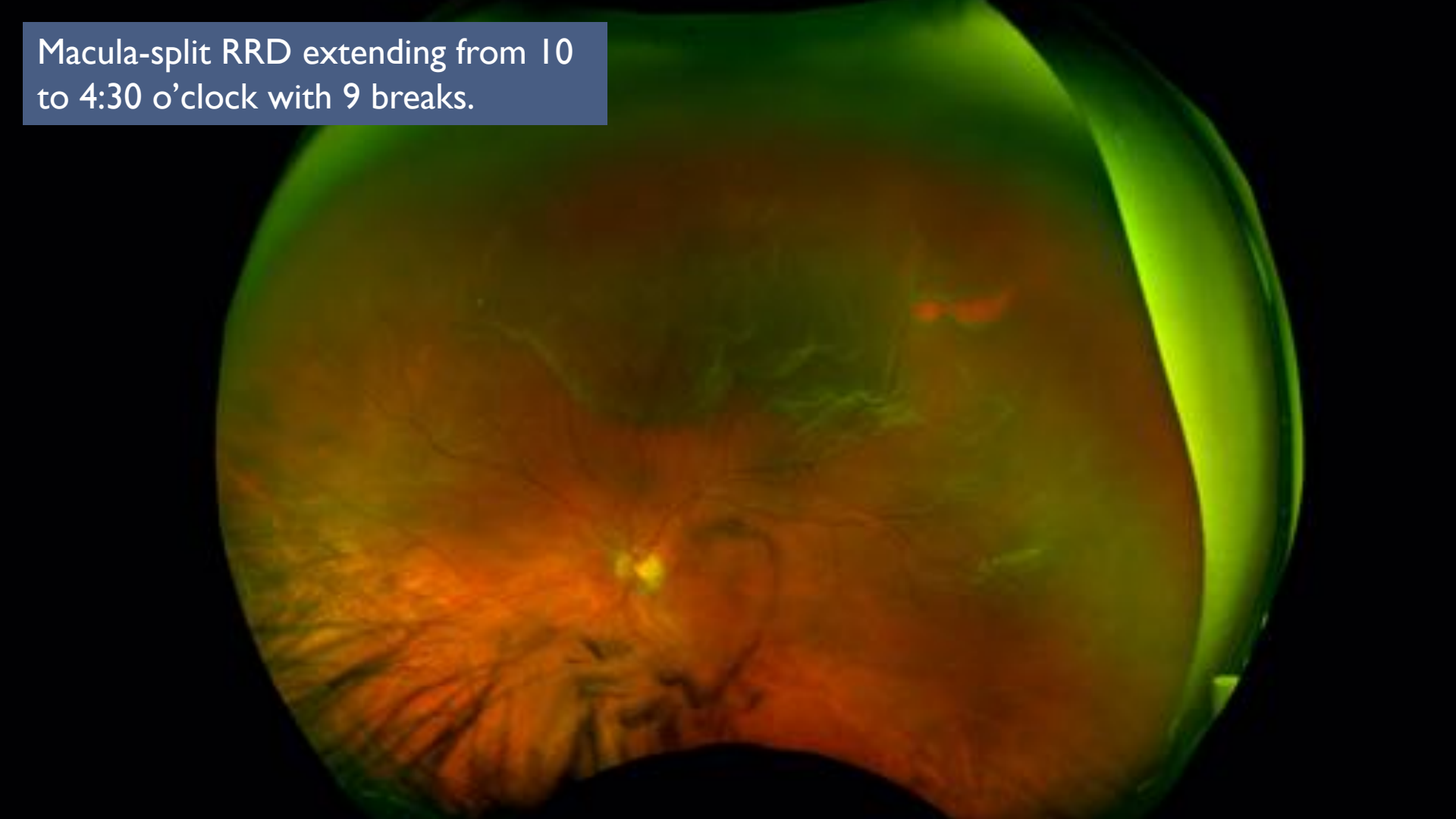
- RRDs with multiple large breaks in more than one quadrant, and/or inferior breaks requiring PPV

