Spontaneous Enlargement of Lamellar Macular Hole. Case Report

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Abstract
The authors report a case presenting an spontaneous progressive enlarging lamellar macular hole through serial quantification by optical coherence tomography during a four year follow-up.

Key words: enlarging hole, lamellar, macular

Introduction
Lamellar macular holes (LMH) were recognized by de Schwinitz in 1904, then by Duke Elder and Gass as a foveal lesion resulting from cystoid macular edema especially after cataract extraction. LMH is defined as a partial thickness macular hole where the inner layers of the fovea face traction are detached from the underlying cellular layers of the fovea leaving the photoreceptor layer frequently intact. Besides vitreoretinal traction, LMH are associated with high myopia, aging, trauma (accidental or surgical), cystoid macular edema and inflammatory or degenerative conditions.4-6 LMH, acute or chronic have diverse shape and size according to extension and depth. Tissue loss influences symptomatology, for example, metamorphopsia and visual drop depend on the continuity of external limiting membrane (ELM) and the status of the ellipsoid zone (junction of outer and inner segments of the photoreceptor cells).12,18 Optical coherence tomography (OCT) reveal the anatomic changes that occur during macular hole formation, progression and enlargement facilitating our understanding of the pathophysiology involved and functional results.7-11

Case Report
In 2002, a 68-year-old male with myopia of -4.50 diopters in both eyes presented with visual acuity of 20/40 due to senile cataracts. Uncomplicated phacoemulsification and foldable intraocular lens implantation was performed in his left eye in 2003 and in his right eye in 2005 with postoperative visual acuity 20/20 in both eyes. In 2005, best-corrected visual acuity (BCVA) decreased to 20/80 in the left eye attributable to significant posterior capsule opacification. Posterior capsulotomy was performed with Nd: YAG laser improving visual acuity to 20/20. In 2009, four years after the capsulotomy, patient noticed a decrease in visual acuity and metamorphopsia. TD-OCT examinations of his left eye in 2009 and 2010 found a lamellar macular hole, posterior vitreous detachment, chronic macular edema and epiretinal macular membrane (ERM) with visual acuity 20/50 that later on improved to 20/30 (Figures 1A, 1B, 1C).

Patient returned in 2011 with a decreased visual acuity 20/80 in his left eye. SD-OCT in 2011 – 2012 found enlargement and change in morphology of LMH (Figures 1D, 1E) and a normal continuity of the external limiting membrane. In January 2013 his left eye had improved visual acuity again to 20/30 with correction (-1.00 cylinder at 90 degrees) that was maintained during the next seven months.

One of the authors (MV) made a four-year retrospective quantification of the lamellar macular hole area: extension at the apex, extension at the base and foveal thickness. Optical coherence tomography measurements performed between 2009 and 2010 were

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Figures 1D, 1E. Lamellar macular hole measurements (SD-OCT, 2011-2012)

made with time domain OCT (Figures 1A, 1B, 1C) and between 2011 and 2012 with spectral domain OCT (Figures 1D, 1E). In addition, epiretinal proliferation has been found and measured (Figure 1F) an association recently reported with lamellar macular holes.19 The contra lateral right eye showed on OCT in 2011 a foveal thickness reduced to 126 microns associated with myopia, under observation through a normal posterior capsule.

Discussion

The typical shape of LMH is similar to that of macular cysts before rupture and the resulting retinal holes may remain without change or can increase in size.10,11 Increase in the extension and depth of LMH may damage the continuity of ELM and the ellipsoid zone causing further visual loss.10,18 However, LMH usually have good visual acuity due to the frequent integrity of the external limiting membrane.11-13,18

The new retinal focus for the visual axis after the LMH size increase, demanded a higher myopic correction the use of which immediately improved visual acuity in our patient.

In summary, we report a case with development of a LMH associated with the combination of myopia, aging, traction from a macular epiretinal membrane6, trauma from cataract surgery1-3 and from Nd:YAG laser posterior capsulotomy.15-17

The case has been documented with TD and SD-OCT that have showed enlargement and change in morphology of LMH and decrease of the foveal thickness.11 During the 4 year follow-up the external limiting membrane was not affected.0,11 and final BCVA was 20/30 through a conservative management, simple observation without vitrectomy.14 Therefore, we have not attempted pars plana vitrectomy in this type of cases15 but it can be indicated when the ellipsoid zone is affected.12

Four year eyelapse between Nd-yag laser capsulotomy and LMH development make difficult to accept last as a cause-affect mechanism and instead think in a combination of factors and implications.15-17

Limitations of this study include the retrospective analysis and the use of two different OCT technologies. The high-resolution spectral domain OCT used only between 2011 and 2012, allows better identification of ELM and more accurate measurements than manual calculation provided from time domain OCT that we used between 2009 and 2010.

Measurement of volume tissue loss not yet achieved in LMH becomes an important desired information, similar to what already has been done with OCT regarding volume loss in glaucomatous optic disk cupping.

Conclusions

A case of LMH that enlarged on follow-up is reported. The case is documented with OCT and had good visual acuity because the external limiting membrane was not affected. Follow-up is recommended in lamellar macular holes to determine involution or progression to decide management.

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