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# A Multicenter Study of Pneumatic Retinopexies Performed by Vitreoretinal Fellows

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- No financial disclosures.





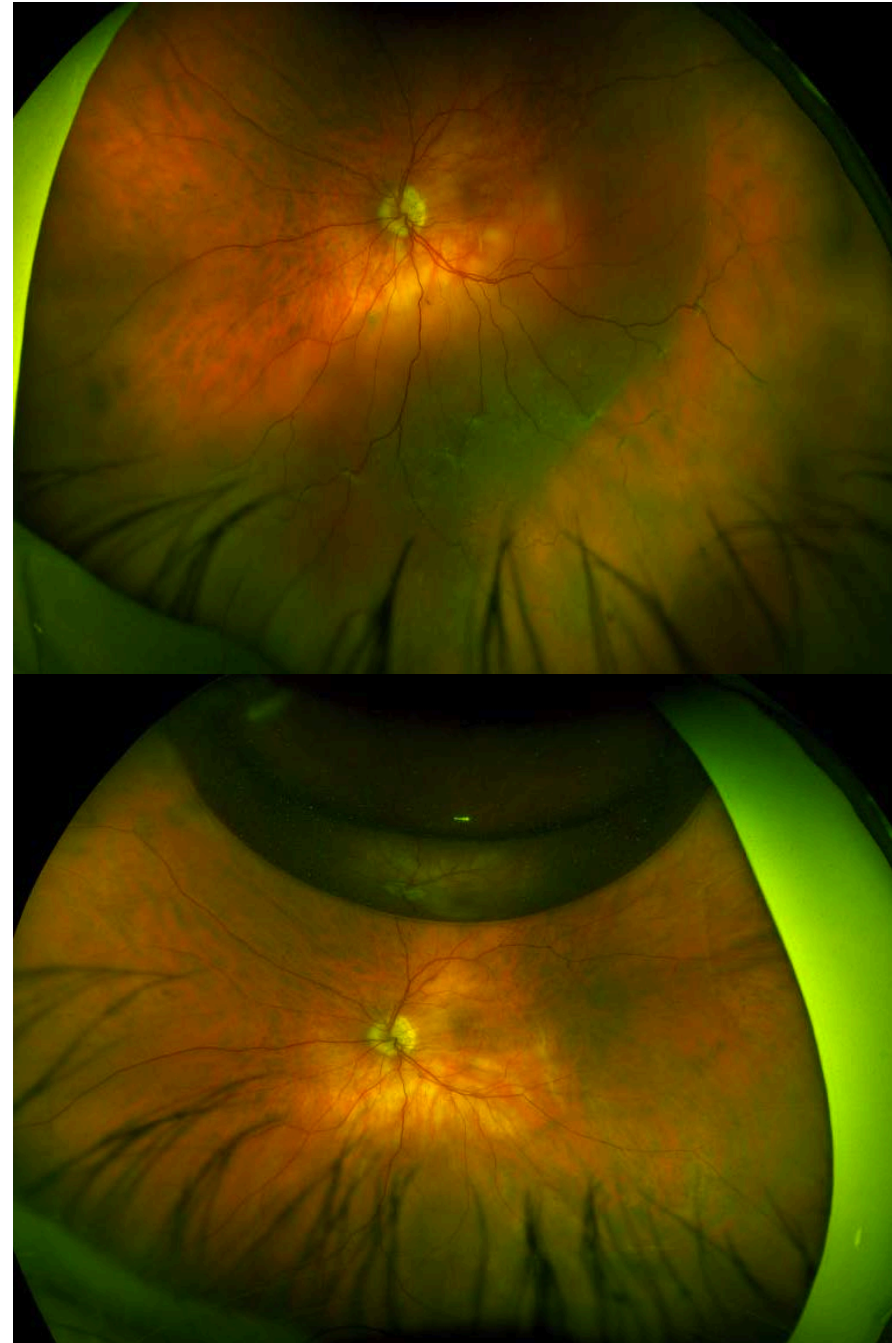
# MY ROLE IN THIS RESEARCH:

- ✓ Conception and design of the work/project
- ✓ Acquisition of data
- ✓ Analysis and interpretation of data
- ✓ Creation and/or critical review of the presentation



# BACKGROUND

- Pneumatic retinopexy (PR) is a minimally invasive, in-office procedure used for treatment of RD
- Use of PR varies among different retina specialists, clinical practices, and geographic regions.
- 2<sup>nd</sup> most common procedure for RD repair despite lower success rate (~43.7 -95.5%.)





