Spontaneous closure and quick reopening of a full thickness idiopathic macular hole

Cierre espontáneo y rápida reapertura de un agujero macular de espesor completo idiopático

ABSTRACT

Purpose: To report a quick reopening of a spontaneously closed full thickness macular hole.

Design: Case report.

Methods: A 68-year-old patient with stage III full thickness idiopathic macular hole in one eye was followed up for thirteen months with fundus photography and optical coherence tomography (OCT).

Results: Twelve days after the first examination, that detected the macular hole, OCT scans revealed the closure of the macular hole associated to the development of a small epiretinal membrane (ERM). One month later, the patient was admitted to the emergency unit, complaining of progressive visual loss over the past three days. OCT examination showed a full-thickness macular hole, very similar to the previously closed, and a progression of the ERM. The patient was submitted to pars plana vitrectomy with internal limiting membrane peeling and removal of ERM. Surgical repair resulted in significant functional and anatomic outcome.

Conclusion: The reopening of a spontaneously closed macular hole is remarkably uncommon and has been reported previously in two patients. A rigorous follow-up is mandatory, because these macular holes can quickly reopen, as demonstrated in this case report.

Key words: macular hole, spontaneous closure, spontaneous reopening, optical coherence tomography.

RESUMEN

Propósito: describir un caso de rápida reapertura tras cierre espontáneo de un agujero macular de espesor completo.

Diseño: caso clínico.

Métodos: Paciente de 69 años con agujero macular de espesor completo estadio III en un ojo que es seguido durante 14 meses mediante retinografías y tomografía de coherencia óptica (OCT).

Resultados: Doce días tras la exploración inicial, los cortes de la OCT revelaron el cierre del agujero macular asociado al desarrollo de una pequeña membrana epiretiniana (MER). Un mes más tarde, el paciente acudió a urgencias por disminución de agudeza visual progresiva desde hacía tres días. La exploración mediante OCT mostró un agujero macular de espesor completo, muy similar al que previamente se había cerrado, y una progresión de la MER.

El paciente fue sometido a vitrectomía pars plana (VPP) con pelado de membrana limitante interna y remoción de MER. La cirugía resultó en buenos resultados anatómicos y funcionales.

Conclusión: La reapertura tras cierre espontáneo de un agujero macular es muy infrecuente y ha sido descrita en tan solo dos casos hasta ahora. Es necesario un seguimiento estrecho, pues estos agujeros pueden reabrirse rápidamente, como mostramos en este caso.
**INTRODUCTION**

Spontaneous closure of traumatic macular hole is described as a common event in peer-reviewed literature. However, the spontaneous closure of stage III and IV idiopathic macular hole has been reported in a few cases, being considered a rare event. Moreover, there are only two reported cases about reopening of a spontaneously closed macular hole.

**CASE REPORT**

A 68-year-old Spanish man was referred with complaints of decreased vision and metamorphopsia in his left eye (OS) for approximately three months. His ocular history included previous laser photocoagulation as treatment for peripheral retinal tears in the OS and vitrectomy due to retinal detachment in the right eye (OD) two years ago. He was submitted to cataract surgery in both eyes four years ago.

At the first visit, his best corrected visual acuity (BCVA) was 20/70 in OS and 20/25 in OD. Anterior segment examination revealed pseudophakia with no further abnormalities in both eyes. Fundus photographs revealed an image of full thickness macular hole (FTMH) in OS, and a partial thickness macular defect (LMH) in OD. Optical Coherence Tomography (OCT) examination (Figure 1) showed a stage III FTMH in OS and a LMH in OD. Some cystic spaces on both edges of the full-thickness hole, and a small epiretinal membrane (ERM) were noted, as well as clear irregularity of the junction of inner and outer segments of photoreceptors (IS/OS). Twelve days later, BCVA in OS improved to 20/25. OCT scans revealed a closed macular hole. A defect in the continuity of the photoreceptor layer with a small subfoveal region of hyperreflectivity, probably due to the regeneration of the outer retinal layers (Figure 2) was observed.

One month later, the patient was admitted to the emergency unit, complaining of progressive visual loss in the OS over the past 3 days. OCT examination showed a full-thickness macular hole, very similar to the previous findings before the macular hole spontaneous closure, as well as a progression of the ERM (Figure 3a).

The left eye was submitted to pars plana vitrectomy with internal limiting membrane peeling, ERM removal and 20% SF6 intraocular gas fill with patient face down positioning. Two months after vitreoretinal surgery, the BCVA was 20/25. Anterior segment exam was unchanged from the initial exam. Dilated fundus examination and OCT of the OS revealed closure of the macular hole. OCT imaging also showed partial restoration of foveal contour, and partial recovery of integrity at the line corresponding to the photoreceptor layer.

One year after the vitreoretinal surgery, the BCVA remained unchanged as well as OCT and fundoscopy images (Figure 3b).

**DISCUSSION**

It is well known that the spontaneous closure of idiopathic macular holes is less prevalent and less well understood than closure of traumatic macular holes. Several mechanisms for spontaneous closure of idiopathic macular holes have been described: a complete detachment of the posterior hyaloid, leading to a reduction in antero-posterior tractional forces; the bridging effect of retinal tissue and glial cells proliferation across the hole; and the formation of a contractile ERM, which provokes shrinkage of the hole, resulting in cells proliferation at its base.

In this reported case, we hypothesize that, probably, a vitreomacular traction started the formation...
of the FTMH, followed by a posterior vitreous detachment and, as the antero-posterior tractional forces released, the macular hole began to close.

A compelling point is that the inner and outer diameters of macular holes were small, and this may have contributed to the quick closure of the hole. Despite of the complete closure, the BCVA did not improve to normal values. It is likely that the disruption in the photoreceptor layer had resulted in a worse BCVA.

Several factors have been described for the reopening of full thickness macular holes after vitrectomy: cataract extraction (although controversial), neodymium: YAG capsulotomy, tangential contraction of an ERM and others. However, the pathogenesis of spontaneous reopening is still controversial.

It has been reported that the astrocytes and myo-fibroblasts that lead to macular hole closure may be involved in the reopening of macular holes\textsuperscript{11}, hypothesis that may occurred in this interesting case. In the case of the tangential contraction of ERM, the formation of intraretinal cysts and their later rupture, as well as fusion, seems to be the clinical evidences to support the hypotheses for the pathogenesis of spontaneous reopening and/or closure of this macular hole.

Despite spontaneous closure/reopening of macular holes have being already reported in the literature, there are 2 distinct features of this case report: the relatively old age for the spontaneous closure; and, more relevant, the quick closure and reopening of the hole (both findings were observed in less than two months.). We postulate that, considering the absence of either surgery or inflammatory/vascular diseases during the follow-up, the tangential traction due to the progression of the epiretinal membrane associated to probable antero-posterior traction and the consequent formation of intraretinal cysts with later rupture and fusion, might have played a role in the reopening of the full thickness macular hole.

CONCLUSION

This is the third case report in peer-reviewed literature, which describes the reopening of a spontaneously closed full thickness macular hole. The relatively advanced age of the patient, as well as the quick closure and reopening of the hole, are unique features of this case report.

REFERENCES