Title
Pneumatic Retinopexy Experience and Outcomes of Vitreoretinal Fellows in the United States A Multicenter Study

Journal
Ophthalmology Retina, 3(2)

ISSN
2468-7219

Authors
Emami-Naeini, Parisa
Deaner, Jordan
Ali, Ferhina S
et al.

Publication Date
2019-02-01

DOI
10.1016/j.oret.2018.09.010

Peer reviewed

HHS Public Access

Author manuscript

Ophthalmol Retina. Author manuscript; available in PMC 2020 February 01.

Published in final edited form as:

Ophthalmol Retina. 2019 February ; 3(2): 140–145. doi:10.1016/j.oret.2018.09.010.

Pneumatic Retinopexy Experience and Outcomes of Vitreoretinal Fellows in the United States: A Multicenter Study

Parisa Emami-Naeini, MD, MPH[1], **Jordan Deaner, MD**[2], **Ferhina Ali, MD, MPH**[2], **Priyanka Gogte, MD**[3], **Richard Kaplan, MD**[5], **Kevin C. Chen, MD**[6], **Eric Nudleman, MD, PhD**[6], **Dilraj S. Grewal, MD**[4], **Meenakashi Gupta, MD**[5], **Jeremy D. Wolfe, MD, MS**[3], **Michael Klufas, MD**[2], **Glenn Yiu, MD, PhD**[1], and **for the Academic Vitreoretinal Training Centers Study Group**

[1]Department of Ophthalmology & Vision Science, University of California, Davis, Sacramento, CA

[2]Wills Eye Hospital, Philadelphia, PA

[3]Associated Retinal Consultants, Royal Oak, MI

[4]Duke University Eye Center, Durham, NC

[5]New York Eye and Ear Infirmary of Mount Sinai, New York, NY

[6]University of California, San Diego, Shiley Eye Center, San Diego, CA

Abstract

Objective: To evaluate the outcomes of patients undergoing pneumatic retinopexy (PR) performed by vitreoretinal fellows at 6 academic centers in the United States

Design: Retrospective, multicenter, consecutive case series.

Participants: 483 patients with primary retinal detachments who underwent PR by 49 vitreoretinal fellows from 6 U.S. training sites between 2002 and 2016.

Methods: We reviewed medical records of patients and recorded baseline clinical characteristics (age, sex, baseline visual acuity, lens status, presence of lattice degeneration, presence of vitreous hemorrhage, location of retinal breaks, macular status, and size of detachment), visual and anatomic outcomes at 3-months after PR, as well as training level and PR experience of the fellow at the time of the procedure.

Main Outcome Measures: Single-procedure anatomic success and visual acuity at 3-months follow-up, and association with clinical and training-related factors.

Results: Vitreoretinal fellows performed a variable number of PR, with a median of 7 cases per fellow (range 1–24). Single-procedure anatomic success was 66.8%, and mean LogMAR visual

Address for reprints: Glenn Yiu, MD, PhD, UC Davis Eye Center, 4860 Y Street, Suite 2400, Sacramento, CA 95817.

Meeting Presentation: presented at the American Academy of Ophthalmology Annual Meeting, 2017 and Association for Research in Vision & Ophthalmology Meeting 2018

Disclosure: No conflicting relationship exists for any author

outcome was 0.43 (Snellen equivalent 20/54) at 3 months. Factors that were independently associated with single-procedure success include phakic lens status (P = 0.01), smaller size of retinal detachment (P = 0.02), and the fellow's procedure experience (P = 0.01). The only factor associated with worse visual outcome was baseline visual acuity (P < 0.001)

Conclusion: Vitreoretinal fellows perform variably few pneumatic retinopexies but have outcomes comparable to reported rates by experienced specialists. Procedure experience of individual fellows may impact anatomic outcomes.