- In fellowship, compared to other VR procedures, PR often involves less supervision.
- PR success depends highly on patient selection, examination skills, and manual dexterity which improves with practice.
- Although this procedure is tracked by the ASRS (Fellows' Activity Log), the experience and training of fellows varies widely



# OBJECTIVES

- To evaluate the experience of VR fellows performing PR and outcomes of patients who underwent PR by VR fellows at 6 academic centers in the United States.



# METHODS

- Multicenter, retrospective consecutive case series
- 6 sites; 2002-2016
- We excluded patients with
  - <3m follow-up
  - prior history of intraocular surgery except for uncomplicated cataract extraction

## Institutions Included in the Study

Associated Retinal Consultants

Duke University Eye Center

New York Eye & Ear Infirmary

University of California Davis

University of California San Diego

Wills Eye Hospital



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# RESULTS







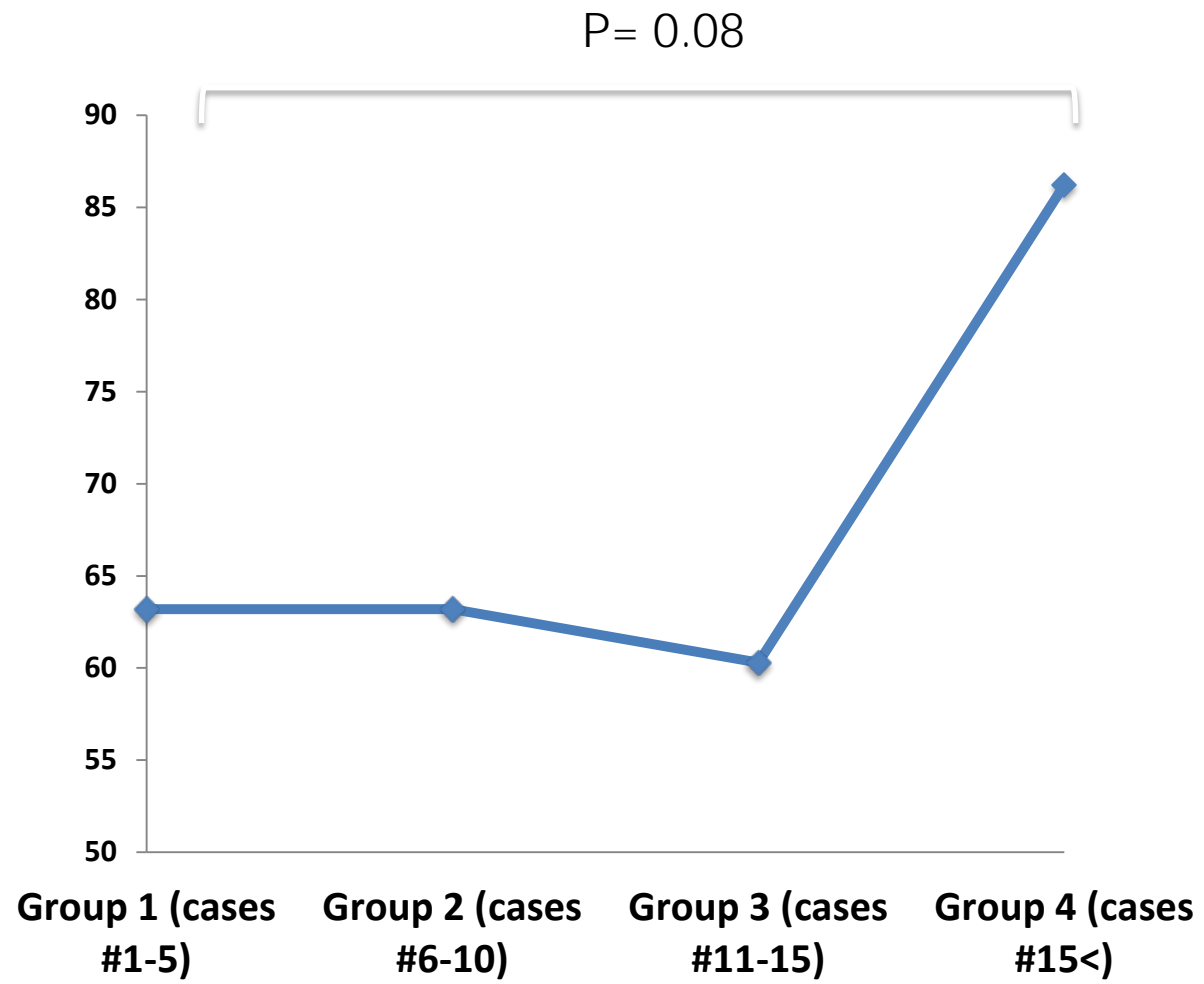
- 483 eyes of 483 pts
- 49 VR fellows;  
median:7 /fellow (range 1-24)
- Most of the procedures (270, 65.7%) done by 1<sup>st</sup> yrs
- Single-procedure success rate: 66.8%

