

## Introduction

Proliferative vitreoretinopathy (PVR) is found in 75% of re-detachments after pars plana vitrectomy (PPV) surgery for rhegmatogenous retinal detachment (RRD) repair and is considered a major barrier for surgical success for such patients.<sup>1</sup> Incomplete removal of the anterior hyaloid membrane (AHM) may facilitate anterior PVR formation or anterior hyaloidal fibrovascular proliferation (AHFP),<sup>2-7</sup> which may result in subsequent tractional retinal detachment (TRD) or ciliary body detachment.<sup>3-6,8,9</sup> On the other hand, residual anterior vitreous after PPV may contribute to blockage of glaucoma drainage implantation placed through the pars plana, and subsequently increase intraocular pressure.<sup>10,11</sup> In such patients, prophylactic surgical removal of the AHM may be beneficial.

## Purpose

Complete removal of the AHM during vitreoretinal surgery can be challenging and may result in ocular complications. This study investigates the feasibility and clinical outcome of endoscopy-assisted pneumatic dissection of the AHM.

## Methods

This is a retrospective comparative cohort study of adult patients who underwent endoscopy-assisted PPV (EA-PPV) at the University of Kansas Medical Center (KUMC) between August 2017 and May 2018. Data was collected from 3 points in time: preoperative visit, 1-month follow-up visit, and longest follow-up visit as of December 2018. Data collection included age, gender, visual acuity (VA), intraocular pressure (IOP), lens status, clinical outcome, and adverse events. A series of independent sample t-tests and independent sample tests of proportion were conducted to compare these measures between the two groups.

Microsoft Excel was used for data collection and RStudio was used for statistical analysis. A p-value of .05 was used as the cut-off for significance in all tests. VA was converted to logMAR for analysis using the equation  $[\log\text{MAR VA} = -\log(\text{decimal acuity})]$ .<sup>12</sup> The KUMC institutional review board approved this study.

## Financial Interests

- None to disclose

## Results

- 44 patients met the inclusion criteria for the study (27 underwent AHM pneumatic dissection, and 17 did not undergo AHM pneumatic dissection).
- Endoscopy-assisted AHM pneumatic dissection was achieved in all 27 patients who underwent this procedure.
- In the EA-PPV with AHM pneumatic dissection group, five patients had air bubbles escape into their anterior chambers, which were removed intraoperatively via aspiration and injection of balanced salt solution. One patient had cataract acceleration at the 1-month postoperative visit, with a final VA of 20/20 after cataract extraction. Another patient had a postoperative suprachoroidal hemorrhage that needed to be drained, with a final VA of 20/30.
- Three patients in the EA-PPV without AHM pneumatic dissection group had recurrent tractional retinal detachments, postoperatively.

### STUDY DEMOGRAPHICS

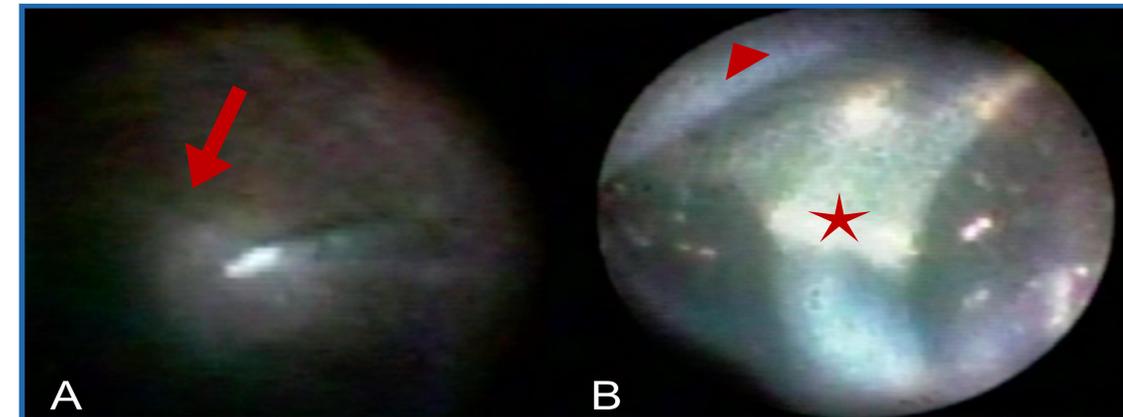
	EA-PPV + AHM (27 eyes)	EA-PPV (17 eyes)	P-value
Age (years)	61.67 ± 12.45	59.88 ± 13.74	0.67
Gender (%)	40.74% Female 59.26% Male	52.94% Female 47.06% Male	0.63
Phakic eyes (%)	66.67%	41.12%	0.18
Pseudophakic eyes (%)	33.33%	47.06%	0.55
Aphakic eyes (%)	0.00%	11.76%	0.28

**Table 1. Demographics of each study group.** Categorical data is shown as percentages. Continuous data is shown as means and standard deviations. P-values for categorical data are from independent sample tests of proportion. P-values for continuous data are from independent sample t-tests. Endoscopy-assisted pars plana vitrectomy with anterior hyaloid membrane pneumatic dissection (EA-PPV + AHM). Endoscopy-assisted pars plana vitrectomy without anterior hyaloid membrane pneumatic dissection (EA-PPV).

### ADVERSE EVENTS

	EA-PPV + AHM (27 eyes)	EA-PPV (17 eyes)	P-value
Intraoperative Air Bubble Migration into Anterior Chamber (%)	18.52%	0.00%	0.16
Postoperative Cataract Progression (%)	3.70%	0.00%	1.00
Postoperative Delayed Suprachoroidal Hemorrhage (%)	3.70%	0.00%	1.00
Postoperative Retinal Detachment (%)	0.00%	17.65%	0.10
Combined Total Postoperative Complications (%)	7.41%	17.65%	0.58

**Table 2. Adverse events in each study group.** Endoscopy-assisted pars plana vitrectomy with anterior hyaloid membrane pneumatic dissection (EA-PPV + AHM). Endoscopy-assisted pars plana vitrectomy without anterior hyaloid membrane pneumatic dissection (EA-PPV).



**Figure 1. Intraoperative endoscopic view during anterior hyaloid membrane dissection.** (A) Endoscopic view showing a 30-gauge needle passing through the pars plana above the AHM. (B) Endoscopic view during AHM pneumatic dissection with the needle inside the filtered air bubble, which is expanding between the AHM and the natural lens at the top. Arrow (AHM). Star (air bubble between lens and AHM). Arrow head (lens).

## Conclusions

The study showed that endoscopy-assisted AHM pneumatic dissection via the canal of Petit is a feasible surgical technique. However, adverse events, such as cataract progression, delayed suprachoroidal hemorrhage, or intraoperative air bubble migration into the AC can occur. Larger prospective, and long-term studies are needed to better elucidate AHM pneumatic dissection outcome in patients undergoing PPV.

## References

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