

Vitreomacular traction: natural course vs. vitrectomy vs. ocriplasmin

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Over time, the vitreous gel completely separates from the retina in a process known as a posterior vitreous detachment (PVD). In some instances, however, the vitreous does not detach entirely and remains adherent to the macula. The term vitreomacular traction (VMT) refers to vitreous pulling on the macula as it continues to shrink and pull away [1]. Treatment options include observation, pars plana vitrectomy (PPV) or intravitreal ocriplasmin (Jetrea™, Alcon Laboratories, UK); a drug that was approved by the National Institute for Health and Care Excellence (NICE) in 2013 but recently discontinued in the NHS for business reasons in May 2020 [2].

Pathogenesis

The vitreoretinal interface is formed where adhesion molecules (fibronectin, heparin sulphate and laminin proteoglycans) create vitreous cortex fibres that attach the vitreous body to the internal limiting membrane of the retina [3]. These attachments are strongest at the optic disc, fovea, along major retinal blood vessels, and the vitreous base [1]. Through the process of ageing, the vitreous body liquefies and loses volume. Fluid-filled lacunae cause syneresis of the vitreous body and subsequent detachment from the retina. Detachment can be incomplete at sites where the vitreous is more adherent, such as the macula. Vitreomacular adhesion (VMA) refers to this process and if sustained, it can lead to VMT [1]. Due to contraction of the vitreous causing traction at the macula, patients typically present with metamorphopsia and visual distortion. If vitreous syneresis continues, this can progress to a macular hole [4].

Observation as a treatment option

For patients with mild VMT or minimal symptoms, observation may be a viable option. This approach is often chosen when the condition is not causing significant visual impairment and does not pose an immediate threat to the patient's health or quality of life. There are several factors that may influence the decision to observe rather than treat. These include age, existing ophthalmic conditions and the severity of symptoms.

Younger patients with minimal symptoms and a lower risk of progression may be good candidates for observation. A cohort study of 230 eyes of 185 patients with VMT showed that spontaneous release of VMT occurred in 31.9% of eyes at a mean of 18 months after initial visit; however, most eyes were graded as mild (VMT grade 1) [5]. If the condition worsens or the patient becomes more symptomatic, of course a different treatment may be considered.

Vitrectomy: a definitive solution

For the most part, vitrectomy has been the only treatment for VMT, usually reserved for progressive and symptomatic cases. The surgery removes adhesions between the posterior vitreous and macula, but it carries its own risks. There is often a guarded prognosis, making patients anxious about their visual outcome [6]. The surgery involves removal of the vitreous gel with careful attention to protect the retina from tearing and refilling the cavity with gas to maintain the shape and intraocular pressure of the eye. Recovery is gradual as the gas and air bubble clear with time, but full resolution of vision is not always a guarantee. In cases where the condition has progressed to a full-thickness macular hole (FTMH), vitrectomy remains the best option. For mild to moderate cases, there is a debate as to whether such invasive ocular surgery is worth the risks associated with postoperative visual recovery [4]. A systematic review and meta-analysis of PPV for VMT found that gains in visual acuity after surgery were modest and these may not be indicative of symptomatic relief [7].

Ocriplasmin: a pharmaceutical intervention

Between 2013 and 2020, ocriplasmin was licensed by NICE in the UK for use on patients with VMT and FTMH as a result of VMT. Ocriplasmin is a recombinant, truncated proteolytic enzyme that breaks down adhesions of fibronectin and laminin in the vitreous gel at the vitreoretinal interface at the macula [8]. Subgroup analysis from two randomised control trials looking at the efficacy of a single dose of ocriplasmin in patients with VMT

+/- FTMH found that outcomes were significantly better than the placebo group [9]. Compared to PPV, the risks associated with ocriplasmin are the same as those for any other intravitreal injection. The drug itself carries rare side effects such as phacodonesis, lens subluxation and dyschromatopsia [4]. The NICE guidelines for the use of ocriplasmin recommended use in patients with severe symptoms. They did not recommend its use in patients with an epiretinal membrane (ERM) and if there was a FTMH, it must be at least 400µm in diameter. The diameter of VMA is also an important factor to influence efficacy since the drug cannot dissolve membranes. Since the introduction of optical coherence tomography (OCT), our understanding of the disease process of PVD through imaging of the vitreoretinal interface has guided management of conditions like VMT [1]. A retrospective observational case series of 25 patients at Moorfields Eye Hospital (MEH) found that if patient selection is carried out in strict accordance with NICE guidance, resolution of VMT with ocriplasmin shows better outcomes than many studies on surgical management and observation. In addition, it is a less invasive procedure with a quicker recovery than surgery. For business reasons, however, this drug was removed from NICE guidance and is therefore not offered anymore in the UK.

Factors influencing treatment selection

The choice of treatment for VMT is not one size fits all and depends on several factors that must be carefully considered by both the patient and the doctor. The extent of VMT plays a crucial role in determining the appropriate treatment. Milder cases may be managed with observation, while more severe cases often require PPV. Younger patients may be more suitable candidates for observation due to their potentially longer life expectancy and the desire to avoid surgery if possible. The impact of VMT on a patient's daily life is also a significant consideration. If the symptoms are severely affecting their quality of life or visual function, PPV may be a more suitable choice. Similarly, if they do not have an ERM and little VMA, the surgical outcome

may be more successful. The presence of other eye conditions or systemic comorbidities can influence treatment decisions. Some patients may have ocular conditions that make surgery riskier, while others have systemic conditions or frailty, deeming them unsuitable for anaesthesia. Patients with pre-existing cataracts may opt for a combined PPV and cataract operation. Patient preference and comfort with different treatment modalities also plays a role in the decision-making process. Some individuals may be averse to surgery and prefer to be observed. Most of the work to date on ocriplasmin found beneficial outcomes, so maybe it could make a return one day [1,4].

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