STUDY OBJECTIVES

This is a randomized, controlled trial evaluating the safety and efficacy of YAG vitreolysis for symptomatic Weiss ring due to posterior vitreous detachment. This is a single-center trial that will take place at Harbin Aier Eye Hospital. Patients will be randomized to YAG vitreolysis and control.

STUDY DESIGN

Patients complete questionnaires at baseline, week 1, month 1, month 3 and month 6 regarding: duration of their symptoms prior to presentation, laterality, severity and number of their floaters, and activity most inconvenienced by the presence of floaters. These data, along with age, sex, and lens status, will serve as baseline characteristics.

The first questionnaire was a 10-point visual disturbance score as described by Singh[1] (with 0 being asymptomatic and 10 indicating impairing symptoms). The second was a short questionnaire of 4-degree floater symptoms (Table 1) described by Tassignon[2] to classify the degree of patients disturbed by floaters. Based on total scores, patients were classified as having no discomfort (score ≤ 1), mild discomfort ($1 <$ score ≤ 4), moderate discomfort ($4 <$ score ≤ 7), or manifest discomfort (score > 7). The third was a 4-level qualitative scale of symptoms improvement described by Delaney et al.[3]. The patients were asked to quantify their post-operative improvement as a percentage. The options were: (1) the same: 0-30%; (2) partial success: 30-50%; (3) significant success: > 50%; (4) complete success: 100%. The last was Visual Functioning Questionnaire-25 (VFQ-25).

Table 1. 4-degree floater symptoms questionnaire

Statement	Score*	Weight	Weighted Score†
I have noticed my floaters in everyday life.	…/4	0.25	…/1
I am sometimes irritated by my floaters.	…/4	1	…/4
I am sometimes frustrated by my floaters.	…/4	1	…/4
I often stay indoors because of my floaters.	…/4	1	…/4
Total score			…/13

*Score 0: strongly disagree; 1: disagree; 2: not sure; 3: agree; 4: strongly agree.
†Weighted score: score multiplied by weight.

Snellen best-corrected visual acuity (BCVA) will be checked at baseline, week 1, month 1, month 3, and month 6. A B-scan will be performed at baseline to confirm the presence of a PVD and measure the distance of the symptomatic Weiss ring floater from the retina and

posterior lens capsule. Spectralis Optical Coherence Tomography (OCT) and infrared photo (Heidelberg Engineering, Germany) will be checked at baseline and month 6. Optos (Scotland, UK) color photography will be checked at baseline and month 6. A slit lamp and indirect ophthalmoscope examination with scleral depression will be performed at baseline, week 1, month 1, month 3, and month 6, along with non-contact intraocular pressure.

The YAG vitreolysis will be performed using an Ellex laser.

YAG LASER PROCEDURE

1. Verify study eye.

2. Instill 1 drop phenylephrine 2.5% and tropicamide 1%into the study eye.

3. Fill Karickoff lens half-way with goniosol.

4. Single shot mode with a maximum pulse energy of 7 mJ per pulse. The treating physician will start at 1 mJ and titrate up until he/she reaches enough power to achieve disruption of the Weiss ring.

5. The endpoint of treatment is the disruption of the Weiss ring into smaller fragments as well as any other vitreous opacities deemed visually significant by the treating physician. Onlyone treatment session will be performed.

6. At the end of the treatment: record total energy (in mJ), energy per shot (in mJ), and total number of shots

7. Obtain IOP 30 minutes after treatment

Inclusion Criteria

1. Symptomatic vitreous opacities owing to complete PVD (Weiss ring), symptoms for at least 3 months with clear optical media.
2. The distance between floaters and retina or lens was over 3mm (measured by B-scan ultrasound)
3. The 10-point visual disturbance score at least 4.
4. Ability to undertake YAG laser procedure.
5. Acceptance of related risks.

Exclusion Criteria

1. Snellen BCVA was worse than 20/50.

2. Eyes with intraocular lens (IOL).

3. Less than 50% of the Weiss ring was ablated after one treatment (objective changes were evaluated by the surgeon who performed the YAG laser vitreolysis)

4. Patients with a history of glaucoma, severe cataract, vitreous hemorrhage, retinal disease, macular disease.

1. Singh, I. P. YAG laser vitreolysis. Presented at the Annual Meeting of the European Society of Cataract and Refractive Surgery, 14 September 2014, London, England.
2. Tassignon, M. J., Ni Dhubhghaill, S., Ruiz Hidalgo, I. & Rozema, J. J. Subjective Grading of Subclinical Vitreous Floaters. *Asia Pac J Ophthalmol (Phila)* **5**, 104-109, doi:10.1097/APO.0000000000000189 (2016).
3. Delaney, Y. M., Oyinloye, A. & Benjamin, L. Nd:YAG vitreolysis and pars plana vitrectomy: surgical treatment for vitreous floaters. *Eye* **16**, 21 (2002).