INTRODUCTION:

The use of pneumatic retinopexy (PR) as the primary procedure for retinal detachment (RD) repair varies widely among retina specialists, clinical practices, and geographic regions in the United States. Historically, clinicians on the west coast of the United States (US) reported the highest rate of PR use. This trend, however, shifted in recent years with the northeast US demonstrating a preference for PR compared to the rest of the country. Despite a recent overall decline in the use of PR, national data show that PR remains the second most common procedure for RD repair among US Medicare beneficiaries, after pars plana vitrectomy (PPV) with or without scleral buckle (SB), but more common than SB procedures alone.,

One explanation for the evolving utilization of PR is the disparity in the exposure of retina specialists to this procedure during fellowship training across different programs. Although PR is one of the procedures tracked by the American Society of Retina Specialists (ASRS) Fellows' Activity Log, the experience and training of vitreoretinal fellows performing PR varies widely between different fellowship programs. Yet, compared to RD repair with PPV, where rates of anatomic success are high, single-procedure success after PR are lower even in the hands of experienced retinal specialists, and outcomes depend heavily upon careful patient selection, clinical examination skills, and postoperative monitoring. Also, because PR is performed in the outpatient setting, the amount of supervision by attending physicians over vitreoretinal fellows may vary. Therefore, we sought to evaluate the experience of vitreoretinal fellows who perform PR at 6 different training sites, across different practice settings and geographic regions in the U.S., to determine the factors associated with anatomic and visual outcomes in this unique cohort of patients.

METHODS:

Patient Selection:

We performed a multicenter, retrospective review of medical records of consecutive patients who underwent PR by vitreoretinal fellows at six training sites across the United States between 2002 and 2016, including Associated Retinal Consultants (Royal Oak, Michigan), Duke University Eye Center, New York Eye & Ear Infirmary, University of California Davis, University of California San Diego, and Wills Eye Hospital. All vitreoretinal fellows were enrolled in a 2-year vitreoretinal fellowship program at the time of the procedures. The study protocol was separately reviewed and approved by each training site's institutional review board, and was conducted in accordance with the tenets of the Declaration of Helsinki and the Health Insurance Portability and Accountability Act (HIPAA). Only one eye was enrolled per subject. All patient and fellow data were de-identified prior to transfer to a central coordinating site for statistical analysis.

We selected patients based on the current procedural terminology (CPT) code 67110 and fellows' activity logs. We enrolled patients who had at least 3-months of clinical follow-up data, and no prior history of trauma or other retinal surgery. Medical records were reviewed to collect demographic and clinical characteristics, including: age, sex, best-corrected visual acuity (BCVA) at presentation, lens status (phakic or pseudophakic), presence of lattice degeneration, presence of vitreous hemorrhage, location of retinal break(s) (superior 8 clock hours versus inferior 4 clock hours), macular involvement of detachment (foveal involvement based on documentation by examining physician), size of RD (less than or greater than 4 clock hours), BCVA at 3 months, and single-procedure success at 3 months, defined as retinal attachment with no additional procedures performed to re-attach the retina. Any additional procedures including repeat PR, PPV, SB, or a combination of these procedures were recorded during the 3-month follow-up. Finally, the vitreoretinal fellow training level (first vs. second year) and procedure experience (number of cases previously performed by the fellow at the time of the procedure) were recorded. Snellen visual acuity measurements were converted to logarithm of the minimum angle of resolution (logMAR) for statistical analysis. The outcomes of a selection of patients from one of the sites has been previously reported.

Statistical analysis:

All data were analyzed using SPSS software version 21.0 (Armonk, NY: IBM Corp.). The Chi-square test was used to compare binary variables and outcomes. Student's t-tests and one-way ANOVA with Bonferroni post-hoc tests were performed for comparison of scale variables. Association of clinical and training factors with single-procedure success was determined using binary logistic regression analysis, and association with visual outcome was evaluated by linear regression analysis. Factors that approached significance on univariate analyses ($P < 0.1$) were used to create a multivariate model to determine the independent association of these factors with procedure outcomes. Results were considered statistically significant if P-values were 0.05 or less.

