Follow-up of a Full-thickness Macular Fold Following Vitrectomy for Rhegmatogenous Retinal Detachment

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INTRODUCTION

Retinal folds (RF) are an underestimated complication of rhegmatogenous retinal detachment (RRD) surgery.[1] They have been described following scleral buckling surgery and primary pars plana vitrectomy (PPV), however they can occur less commonly after PPV for epirretinal membrane peel.[1,2] It has been suggested that RF result from residual subretinal fluid being sequestered after the retinal break has been closed by intravitreal gas tamponade, allowing subretinal fluid to accumulate in a gravity dependent position at the margin of attached and detached retina.[1,3] Risk factors include use of intraocular gas tamponade, recent onset of RRD, superior bullous detachment, incomplete drainage of subretinal fluid and RRD running through the fovea.[1,3] Prompt diagnosis might be challenging because of difficulties in indirect ophthalmoscopy and delayed visual complaints due to high refractive error and low visual acuity associated with gas tamponade *in situ*.[1] Natural course is variable and difficult to predict, however RF may persist and determine permanent visual loss.[1]

Our aim was to report a case of spontaneous resolution of a mild full-thickness RF with foveal involvement following an uncomplicated PPV with intraocular gas tamponade for a superior on-macula RRD.

MATERIALS AND METHODS

A retrospective case report was performed. A statement of informed consent to publish this case and its images was gathered from the patient.

CASE DESCRIPTION

A 61-year old male presented at our department with floaters and reduced visual acuity in the left eye (OS) for one day. He had past medical history of hypertension, dyslipidemia, *diabetes mellitus*, obesity, coronary artery disease and atrial fibrillation. On clinical examination, the patient had a best corrected visual acuity (BCVA) of 20/20 in the right eye (OD) and 20/200 in OS. There was no relative afferent pupillary defect. Slit-lamp exam was unremarkable and intraocular pressure was normal. Fundus examination revealed an on-macula superior RRD with vitreous hemorrhage and a single temporal superior horseshoe retinal tear in OS. There were no relevant funduscopic findings in OD. The patient underwent 23-gauge-PPV, internal drainage of subretinal fluid, endolaser photocoagulation around the retinal tear, fluid-air exchange and intraocular tamponade with SF6. At the end of surgery, the retina was attached with very marginal subretinal fluid. Patient assumed face down positioning immediately, followed by right cheek-to-pillow positioning a few hours later.

On the first day after surgery, the retina was attached, vitreous hemorrhage had been successfully drained and 70% of vitreous cavity was filled with gas. The patient was advised to maintain positioning measures and was medicated with topical antibiotic and corticosterois.

One week later, the retina remained attached and 40% of vitreous cavity was filled with gas, however there was an inferior RF extending to the temporal quadrant and involving the fovea (Figure 1.1). Optical coherence tomography (OCT) confirmed a mild full-thickness macular fold with foveal involvement (Figure 1.1). After

two weeks, already without gas filling the vitreous cavity, the macular fold was unchanged. However, BCVA had improved to 20/40 and there was a reduction in retinal layer's folding in OCT findings (Figure 1.2). The patient complained of mild oblique binocular diplopia, that improved substantially with a prism (+2 prism diopters with base oriented at 245º), and denied metamorphopsias. As such, we decided to maintain a wait and watch approach. A month later, **our** patient was asymptomatic and BCVA had further improved to 20/25. Three months after surgery, the RF had completely resolved and retinography, OCT and fundus autofluorescence imaging were unremarkable on the fovea, the latter showing only an unintentional retinal displacement (Figure 1.2).

