The following treatment guidelines are provided for information purposes only. It is the operating physician’s responsibility to familiarize themselves with the latest recommended techniques. Ellex strongly recommends that physicians new to the technique undertake extensive education/training in vitreolysis.

Options for Management of Vitreous Strands/Opacities:

1. Do nothing. Reassure: “try to live with it”.
2. YAG Laser Vitreolysis
3. Floater-Only Vitrectomy
   (Rarely offered due to high risk profile.)

Equipment Requirements:

- An Nd:YAG laser optimized for use in the posterior segment, in addition to use in the anterior segment, is recommended for vitreolysis.
  Note: Not all YAG lasers are adequately designed for use in the vitreous chamber. In order to visualize the vitreous strand/opacity and target accordingly, the illuminating light source must be positioned at the same vertical optical axis as the oculars and laser energy beam. Most YAG lasers use a lower angle of illuminating light, well-suited to common anterior procedures but ill-equipped for use in the vitreous. For example, if light enters the eye at an angle that differs markedly from the visual axis of the operating physician it will only illuminate the anterior parts of the visual axis. Consequently, vitreous strands/opacities positioned in the posterior vitreous will be difficult to visualize (and treat). In contrast, a raised illumination tower can overcome these issues. It is important to note, however, that this may carry a risk of attenuating the treatment beam energy. Provisions must therefore be made to ensure this does not affect treatment.

- A lens specially designed for treating in the vitreous, such as the Ocular Karickhoff Vitreous 21mm Lens.
  Note: The choice of lens will depend on the position of the structure to be treated. It is important to note that the commonly available Goldmann lens is not suitable for treating vitreous strands/opacities.

Patient Selection:

1. Patients reporting persistent moving shadows in their vision due to vitreal condensations, fibers, strands, and clouds:
   a. Not associated with active retinal pathology.
   b. Not associated with active inflammation.
   c. Present for 2-3 months and stable in behaviour.
   d. Absence of peripheral flashes of light suggesting an incomplete posterior vitreous detachment.
Patient Selection (continued):

2. Other important age-based considerations:
   a. Older patients (>45-50) with sudden-onset symptoms will most likely have experienced a posterior vitreous detachment (PVD).
   b. Younger patients may bitterly complain of their vitreous strands/opacities, but they are least likely to be candidates for treatment. They often have microscopic floaters located within 1-2 mm of the retina.
   c. Vitreous strands/opacities which have been present for 2-3 months and that which are stable in behaviour.
   d. Absence of peripheral flashes of light, which indicates an incomplete PVD.

3. For your first patients:
   a. It is recommended to choose the well-defined, fibrous, Weiss-ring type of vitreous strand/opacity caused by a PVD. These are usually located safely away from the crystalline lens and the retina. They often behave as if “tethered” by the sheet of vitreous cortex of which they are a part. Because they are fibrous, they absorb the laser energy well and can be vaporized more efficiently.
   b. The diffuse, cloud-like syneresis type of vitreous strand/opacity is much more difficult to visualize and efficiently treat. Although it can be treated, these treatments should be undertaken only once sufficient experience with YAG laser vitreolysis has been gained.
   c. Vitreous strands/opacities which have been present for 2-3 months and that which are stable in behaviour.
   d. Absence of peripheral flashes of light, which indicates an incomplete PVD.

4. For new users, it is recommended to initially limit treatment to pseudophakic patients. However, patients with multi-focal lenses may be more difficult to treat due to the refocusing of the aiming beams.

5. Although the risk of an acute elevation of IOP is rare, patients undergoing treatment for glaucoma, or with high-borderline IOPs and anterior-located dense floaters, should not undergo vitreolysis treatment.

Before Getting Started:
It is important to manage patient expectations and to set realistic treatment outcomes:

- The goal of treatment is to achieve a “functional improvement”. That is, to allow the patient to return to their “normal, day-to-day” activities without the hindrance of their vitreous strands/opacities.
- The patient should not expect to achieve a 100% clear vitreous (as can sometimes be the outcome with vitrectomy).
- Some vitreous strands/opacities can be easily and efficiently treated; some vitreous strands/opacities cannot be treated.
- Often more than one treatment session will be needed in order to achieve a satisfactory result. It is also important to note that, on average, a treatment session can take from 20 - 60 minutes.

Pre-Treatment:
1. Full dilated eye examination with attention to retina and periphery. Aggressive dilation with both tropicamide and phenylephrine is recommended. Every millimeter of dilation will be beneficial.
2. Personal discussion with the patient establishing appropriate expectations and discussion of the risks of the procedure.
3. Topical anesthetic with 2-3 instillations a few minutes apart.

Treatment:
The treatment spot size and pulse width are fixed at 8 microns and 4 ns respectively. The only parameters that will vary are the energy of the pulse and the number of pulses fired in one shot i.e. single, double, or triple.

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Vitreolysis

Anterior and Posterior Offset:

- It is possible to position the optical breakdown in front of (anterior offset) or behind (posterior offset) the structure to be vaporised. When the energy is increased, the optical breakdown and resulting plasma move closer to the operating physician. The offset capability permits greater accuracy in positioning the optical breakdown.

- When working deeper in the posterior vitreous, chromatic aberration will focus the treatment beam further behind the aiming beam. Use the anterior offset to position the optical breakdown in the same plane as the aiming beam focus. This is particularly critical when working close to the retina.

- Note: Some physicians prefer to manually defocus the system with the joystick rather than via the Anterior/Posterior offset control.

Post-Treatment:

1. Generally, post-treatment medications are not necessary.
2. No restrictions on activities.
3. Patient may see small, dark, specks in the lower field of vision for the first 15-30 minutes after the procedure. These are small micro-gas bubbles at the roof of the globe. They dissolve quickly and disappear.
4. Patients cannot adequately assess the treatment results until the pupils have constricted back to normal.
5. It is recommended that the patient follow up the next day for visual acuity and IOP testing.
6. Follow up treatments can be done on consecutive days although there may be an advantage to waiting a few or several days for the condition to stabilize.
7. In very rare cases, inflammation of the anterior segment may be observed. In the unlikely event that this occurs, it can be treated with non-steroidal anti-inflammatories such as acular or a steroid such as pre forte for a few days.

Side Effects and Complications:

Reported side effects and complications are rare, particularly when the treatment is performed by practiced physicians. Side effects may include:

- Accidental retina hit or shock-wave contusion of retina or sub-retinal tissues. In the periphery, this could be asymptomatic. Avoid treating over the macula in the posterior 1/3 of the vitreous.

- Retinal detachment. While this is worth mentioning in the consent form, retinal detachment related to YAG laser treatment of vitreous strands/opacities has not been reported in 20 years of vitreolysis experience.

- Traumatic cataract. May have rapid-onset of symptoms if there is a breach of the posterior capsule. It may make cataract surgery more urgent and more complicated.

- Increased intraocular pressure. Rare, but more likely in older patients with compromised trabecular meshwork drainage combined with treating dense, vitreous strands/opacities in the anterior segment.

- Uveitis.