RESULTS:

Experience of Vitreoretinal Fellows

In this study, we identified 49 vitreoretinal fellows who performed PR procedures at 6 selected training sites in the United States spanning different practice types (academic or private practice), practice settings (urban or suburban/rural) and geographic locations (Northeast, South, Midwest, or West coast), as well as different size of fellowship programs with a median of 2 fellows per year (range 1 – 3). The majority of the procedures were performed by first-year fellows (270 cases, 65.7%) versus second-year fellows (141 cases, 34.3%). The mean number of PR procedures performed by each vitreoretinal fellow during their fellowship training was 8.02 ± 6.13, but this value varied significantly between individual fellows (median 7, range 1–24).

Baseline Patient Characteristics

We included 483 eyes of 483 patients with primary RD who underwent PR by vitreoretinal fellows. Mean age of patients was 63.44 (SD 10.97) years, with more women than men (65.1% vs 34.9%). Mean logMAR BCVA at presentation was 0.66 (SD 0.72; Snellen 20/91). Most eyes were phakic (71.8%), 19% were noted to have lattice degeneration, and vitreous hemorrhage was seen in 11.6% of patients. Almost all subjects had retinal breaks within the superior 8 clock hours (98.9%). Most of the detachments were macula-sparing (61.1%) and less than 4 clock hours in size (54.4%) (Table 1). Not included in this series were 50 eyes due to inadequate follow-up, and 17 eyes due to prior retinal detachment surgery or trauma.

There were no significant differences in baseline patient characteristics between PR cases performed by first and second year fellows ($P > 0.05$ for all groups) except there was a greater proportion of eyes with vitreous hemorrhage treated by second-year fellows (Table 2). Vitreoretinal fellows who had more experience with the procedure performed PR on older patients ($P = 0.001$) and on more pseudophakic patients ($P = 0.01$) (Table 3). These patients also had worse BCVA at baseline ($P = 0.007$).

Factors affecting Anatomic Success

At 3 months after PR, the single-procedure success rate was 66.8%, with no significant difference noted between the outcomes of first- and second-year fellows (61.1% vs. 68.2%; $P = 0.16$)(Table 2). However, there was a trend toward greater anatomic success for fellows who performed more procedures, with single-procedure success rates of 60.3% to 63.2% seen in eyes done in the fellows' first 15 cases, and 86.2% single procedure success in eyes done after fellows performed 16 or more cases ($P = 0.08$) (Table 3).

Univariate regression analyses showed possible associations of anatomic success with phakic lens status ($P = 0.09$), smaller size of detachment ($P = 0.001$), macula-sparing detachment (0.005), and greater procedure experience of the fellow ($P = 0.07$). Based on multivariate regression analysis, phakic eyes ($P = 0.01$), smaller detachments ($P = 0.02$) and fellow's procedure experience ($P=0.01$) were independently associated with anatomic success (Table 4).

Factors affecting Visual Outcomes

The mean logMAR BCVA at 3 months was 0.43 (SD 0.52; Snellen 20/54) with no difference based on the fellows' training level ($P = 0.56$) or procedure experience ($P = 0.31$) (Tables 2 and 3). While univariate regression suggested possible associations of visual outcomes with baseline vision ($P < 0.001$) and macular status ($P < 0.001$), multivariate analysis showed that only baseline BCVA is an independent determinant of visual outcomes ($P < 0.001$) (Table 5).

Outcomes after Pneumatic Retinopexy Failure

Among the 155 eyes that failed initial PR, anatomical success at 3-month follow-up was achieved in 141 eyes (91%). However, the mean logMAR BCVA at 3 months was 0.58 (SD 0.58, Snellen 20/76) in eyes that failed initial PR, which was significantly worse than eyes with single procedure success (mean 0.35 ± 0.48, Snellen 20/44, $p<0.001$). The median number of re-operations was 1 (range 1 – 3), including PPV with or without SB (n = 130, 84.4 %), repeat PR (n = 31, 20.1%), and SB only (n = 17, 11%). The success rate of reoperation ranged between 53.3% to 100% (53.3% for repeat PR, 93.8% for SB, 84% for PPV and 100% for combined SB+PPV), with no significant difference in visual acuity between these secondary procedures (P=0.43–0.97) at 3-months. There were no significant differences in the proportion of additional treatment methods based on fellow training level (P = 0.15) and procedure experience (P = 0.19). 83 out of the 155 eyes (51.0%) that failed initial PR were macula-sparing at presentation, and 15 of these eyes progressed to involve the macula (20%). In this subgroup of patients, logMAR BCVA at 3 months was significantly worse than those that remained macula-sparing at the time of re-operation (0.81 ± 0.71, Snellen 20/129 vs. 0.41 ± 0.54, Snellen 20/51, P = 0.02).

