

Spontaneous Closure of a Macular Hole in a Vitrectomized Eye for a Rhegmatogenous Retinal Detachment: A Case Report

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Abstract

Macular hole formation after pars plana vitrectomy for rhegmatogenous retinal detachment is of rare occurrence. It is commonly held to be the result of interplay of forces between remnants of the vitreous cortex and the retina. The treatment remains exclusively surgical by vitrectomy, with or without internal limiting membrane peeling, to relieve traction forces.

This case report describes a spontaneous closure of a macular hole in a 67 years old male patient, in whom vitrectomy was performed for a rhegmatogenous retinal detachment. The patient had an initial postoperative improvement of his visual acuity.

Four weeks postoperatively, he presented a full thickness macular hole documented by an OCT-SD showing a thin epiretinal membrane, and refused any further surgical intervention. A monthly surveillance was suggested. One month later, the patient reported an improvement in his visual acuity and the OCT-SD revealed a complete closure of his macular hole without any treatment being provided.

To our knowledge, there have only been 2 similar cases described in literature suggesting the hypothesis of tangential vitreomacular tractions due to vitreous cortex remnants. Herein, we report the case of a spontaneous closure of a macular hole, OCT-SD documented, with a visible epiretinal membrane.

Keywords: Vitrectomy; Macular hole; Epiretinal membrane; OCT SD

Introduction

The development of macular holes after vitreoretinal surgery for rhegmatogenous retinal detachment (RRD) is a seldom but well-documented phenomenon. It has been attributed to vitreoretinal tangential forces along with degenerative processes of the macula.

On one hand, there are several publications about surgical repair of these macular holes, and about spontaneous closure of macular holes of different origins, such as idiopathic macular holes, traumatic macular holes or macular holes that have re-opened after a successful primary vitrectomy.

On the other hand, we only found 2 cases in the literature review we performed, reporting a spontaneous closure of a macular hole in previously vitrectomized eyes for rhegmatogenous retinal detachment.

Case Report

A 67 years old male patient, binocularly pseudophakic, was referred to our hospital for an acute decrease of visual acuity in his left eye. The examination found a best-corrected visual acuity of 1/10, the anterior chamber was normal with a normal intra ocular pressure (IOP). The funduscopy, Optical Coherence Tomography-Spectral Domain (OCT-SD) and B-scan ultrasonography showed a macula-off, total retinal detachment, with a retro-equatorial horseshoe-like retinal tear, also

referred to as a flap or U-shaped tear, on the 10 o'clock meridian. A posterior vitreous detachment with a visible Weiss ring was observed in the fundus examination as well, with no macular hole.

A posterior trans-conjunctival pars plana vitrectomy (23 gauges) was performed, completed by fluid-air exchange, retinopexy with a visually controlled cryotherapy on the dehiscence and gas tamponade by the SF6 after air-gas exchange. The patient was then instructed to maintain a prone position (face down) for a week postoperatively. The next day examination found an entirely reattached retina.

One week postoperatively, the follow-up examination found an attached retina, with a best-corrected visual acuity of 4/10.

After 3 weeks (1 month postoperatively), the patient complained about a decreased visual acuity limited to hand motion. The slit lamp examination found a normal anterior segment, normal IOP, the intraocular lens (IOL) was in place. However, the fundus examination revealed a macular hole and the retina was still attached on the whole visible surface.

An OCT-SD was performed revealing a full thickness macular hole of 275 μ m, with a perifoveolar retinal thickening, associated to retinal folds secondary to a thin epiretinal membrane (Figure1).

Given these findings, a peeling of the epiretinal membrane and the internal limiting membrane was suggested to the patient who refused any further surgical intervention. We decided to monitor the patient's progress monthly without providing any treatment.

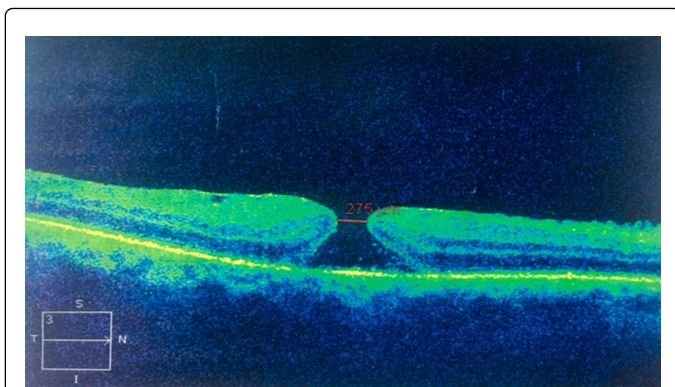


Figure 1: Associated to retinal folds secondary to a thin epiretinal membrane.

