Editorial

Non-surgical treatment of vitreomacular traction and macular hole

Tratamiento no quirúrgico de la tracción vitreomacular y del agujero macular

L. Arias Barquet

Sección de Retina Médico-Quirúrgica, Servicio de Oftalmología, Hospital Universitario de Bellvitge, Bellvitge, Barcelona, Spain

Macular hole (MA) is a significant cause of visual acuity (VA) loss in patients over 50 years in our environment. The traction by the vitreous, particularly the posterior hyaloids, on the retina surface plays a leading role in the etiopathogenesis of MA.

The collagen fibers that comprise the posterior vitreous are firmly joined to the macula and connecting to the internal limiting membrane by means of a sort of biological adhesive made up by proteoglycans, laminin and fibronectin. With aging, the vitreous gel becomes progressively liquid and vitreoretinal adherence weakens to the point that the vitreous detaches from the retina, known as posterior vitreous detachment (PVD). However, PVD may not be complete: a portion of the vitreous may remain adhered to the macular surface, which is known as vitreomacular adhesion (Fig. 1). When the traction increases due to anteroposterior or tangential stress, vitreomacular traction (VMT) takes place. VMT can be asymptomatic in the form of metamorphopsia and loss of central VA (Fig. 2). In addition, VMT can produce cystic spaces in the retina and involve the formation of MA.

Typically, MA is classified in 4 stages depending on partial thickness without involving the external layers (i), full thickness with VMT (ii), full thickness without VMT and without PVD (iii) and full thickness without VMT and with PVD (iv) (Fig. 3).

In the treatment of MA, observation is recommended with frequent supervision for stage 1, while surgery is recommended for the remaining stages. At present, recommended surgical treatment consists of microincision 25 or 23 g posterior vitrectomy, posterior hyaloids dissection, internal limiting membrane peeling and short duration gas tamponade. Most surgeons recommend post-surgery rest in prone position during 5–7 days, which is not comfortable and not easy to comply with for older patients. Similarly, this surgery is not technically simple and is not free of complications such as endophthalmitis, retina detachment and cataracts.

In recent years, enzymatic vitriolysis with drugs capable of digesting the molecules which are responsible for VMT has been tested. Clinical trials with hyaluronidase dispase and chondroitinase have been discarded due to lack of efficacy or safety. Ocriplasmin (previously known as microplasmin) is a recombinant form of human plasmin serineprotease with proteolytic activity against laminin and fibronectin, two of the main components of the vitreoretinal interface. Preclinical and clinical trials have demonstrated that ocriplasmin can induce the formation of PVD with the ensuing resolution of TVM.

Recently, the results of 2 multicenter phase 3 clinical trials comparing the results of a single 125 µg injection of ocriplasmin against placebo injections in patients with symptomatic VMT have been published. Said trials included 652 eyes, 464 treated with ocriplasmin and 198 with placebo. VMT was resolved in 26.5% of cases treated with ocriplasmin against 10.1% of those treated with placebo (p < 0.001). It must be noted that 14.6% of the cases treated with ocriplasmin and 10.6% of
cases treated with placebo injection \( (p < 0.001) \) achieved non-surgical closure of the MA. In addition, complete PVD was observed in 13.4% of patients treated with ocriplasmin and in 3.7% of those treated with placebo \( (p < 0.001) \). The ocriplasmin injection was demonstrated to be safe, without significant adverse effects being observed.7

Said results open up new options in the treatment of symptomatic VMT and MA. For the first time a pharmacological treatment can make vitrectomy unnecessary. Even though said surgery has very good results for treating said macular disorder, the above commented complications are a cause of concern. In addition, the repercussions for patients and the health system of resolving a disease with a complex surgical procedure or an intravitreal injection, which can be carried out in a clean outpatient practice, are completely different. On the other hand, this will enable ophthalmologists with training in medical retina but with little experience in surgical retina to treat these patients who, until now, must be referred to a hospital with retina and vitreous surgery. It is clear that this will facilitate faster treatments after diagnosis, which would have a positive impact on the end results. As in other maculopathies, early diagnosis and treatment are crucial to obtain good results to preserve visual function as much as possible.

Initially, intravitreal ocriplasmin (JETREA®, Alcon Laboratories, Fort Worth, TX, USA) shall be used in a primary VMT cases, including small size macular holes (<400 μm). However, its application will also be researched for VMT cases that are concurrent with other diseases such as exudative age-related macular degeneration (ARMD), diabetic retinopathy and pathological myopia. It seems that, in what concerns exudative ARMD, there is evidence that in some cases VMT could prevent the resolution of the presence of intraretinal

Fig. 1 – Vitreomacular adhesion.

Fig. 2 – Vitreomacular traction.

Fig. 3 – Macular hole: (A) stage I, (B) stage II, (C) stage III and (D) stage IV.
or subretinal fluid after the injection of anti-VEGF (vascular endothelial growth factor) drugs.  

Due to recent developments in research and the efforts of the pharmaceutical industry, ophthalmologists are able to increase the therapeutical range and accordingly the possibility of providing more and better services to our patients.

REFERENCES