DISCUSSION:

With the rise of small-gauge vitrectomy technology, improved operating room access, and more vitreoretinal surgeries performed under local anesthesia, the use of PR has gradually declined. However, PR is still widely performed in the United States due to its convenience, lower cost, ability to be performed in the office, and favorable risk profile., A recent prospective, randomized study showed that patients who undergo PR for primary RD experienced superior visual outcomes at 1 year compared to those who had PPV. However, the use of PR varies widely among physicians as the decision to employ this technique depends on many factors including practice setting, ease of access to the operating room, and familiarity and experience with PR during fellowship training.

In this study, we report the experience of 49 vitreoretinal fellows from 6 training centers who performed PR, and the outcomes of 483 patients who underwent PR by these fellows. The single-procedure success rate in our series was 66.8%, which is comparable to rates previously reported in the literature from experienced retinal specialists, which ranged from 43.7 −95.5%.– Although the number of PR cases performed by fellows varied between individuals and different training centers, there was no significant difference in anatomic success between first and second year fellows. However, we found that fellows who performed more PR demonstrated better anatomic outcomes, with greater single-procedure success after performing 15 cases (86.2% for >15 cases vs. 60.0–63.2% for ≤15). This is consistent with the notion that PR success depends highly on patient selection, examination and technical skill that would improve with increased experience with the specific technique itself, rather than overall experience as a retinal specialist., The data suggests that closer attending supervision in the first 15 cases performed by fellows may be important to ensure greater success of the procedure.

Among the eyes that failed initial PR, 83 eyes (51.0%) were macula-sparing at baseline, 15 of which (20%) progressed to involve the macula at the time of failure, comparable to rates previously reported in the literature. While prior studies showed that eyes that fail initial PR enjoy a 100% anatomic success rate at 1-year, our study showed a reattachment rate in these failed cases of 91% at 3-month follow-up, likely due to the shorter duration of follow up in our series. In terms of visual outcomes, we found that eyes that failed initial PR performed less well compared to those that achieved single-procedure anatomic success. We also found that eyes with macula-sparing retinal detachments at the time of initial PR had worse visual outcomes at 3-months if the detachments progressed to involve the macula at the time of failure. Along with similar results from recent studies, these lines of evidence suggest that eyes that fail initial PR may have worse clinical outcomes than primary surgical repair, and further emphasizes the need for greater supervision during a trainee's initial cases.

Our findings may be confounded by the exclusion of patients with inadequate follow-up, which may underestimate the number of PR performed by each fellow or their outcomes, assuming that patients who do not follow-up closely are more likely to have achieved anatomic success. Similarly, cases not accurately coded with the CPT 67110 procedure code and cases conducted at other ancillary sites (county hospitals, veteran's affairs hospitals, etc.) were not included in this series. Finally, while the median number of PR cases performed were determined for the entire 2-year training period for most vitreoretinal fellows, 6 fellows who started their training in 2016 (1 year before the end of the study period) only included cases performed in their first year. A more robust, prospective analysis of fellow outcomes may provide greater insight into the relationship between procedure experience and anatomic outcomes.