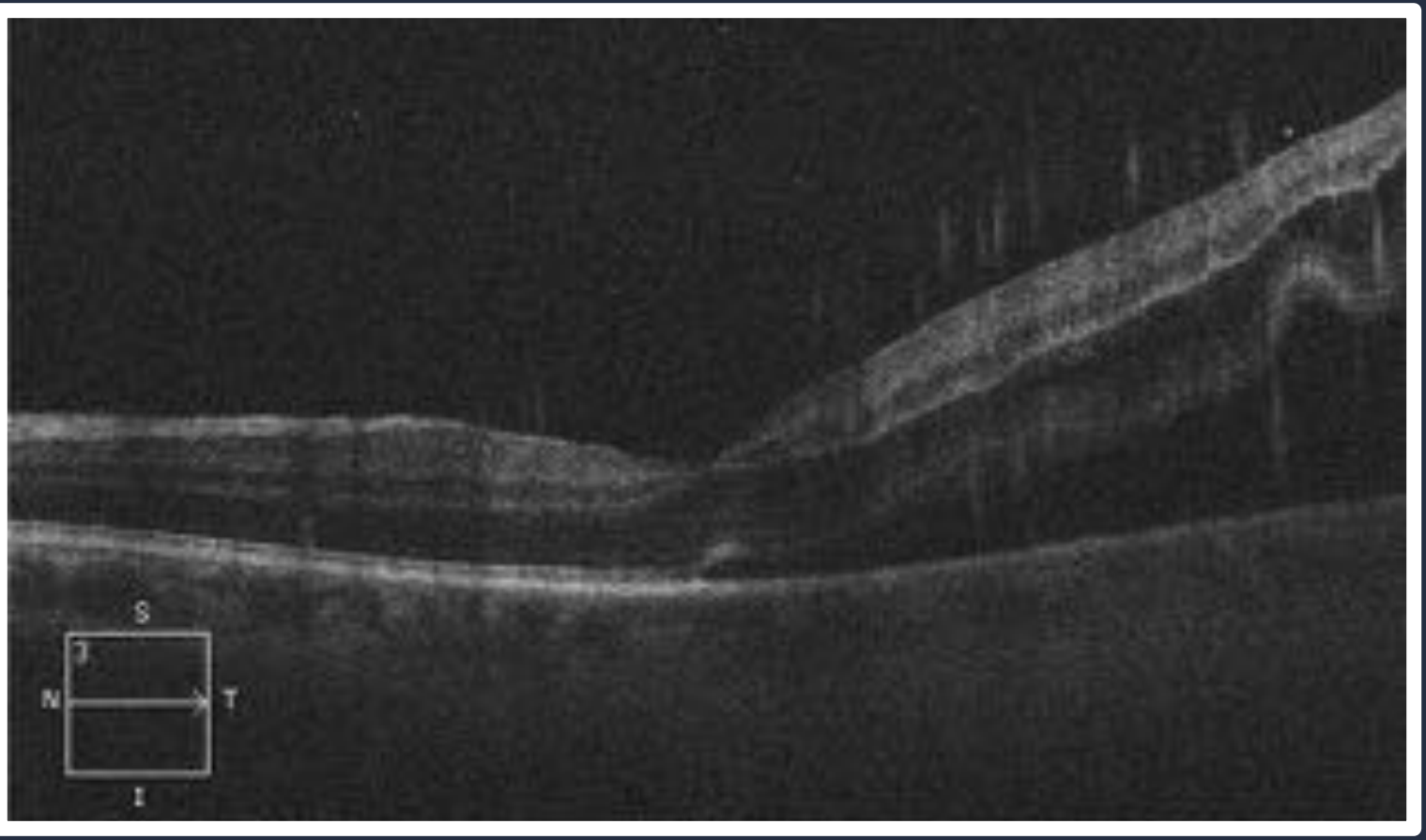
Exclusion Criteria

- PVR grade C or D
- Contraindications for intravitreal gas injection (air travel or living on high altitude)
- Inability to maintain head position post-operatively