| Baseline                          |               |
|-----------------------------------|---------------|
| Mean Age (SD)                     | 63.44 (10.97) |
| Sex                               |               |
| Female                            | 313 (65.1%)   |
| Male                              | 168 (34.9%)   |
| Mean logMAR BCVA (SD)             | 0.66 (0.72)   |
| Lens status                       |               |
| Phakic                            | 346 (71.8%)   |
| Pseudophakic                      | 136 (28.2%)   |
| Lattice degeneration (present)    | 91 (19.0%)    |
| Vitreous hemorrhage (present)     | 56 (11.6%)    |
| Location of break                 |               |
| Superior 8 clock hours            | 454 (98.9%)   |
| Inferior 4 clock hours            | 5 (1.1%)      |
| Macula status                     |               |
| Attached                          | 294 (61.1%)   |
| Detached                          | 187 (38.8%)   |
| Size of RD                        |               |
| <4 clock hours                    | 258 (54.4%)   |
| ≥4 clock hours                    | 216 (45.6%)   |
| 3-month Follow-up                 |               |
| Single-procedure success          | 322 (66.8%)   |
| Mean logMAR BCVA (SD)             | 0.43 (0.52)   |
| Mean number of re-operations (SD) | 1.19 (0.44)   |



# PR Experience

|  | <b>Group 1<br/>(1-5)<br/>(n=212)</b> | <b>Group 2<br/>(6-10)<br/>(n=106)</b> | <b>Group 3<br/>(11-15)<br/>(n=63)</b> | <b>Group 4<br/>(15+)<br/>(n=29)</b> | <b>P</b> |
|--|--------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------|----------|
| <b>BASELINE CHARACTERISTICS</b>          |                                      |                                       |                                       |                                     |          |
| <b>Mean Age (SD)</b>                     | 61.24 (11.91)                        | 65.03 (10.38)                         | 66.34 (8.49)                          | 65.68 (9.50)                        | 0.001*   |
| <b>Baseline logMAR<br/>BCVA (SD)</b>     | 0.70 (0.74)                          | 0.65 (0.71)                           | 0.53 (0.66)                           | 1.11 (0.90)                         | 0.007*   |
| <b>Lens status</b>                       |                                      |                                       |                                       |                                     | 0.01*    |
| <b>Phakic</b>                            | 166 (78.3%)                          | 71 (67.0%)                            | 42 (66.7%)                            | 16 (55.2%)                          |          |
| <b>Pseudophakic</b>                      | 46 (21.7%)                           | 35 (33.0%)                            | 21 (33.3%)                            | 13 (44.8%)                          |          |
| <b>Lattice degeneration</b>              | 44 (21.0%)                           | 20 (18.9%)                            | 14 (22.2%)                            | 6 (20.7%)                           | 0.95     |
| <b>Vitreous<br/>hemorrhage</b>           | 24 (11.3%)                           | 10 (9.4%)                             | 8 (12.7%)                             | 5 (17.2%)                           | 0.68     |
| <b>Macula status</b>                     |                                      |                                       |                                       |                                     | 0.26     |
| <b>Attached</b>                          | 116 (55.0%)                          | 66 (62.3%)                            | 41 (65.1%)                            | 20 (69.0%)                          |          |
| <b>Detached</b>                          | 95 (45.0%)                           | 40 (37.7%)                            | 22 (34.9%)                            | 9 (31.0%)                           |          |
| <b>Size of RD</b>                        |                                      |                                       |                                       |                                     | 0.86     |
| <b>&lt;4 clock<br/>hours</b>             | 103 (51.0%)                          | 48 (54.7%)                            | 32 (49.2%)                            | 16 (55.2%)                          |          |
| <b>≥4 clock<br/>hours</b>                | 103 (49.0%)                          | 48 (45.3%)                            | 32 (50.8%)                            | 13 (44.8%)                          |          |
| <b>3-MONTH FOLLOW-UP</b>                 |                                      |                                       |                                       |                                     |          |
| <b>logMAR BCVA at 3-<br/>mo (SD)</b>     | 0.45 (0.51)                          | 0.47 (0.56)                           | 0.45 (0.56)                           | 0.60 (0.71)                         | 0.57     |