This study is also limited by its retrospective nature, and the inclusion of different fellowship training sites that may vary in their practice pattern and approach towards PR. Unlike ophthalmology residency programs, vitreoretinal fellowships are not accredited by the Accreditation Council of Graduate Medical Education (ACGME) and fellow experience with less commonly-performed procedures such as PR varies widely between individual programs and is not uniformly monitored. Nevertheless, the training sites sampled in our study extend across different practice settings and geographic locations across the U.S., and may provide important, generalizable insight into how fellowship experience may impact procedure training, fellow performance, and patient outcomes. These data may serve as a road map for assessing outcomes and ultimately designing a more uniform curriculum that includes creation of educational milestones and establishment of entrustable professional activities (EPA's) in vitreoretinal fellowship training.

Acknowledgments

Financial Support: Dr. Yiu is supported by NIH K08 EY026101, E. Matilda Ziegler Foundation for the Blind, Barr Foundation for Retinal Research, Alcon Research Institute, ARVO Foundation, the California National Primate Research Center, and the CITRIS/Banatao Institute. The sponsor or funding organizations had no role in the design or conduct of this research."

Academic Vitreoretinal Training Centers Study Group:

Associated Retinal Consultants: Antonio Capone MD; Kimberly Drenser MD,PhD; Lisa Faia MD; Bruce Garretson MD; Priyanka Gogte MD; Tarek Hassan MD; Alan Ruby MD; George Williams MD; Jeremy D. Wolfe MD,MS; Duke University Eye Center: Dilraj S. Grewal, MD; New York Eye and Ear Infirmary of Mount Sinai: Avnish Deobhakta, MD; Ronald C. Gentile, MD; Meenakashi Gupta, MD; Richard Kaplan, MD; Gennady Landa, MD; Jessica G. Lee, MD; Aryeh L. Pollack, MD; Richard B. Rosen, MD; Fatoumata Yanoga, MD; UC Davis: Parisa Emami-Naeini, MD, MPH; Lawrence S. Morse, MD, PhD; Ala Moshiri, MD, PhD; Susanna S. Park, MD, PhD; Steven Tran; Vivian Vuong, MD; Glenn Yiu, MD, PhD; UC San Diego: Kevin C. Chen, MD; Eric Nudleman, MD; Wills Eye Hospital: Ferhina Ali, MD, MPH; Allen Chiang, MD; Jordan Deaner, MD; Mitchell S. Fineman, MD; Sunir J. Garg, MD; Omesh P. Gupta, MD; Allen C. Ho, MD; Jason Hsu, MD; Michael Klufas, MD; Richard S. Kaiser, MD; Sonia Mehta, MD; Carl H. Park, MD; Carl D. Regillo, MD; Arunan Sivalingam, MD; Marc J. Spirn, MD; James F. Vander, MD

Reference

1. Hwang J Regional practice patterns for retinal detachment repair in the United States. Am J Ophthalmol 2012;153:1125–1128. [PubMed: 22321800]
2. McLaughlin M, Hwang J. Trends in Vitreoretinal Procedures for Medicare Beneficiaries, 2000 to 2014. Ophthalmology. 2017;124(66):667–673. [PubMed: 28283281]
3. Emami-Naeini P, Deanor J, Ali F, et al. A multiceter study of pneumatic retinopexies performed by vitreoretinal fellows. AAO 2017, New Orleans, LA 2017.
4. Ahmad B, Shah G, Blinder K. Trends & Approaches to Repairing Detachment. Review of Ophthalmology. 2013.
5. Goldman D, Shah C, Heier J. Expanded criteria for pneumatic retinopexy and potential cost savings. Ophthalmology. 2014;121(1):318–326. [PubMed: 23953099]
6. Zaidi A, Alvarado R, Irvine A. Pneumatic retinopexy: success rate and complications. Br J Ophthalmol. 2006;90(4):427–428. [PubMed: 16547319]
7. Muni R, Felfeli T, Boghosian K, et al. Randomized Trial Comparing Pneumatic Retinopexy vs. Vitrectomy in the Management of Primary Rhegmatogenous Retinal Detachment (PIVOT): 1-Year Results. ASRS annual meeting, Boston, MA 2017.
8. Chan C, Lin S, Nuthi A, Salib D. Pneumatic retinopexy for the repair of retinal detachments: a comprehensive review. Surv Ophthalmol. 2008;53(443–78). [PubMed: 18929759]
9. Tornambe P Pneumatic retinopexy: the evolution of case selection and surgical technique. A twelve-year study of 302 eyes. Trans Am Ophthalmol Soc. 1997;95:551–578. [PubMed: 9440187]
10. Kulkarni K, Roth D, Prenner J. Current visual and anatomic outcomes of pneumatic retinopexy. Retina. 2007;27(8):1065–1070. [PubMed: 18040246]
11. Anaya J, Shah C, Heier J, Morley M. Outcomes after Failed Pneumatic Retinopexy for Retinal Detachment. Ophthalmology. 2016;123(5):1137–1142. [PubMed: 26952593]
12. Kwan J, Crampton R, Mogensen L, Weaver R, Van der Vleuten C, Hu W. Bridging the gap: a five stage approach for developing specialty-specific entrustable professional activities. BMC Med Educ. 2016;16:117. [PubMed: 27097981]