Case

- 66-year-old ♂
- Macula-split RRD
- Vitreous hemorrhage


Macula-split RRD extending from 10 to 4:30 o'clock with 9 breaks.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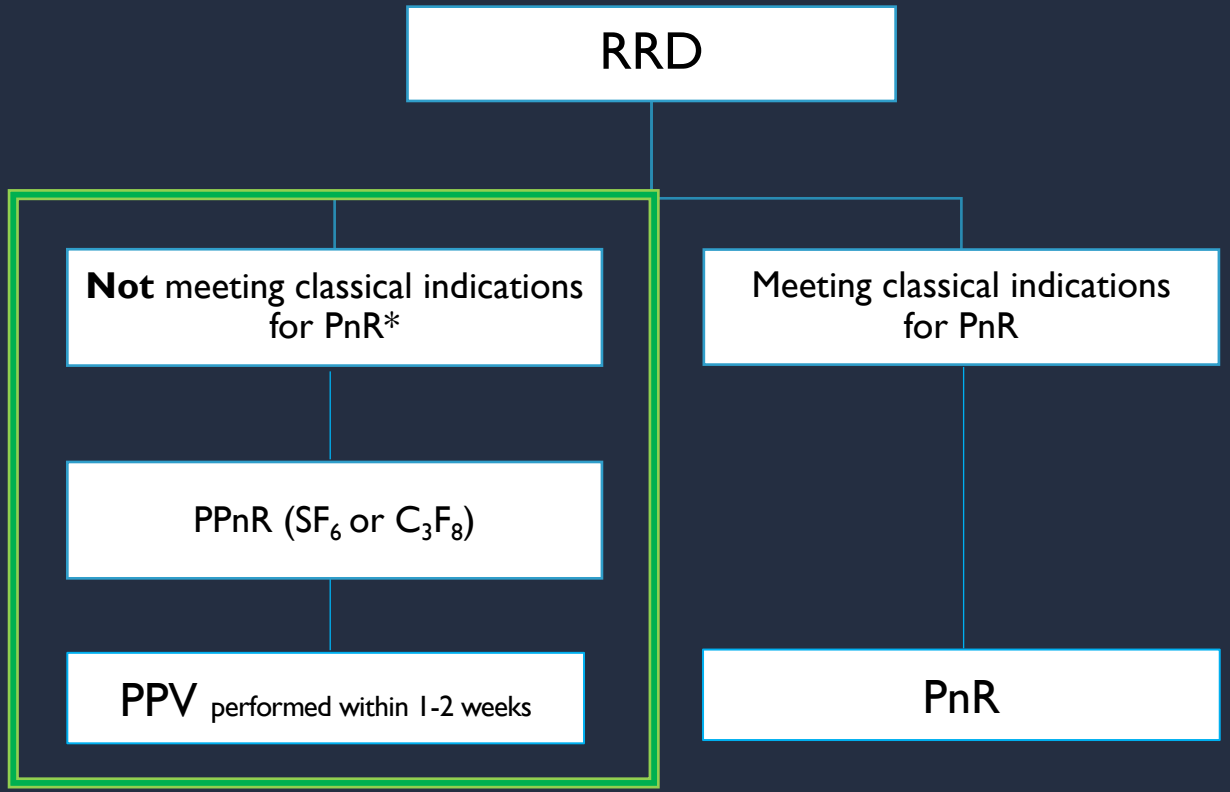
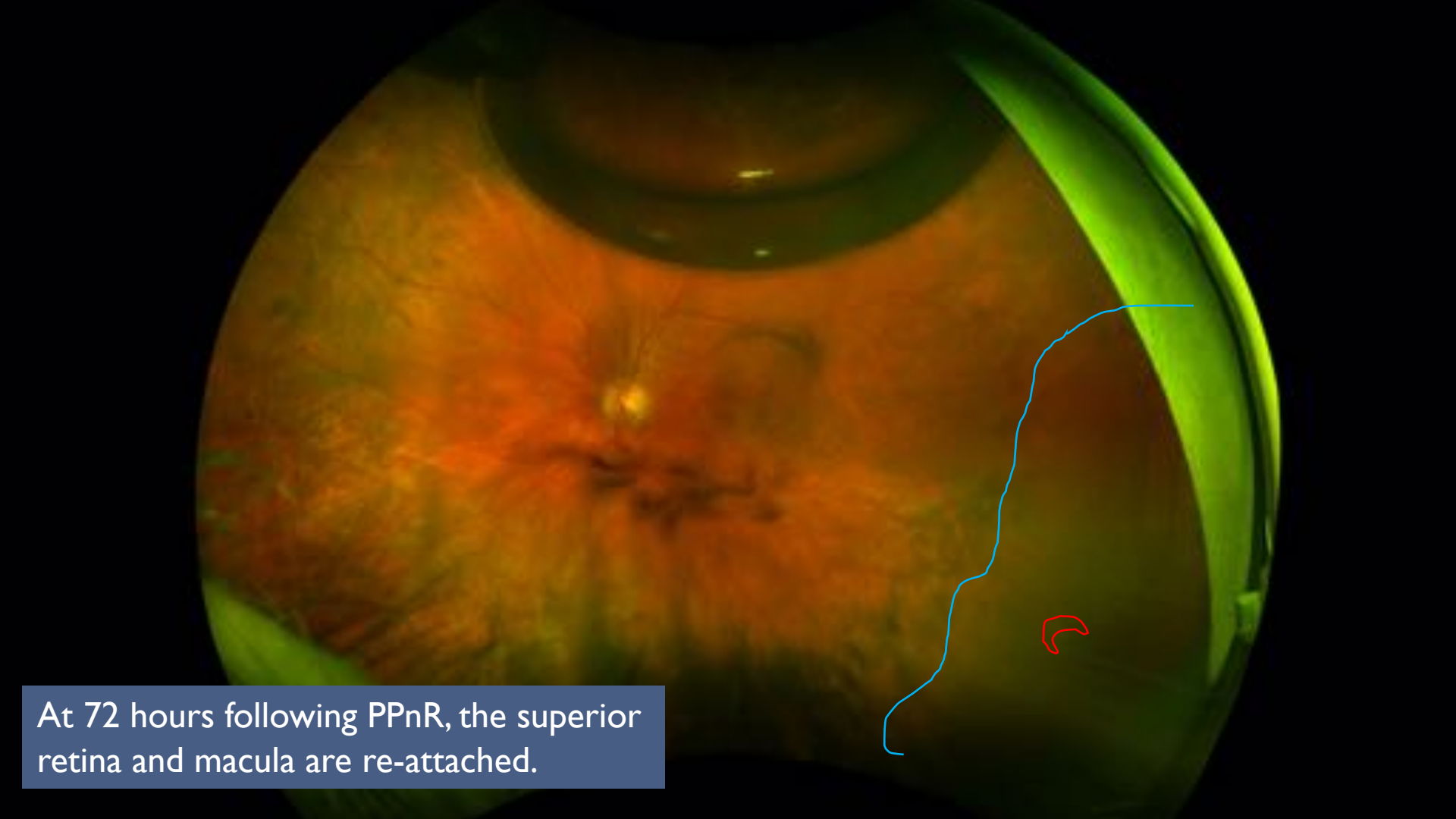
Procedure Sequence