| <b>Single-procedure<br/>reattachment</b> | 134 (63.2%)                          | 67 (63.2%)                            | 38 (60.3%)                            | 25 (86.2%)                          | 0.08     |



# Comparison of Sites



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|                           | Training Site 1<br>(n = 206) | Training Site 2<br>(n = 127) | Training Site 3<br>(n=71) | Training Site 4<br>(n=47) | Training Site 5<br>(n=18) | Training Site 6<br>(n=14) | Total<br>(n=483) | P-value |
|---------------------------|------------------------------|------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|------------------|---------|
| Baseline                  |                              |                              |                           |                           |                           |                           |                  |         |
| Mean Age (SD)             | 66.22<br>(10.26)             | 62.32<br>(9.78)              | 64.15<br>(10.48)          | 55.54<br>(12.66)          | 60.55<br>(13.62)          | 57.07<br>(9.60)           | 63.44<br>(10.97) | <0.001* |
| Mean logMAR BCVA (SD)     | 0.71<br>(0.77)               | 0.76<br>(0.75)               | 0.47<br>(0.54)            | 0.52<br>(0.62)            | 0.52<br>(0.69)            | 0.67<br>(0.65)            | 0.66<br>(0.72)   | 0.06    |
| Lens status               |                              |                              |                           |                           |                           |                           |                  | 0.07    |
| Phakic                    | 134<br>(65.0%)               | 99<br>(78.0%)                | 50<br>(70.4%)             | 38<br>(80.9%)             | 14<br>(77.8%)             | 11<br>(78.6%)             | 346<br>(71.8%)   |         |
| Pseudophakic              | 72<br>(35.0%)                | 27<br>(21.3%)                | 21<br>(29.6%)             | 9<br>(19.1%)              | 4<br>(22.2%)              | 3<br>(21.4%)              | 136<br>(28.2%)   |         |
| Lattice degeneration      | 43<br>(20.9%)                | 26<br>(20.5%)                | 7<br>(9.9%)               | 12<br>(26.1%)             | 1<br>(5.9%)               | 2 (14.3%)                 | 91<br>(19.0%)    | 0.14    |
| Vitreous hemorrhage       | 26<br>(12.6%)                | 9<br>(7.1%)                  | 8<br>(11.3%)              | 8<br>(17.0%)              | 3<br>(16.7%)              | 2 (14.3%)                 | 56<br>(11.6%)    | 0.47    |
| Macula status             |                              |                              |                           |                           |                           |                           |                  | 0.002*  |
| Attached                  | 134<br>(65.4%)               | 58<br>(45.7%)                | 50<br>(70.4%)             | 31<br>(66.0%)             | 14<br>(77.8%)             | 7<br>(50%)                | 294<br>(61.1%)   |         |
| Detached                  | 71<br>(34.6%)                | 69<br>(54.3%)                | 21<br>(29.6%)             | 16<br>(34.0%)             | 4<br>(22.2%)              | 7<br>(50%)                | 187<br>(38.8%)   |         |
| Size of RD                |                              |                              |                           |                           |                           |                           |                  | 0.17    |
| <4 clock hours            | 111<br>(54.1%)               | 64<br>(50.8%)                | 45<br>(69.2%)             | 23<br>(48.9%)             | 8<br>(44.4%)              | 7<br>(50%)                | 258<br>(54.4%)   |         |
| ≥4 clock hours            | 94<br>(45.6%)                | 62<br>(49.2%)                | 20<br>(30.8%)             | 24<br>(51.1%)             | 10<br>(55.6%)             | 7<br>(50%)                | 216<br>(45.6%)   |         |
| 3-Month Follow-Up         |                              |                              |                           |                           |                           |                           |                  |         |
| Single-procedure success  | 62.6%                        | 68.5%                        | 81.7%                     | 48.9%                     | 77.8%                     | 78.6%                     | 66.8%            | 0.003*  |
| Mean logMAR BCVA (SD)     | 0.52<br>(0.62)               | 0.46<br>(0.50)               | 0.21<br>(0.26)            | 0.40<br>(0.45)            | 0.26<br>(0.35)            | 0.27<br>(0.36)            | 0.43<br>(0.52)   | <0.001* |
| Mean # re-operations (SD) | 1.14<br>(0.38)               | 1.26<br>(0.44)               | 1.07<br>(0.27)            | 1.34<br>(0.64)            | 1                         | 1                         | 1.19<br>(0.44)   | 0.23    |