One month later, the patient was seen with an improved visual acuity, back to the initial postoperative best-corrected visual acuity of 4/10. The fundus examination revealed a spontaneous closure of the macular hole. An OCT SD was performed showing a complete full thickness closure of the macular hole, a well-defined foveolar shape, a continuous external limiting membrane and a defect at the level of photoreceptors in the form of a discontinuous layer with atrophic aspects and the presence of hyper reflective deposits (Figure 2).

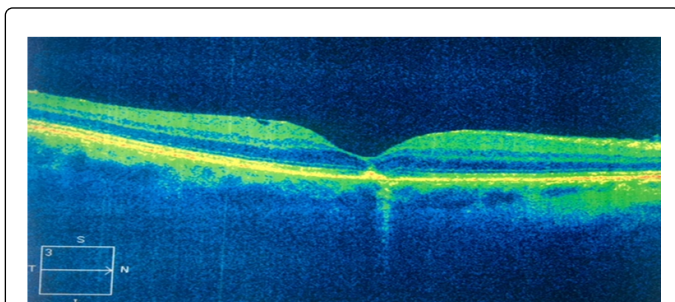


Figure 2: Level of photoreceptors in the form of a discontinuous layer with atrophic aspects and the presence of hyper reflective deposits.

Eighteen months later, the best-corrected visual acuity remained the same, the macular hole still closed. The fundus examination revealed development of atrophic and pigmentary modifications in the superior area of the macular region.

Discussion

Macular holes are a rare complication of rhegmatogenous retinal detachment surgery. The prevalence of this occurrence ranges between 0.24% to 0.5% in literature [1,2]. The mechanism of secondary macular holes (MH) after vitrectomy for RRD is not clear.

In a literature review, we found several hypothesis regarding the pathogenic mechanisms for MH formation in vitrectomized eyes [2-4], such as surgical manipulation, post-surgical inflammation, vitreofoveal tangential traction resulting in direct traction of the macula by attached vitreous cortex remnants, vitreoschisis, thinning of the foveal surface after RRD surgery, macular cystoid degenerative process

resulting in cyst formation and rupture, and the presence of epiretinal membrane.

In a study conducted by Kumagai et al. [3], 47 cases reported to develop secondary MH after RRD vitrectomy, showing that all eyes diagnosed had an epiretinal membrane (ERM) or membrane-like tissue at the time of diagnosis.

However, the spontaneous closure of macular holes of other origins has been reported [5,6], such as idiopathic and post-traumatic etiologies. The exception to this being macular holes secondary to rhegmatogenous retinal detachment surgery, as it is the case of our patient.

Currently, there are only four similar cases [7-10] reported in the literature to our knowledge.

The mechanism behind the spontaneous closure of the macular hole in each one of the 3 cases was explained by a direct remission of the primary etiologic factor incriminated in its formation in the first place.

In the first case reported by Kim et al. [7], the OCT-SD showed vitreoretinal tractions caused by the posterior vitreous cortex remnants at the time the macular hole was diagnosed, it was believed in this case that the vitreo macular tractions led to macular distortions and edema resulting in formation of the macular hole. Therefore, the macular hole closure was thought to be due to the resolution of the vitreomacular tractions afterwards. Recent studies [11] have also reported that removal of vitreomacular tractions through enzymatic vitreolysis can result in MH closure.

The remission of the primary etiologic factors may in part explain the spontaneous resolution of the macular holes. In our case, the patient's OCT showed a thin epiretinal membrane that remained visible after the closure of the macular hole. No visible vitreous remnants were observed unlike the above-cited reported case.

Thus, we tend to believe that the secondary manifestation of these holes may be seen when the vitreomacular tractions have already disappeared after the surgical vitrectomy, leading us to suggest that other factors may be incriminated.

Conclusion

Certainly, further studies are needed in order to understand the pathogenic process of such cases. Large group studies, in which patients, look for reasons of willingness or feasibility, benefit of a monitoring instead of surgical repair for macular holes that eventually, resolve spontaneously. The use of technics such as the OCT-SD and ultrasound imaging will, with no doubt, be necessary to achieve the best understanding of these process.

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