Author Manuscript

Author Manuscript

Author Manuscript

Outcomes of pneumatic retinopexies performed by vitreoretinal fellows are comparable to reported rates by experienced specialists. Procedure experience of fellows may impact outcomes. These data can be used in designing a more uniform fellowship-training curriculum.

TABLE 1-

Clinical characteristics of patients who underwent pneumatic retinopexy by vitreoretinal fellows at baseline and 3-month follow up

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)

Abbreviations: SD standard deviation; logMAR BCVA: logarithm of minimum angle of resolution of best-corrected visual acuity; RD retinal detachment

TABLE 2 -

Characteristics of patients who underwent pneumatic retinopexy performed by vitreoretinal fellows based on training level.

	First-Year Fellows (n = 262)	Second-Year Fellows (n = 132)	P-value
	Baseline		
Mean Age (SD)	63.25 (10.97)	63.89 (10.88)	0.59
Sex			0.35
Female	177 (67.6%)	83 (62.9%)	
Male	85 (32.4%)	49 (37.1%)	
Mean LogMAR BCVA (SD)	0.70 (0.74)	0.71 (0.76)	0.87
Lens status			0.41
Phakic	192 (73.3%)	90 (68.2%)	
Pseudophakic	69 (26.3%)	42 (31.8%)	
Lattice degeneration	55 (21.1%)	28 (21.2%)	0.97
Vitreous hemorrhage	23 (8.8%)	22 (16.7%)	0.02 *
Macula status			0.30
Attached	148 (56.7%)	82 (62.1%)	
Detached	113 (43.3%)	50 (37.9%)	
Size of RD			0.99
<4 clock hours	136 (52.3%)	124 (47.7%)	
≥4 clock hours	69 (52.3%)	63 (47.7%)	
	3-Month Follow-Up		
Mean LogMAR BCVA (SD)	0.49 (0.55)	0.45 (0.57)	0.56
Single-procedure Success	160 (61.1%)	90 (68.2%)	0.16
Mean # re-operations (SD)	1.23 (0.44)	1.14 (0.47)	0.29

* Statistically-significant, $P < 0.05$

Abbreviations: SD standard deviation; logMAR BCVA: logarithm of minimum angle of resolution of best-corrected visual acuity; RD retinal detachment

TABLE 3-

Characteristics of patients who underwent pneumatic retinopexy performed by vitreoretinal fellows based on procedure experience of the fellow.