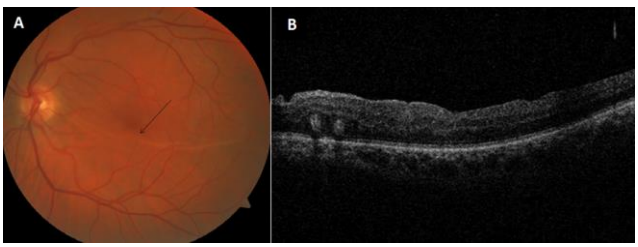

Figure 1.1 - A- Colour fundus photograph of the left eye showing an inferior retinal fold with macular involvement; B- Optic coherence tomography of the left eye showing a full-thickness macular fold

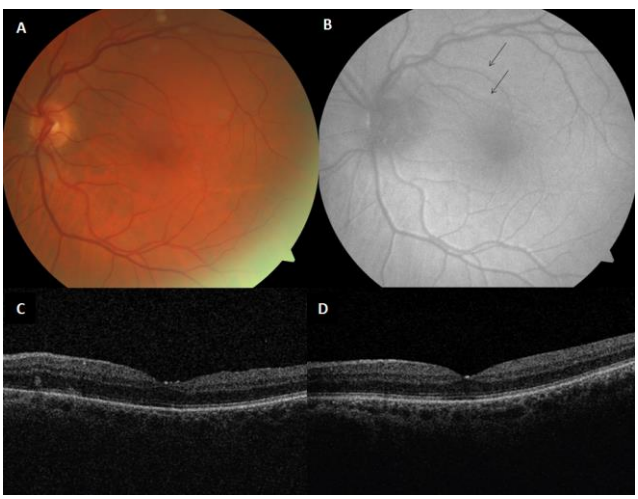

Figure 1.2 - A – Unremarkable colour fundus photograph of the left eye three months after surgery, without evidence of a residual retinal fold near the fovea; B – Unremarkable fundus autofluorescence image of the left eye three months after surgery, except for two hyperfluorescent lines parallel to temporal superior retinal vessels, as indicated by the arrows, demonstrating unintentional retinal displacement after surgery away from the fovea; C - Optic coherence tomography of the left eye three weeks after surgery, showing a residual retinal fold; D – Unremarkable optic coherence tomography near the fovea of the left eye three months after surgery.

CONCLUSIONS

RF are a rare but potentially severe complication of RRD surgery.[1] They are generally attributed to sequestration of residual subretinal fluid under the macula in a gas-filled eye. The residual subretinal fluid pools inferiorly and settles beneath the gas bubble, creating redundant retina between the bubble and the attached retina. With resorption of the subretinal fluid, the retina remains folded over itself, thus creating one or more folds.[1,2,3] In our case, the most likely causes were incomplete subretinal fluid drainage and improper positioning immediately after surgery.

Clinical manifestations of RF are variable and largely dependent on their location, extension and associated retinal distortion degree.[1] There might be complaints of visual loss, central scotoma, metamorphopsias and/or diplopia, especially in cases with macular involvement.[1,2,3,4] Although in our case there was a mild full-thickness macular fold affecting the fovea, the patient only complained of mild diplopia that resolved with prisms prescription.

The natural course is extremely variable. Complete regression of the RF with full restoration of visual function, partial flattening with minimal or moderate improvement of visual function or severe permanent structural damage are all possible consequences.[3] Therefore, optimal management is still not clear. Nevertheless, conservative management for cases with outer retinal folds and surgical intervention for full-thickness folds have been proposed.[2] In our case, we opted for a wait and watch approach since the patient was only mildly symptomatic and had a reasonable BCVA. In fact, the RF became progressively less prominent and two months after surgery BCVA was stable, there was only a residual RF on fundus examination, and fundus autofluorescence imaging and OCT were unremarkable on the fovea. Spontaneous regression and functional recovery have also been reported in a few publications on full-thickness folds, although they are more common in outer and partial-thickness RF.[4,5]

In conclusion, full-thickness macular folds are an underestimated complication following RRD surgery. Although they tend to be symptomatic and associated with a worse outcome, our case report illustrates that mild macular full-thickness folds may have a spontaneous regression and functional recovery, in accordance with a

few other publications on this topic. As such, conservative management might be indicated as an initial approach even in full-thickness RF, especially if the patient has few complaints and visual function is reasonable.

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