# Outcomes

| <b>Anatomic Success</b>                                     |                 |           |                |
|---|-----------------|-----------|----------------|
|   | <b>Estimate</b> | <b>SE</b> | <b>P-Value</b> |
| <b>Lens status (Pseudophakia)</b>                           | -0.13           | 0.05      | 0.01*          |
| <b>Size of detachment (<math>\geq 4</math> clock hours)</b> | -0.12           | 0.05      | 0.02*          |
| <b>Macula status</b>  | 0.06            | 0.05      | 0.23           |
| <b>Procedure experience (<math>\geq 15</math> cases)</b>    | 0.06            | 0.03      | 0.06#          |
| <b>Training site</b>  | 0.003           | 0.02      | 0.89           |

| <b>Visual Outcome</b>           |                 |           |                |
|---------------------------------|-----------------|-----------|----------------|
|                                 | <b>Estimate</b> | <b>SE</b> | <b>P-Value</b> |
| <b>LogMAR BCVA</b>              | 0.23            | 0.03      | $<0.001^*$     |
| <b>Sex (Male)</b>               | -0.75           | 0.04      | 0.11           |
| <b>Macula status (Attached)</b> | -0.04           | 0.05      | 0.37           |
| <b>Training site</b>            | -0.49           | 0.01      | 0.001*         |



# CONCLUSION

- Anatomic success of PR in hands of fellows is comparable to rates reported from experienced specialists.
- Procedure experience (and not overall experience in fellowship) plays a significant role.
- These data can be used to design a more uniform curriculum and creation of educational milestones in fellowship training.



# ACKNOWLEDGMENTS

- Glenn Yiu, MD, PhD (University of California, Davis Eye Center)
- Wills Eye Hospital
  - Jordan Deanor, MD
  - Ferhina Ali, MD, MPH
  - Michael Klufas, MD
- Associated Retinal Consultants, Royal Oaks, MI:
  - Priyanka Chopra, MD
  - Jeremy Wolfe, MD
- New York Eye and Ear Infirmary
  - Richard Kaplan, MD
  - Meenakashi Gupta, MD
- Duke University Eye Center
  - Dilraj Grewal, MD
- University of California, San Diego, Shiley Eye Center
  - Kevin Chen, MD
  - Eric Nudelman, MD, PhD



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