	Group 1 (Cases 1–5) (n=212)	Group 2 (Cases 6–10) (n=106)	Group 3 (Cases 11–15) (n=63)	Group 4 (Cases ≥ 16) (n=29)	P-value
BASELINE CHARACTERISTICS					
Mean Age (SD)	61.24 (11.91)	65.03 (10.38)	66.34 (8.49)	65.68 (9.50)	0.001 *
Mean logMAR BCVA (SD)	0.70 (0.74)	0.65 (0.71)	0.53 (0.66)	1.11 (0.90)	0.007 *
Lens status					0.01 *
Phakic	166 (78.3%)	71 (67.0%)	42 (66.7%)	16 (55.2%)	
Pseudophakic	46 (21.7%)	35 (33.0%)	21 (33.3%)	13 (44.8%)	
Lattice degeneration	44 (21.0%)	20 (18.9%)	14 (22.2%)	6 (20.7%)	0.95
Vitreous hemorrhage	24 (11.3%)	10 (9.4%)	8 (12.7%)	5 (17.2%)	0.68
Macula status					0.26
Attached	116 (55.0%)	66 (62.3%)	41 (65.1%)	20 (69.0%)	
Detached	95 (45.0%)	40 (37.7%)	22 (34.9%)	9 (31.0%)	
Size of RD					0.86
<4 clock hours	103 (51.0%)	48 (54.7%)	32 (49.2%)	16 (55.2%	
≥4 clock hours	103 (49.0%)	48 (45.3%)	32 (50.8%)	13 (44.8%)	
3-MONTH FOLLOW-UP					
Single-procedure success	134 (63.2%)	67 (63.2%)	38 (60.3%)	25 (86.2%)	0.08
Mean logMAR BCVA (SD)	0.45 (0.51)	0.47 (0.56)	0.45 (0.56)	0.60 (0.71)	0.57
Mean # reoperations (SD)	1.24 (0.46)	1.23 (0.54)	1.08 (0.27)	1.0 (0)	0.33

*Statistically-significant, P < 0.05

Abbreviations: SD standard deviation; logMAR BCVA: logarithm of minimum angle of resolution of best-corrected visual acuity; RD retinal detachment

TABLE 4 -

Factors associated with single-procedure success after pneumatic retinopexy by vitreoretinal fellows at 3 months

Univariate Regression			
	OR	**95% CI**	**P-Value**
Age			0.22
LogMAR BCVA			0.50
Sex (Male)	0.86	0.57–1.29	0.47
Lens status (Pseudophakia)	0.70	0.46–1.06	0.09#
Lattice degeneration (Present)	1.08	0.91–1.29	0.31
Vitreous hemorrhage (Present)	1.07	0.87–1.33	0.46
Inferior breaks (Present)	0.99	0.97–1.01	0.73
Size of detachment (≥4 clock hours)	0.52	0.35–0.76	0.001*
Macula status (Attached)	1.74	1.18–2.56	0.005*
Training level (2nd year)	1.36	0.88–2.09	0.16
Procedure experience (≥16 cases)	1.52	1.00–2.32	0.07#
Multivariate Regression			
	OR	**95% CI**	**P-Value**
Lens status (Pseudophakia)	0.56	0.35–0.90	0.01*
Size of detachment (≥4 clock hours)	0.57	0.35–0.92	0.02*
Macula status (attached)	1.32	0.80–2.16	0.26
Procedure experience (≥16 cases)	4.23	1.38–12.95	0.01*

*Statistically-significant, P < 0.05,

#P < 0.1

Abbreviations: logMAR BCVA, logarithm of minimum angle of resolution of best corrected visual acuity; OR odds ratio; 95% CI 95% confidence interval; SE standard error

TABLE 5 -

Factors associated with visual acuity outcomes after pneumatic retinopexy by vitreoretinal fellows at 3 months

Univariate Regression			
		P-Value	
Age		0.24	
LogMAR BCVA		<0.0001 *	
Sex (Male)		0.08#	
Lens status (Pseudophakia)		0.57	
Lattice degeneration (Present)		0.71	
Vitreous hemorrhage (Present)		0.42	
Inferior breaks (Present)		0.35	
Size of detachment (≥4 clock hours)		0.22	
Macula status (Attached)		<0.001 *	
Training level (2nd year)		0.50	
Procedure experience (≥15 cases)		0.33	
Multivariate Regression			
	Estimate	SE	P-Value
LogMAR BCVA	0.25	0.03	<0.001 *
Sex (Male)	−0.67	0.04	0.16
Macula status (Attached)	−0.03	0.05	0.44

*Statistically-significant, $P < 0.05$,

#$P < 0.1$

Abbreviations: logMAR BCVA, logarithm of minimum angle of resolution of best-corrected visual acuity