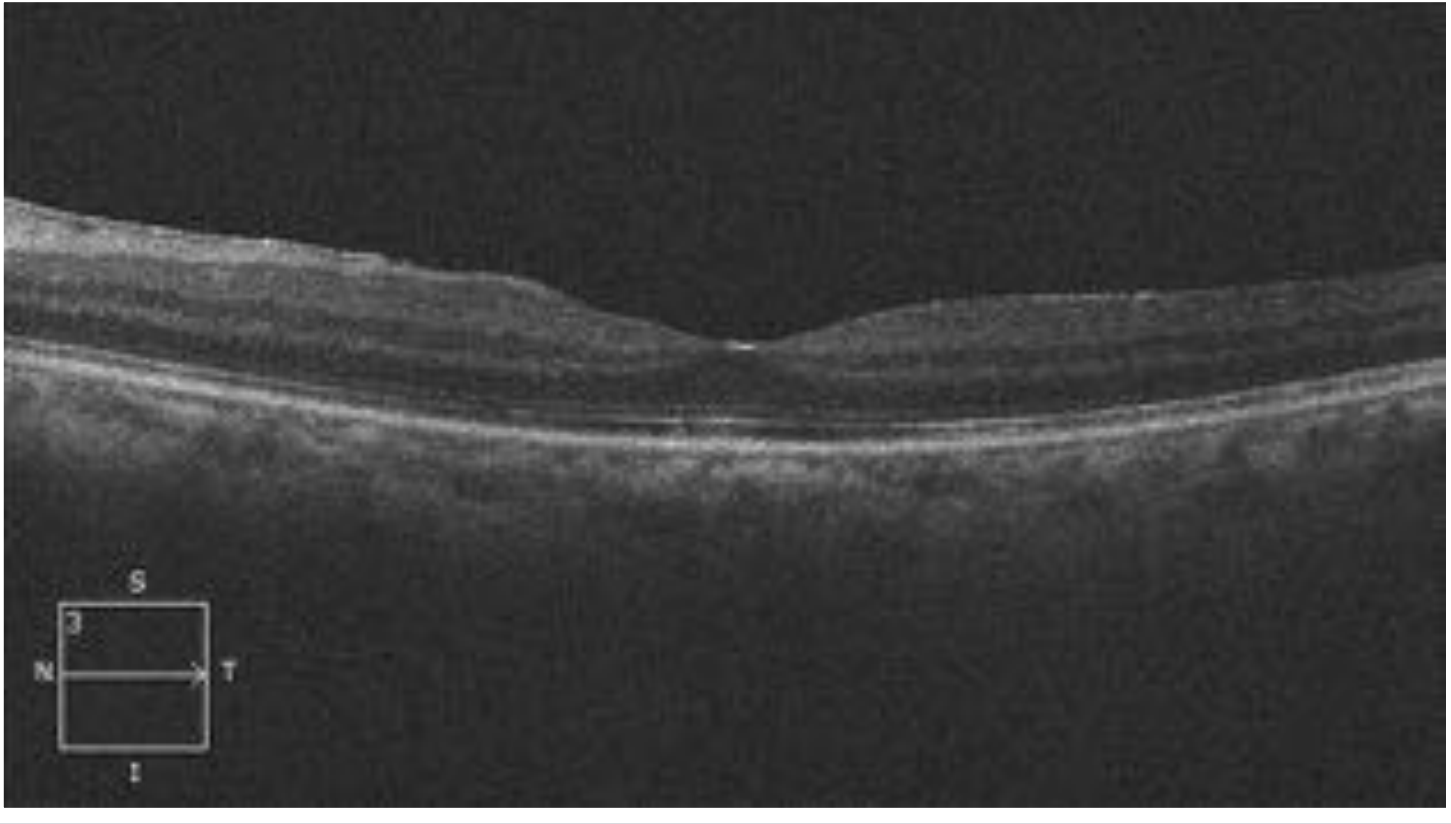


*multiple inferior breaks, cannot find a break, media opacity, patient uncooperative, etc.



At 72 hours following PPnR, the superior retina and macula are re-attached.

72 hours following PPnR



Blade removed from trocar slowly to percolate the gas through the open valve.

[Video]

Results

Overall Characteristics

106 eyes	
Age	62.5±11.4 years
Sex	21% females
Phakic	39%
Myope (>6D)	16%
RD History	11%
Lattice Degeneration	32%

Retinal Detachment Characteristics

- 69% macular involvement
- 5.3±2.2 clock hours of RD
- 35% inferior retinal breaks
- 2.8±1.9 breaks per eye
- 90% multiple retinal breaks in more than one clock hour

Procedure Characteristics

PPnR

19% SF_6 tamponade

PPV

4.5% Combined phaco-vitrectomy

21% SF_6 tamponade

Ease of Surgical Repair

4%	Perfluorocarbon heavy liquid
7%	Posterior drainage retinotomy
8%	Silicone oil tamponade

Anatomical and Functional Outcomes

91%	Primary anatomical success rate
20/40 (0.3±0.6 logMAR)	Best corrected visual acuity at last follow-up
348±329	Days of follow-up

Post-operative Complications

15%	ERM
10%	CME
10%	Residual SRF

Discussion

Proposed Benefits

Reduce

- The risk of macular involvement in macula-on RRDs
- The amount of macular SRF (more immediate macular reattachment)
- The amount of peripheral SRF (easier peripheral vitreous dissection)
- The likelihood of retinal folds postoperatively
- The need of a posterior drainage retinotomy
- The use of heavy PFO

Other Theoretical Benefits

Increase

- Likelihood of a more physiologic retinal reattachment, compared to manual drainage of SRF during PPV
- Accuracy of realignment of the photoreceptors to the RPE

Conclusions

A two-stage repair technique with PPnR may offer improved ease for PPV and superior postoperative outcomes by preoperative resorption of SRF.

THANK YOU

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