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Case report

Novel technique for removal of persistent subretinal fluid following nondrain retinal detachment surgery

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ABSTRACT

This manuscript describes a case of successful reattachment of a macular-off retinal detachment following optical coherence tomography-guided internal drainage of retained subretinal fluid following a nondrain method. To date, there has not been any documented treatment option for this common phenomenon. This novel technique describes a method to remove such fluid and successfully appose the retina to the retinal pigment epithelial layer.

1. Introduction

Chronic nonresolution of subretinal fluid (SRF) is common following conventional nondrain retinal detachment (RD) repair.[1] The frequency of persistent SRF has been reported to be as high as 94%.[2] To date, there have been no definitive methods to successfully remove this SRF. This case reports a novel technique to remove chronic SRF using optical coherence tomography (OCT)-guided internal drainage. Informed consent was obtained from the patient.

2. Case Report

A 21-year-old myopic female patient presented with a 10-week history of visual loss in the left eye. On examination, she had a macula-off RD due to atrophic round holes in the peripheral retina with no posterior vitreous detachment. The retinal detachment extended from the superotemporal retina with round holes at the 2 o'clock position and rhegmatogenous detachment which extended inferiorly to the infranasal quadrant. There was a tide mark suggesting chronicity with no other signs of proliferative vitreoretinopathy. Right dilated fundsocopy revealed a flat retina, but with associated flat round holes.

She underwent left cryopexy and buckle procedure under general anesthesia with contralateral laser retinopexy to the round holes. Preoperatively, her best corrected visual acuities were 20/15 right and 20/1200 left. At 2-months follow up, the left retina was flat and visual acuity was 20/600 in the left eye, but spectral domain OCT scan revealed shallow SRF affecting the fovea (Figure 1A). Conservative management was chosen and the patient was asked to return in 4 months. At 4 months, the retina remained flat, but the SRF remained and vision was 20/200 (Figure 1B). The SRF extended temporally up to the superior arcade. After discussing the risks and benefits of surgery, informed consent was obtained and the patient agreed to have pars plana vitrectomy, OCT-guided retinotomy, internal drainage of SRF, 30% sulfahexafluoride gas tamponade, and laser. Internal drainage was performed using active aspiration on a 23-gauge flute needle with the bottle height raised to 45 mmHg. Active aspiration with raised bottle height allowed for a better chance of removal of chronic and viscous SRF. A higher bottle height also acts as a preventative measure in case there is any bleeding intraoperatively during this procedure. No postoperative posture was advised for the patient. The location of the retinotomy was chosen 1.5-disc diameters away from the fovea where there was confirmed SRF on preoperative OCT scan (Figure 2). This was performed 7 months following initial nondrain surgery.

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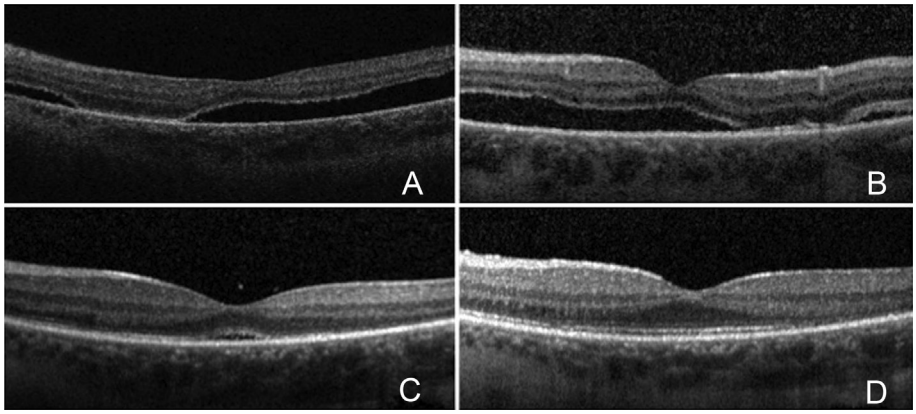

Figure 1. (A) Left eye optical coherence tomography (OCT) 2 months following retinal detachment surgery; (B) left eye OCT 4 months following retinal detachment surgery; (C) left eye OCT 2 months following vitrectomy and subretinal fluid drainage; and (D) left eye OCT 6 months following vitrectomy and subretinal fluid drainage.

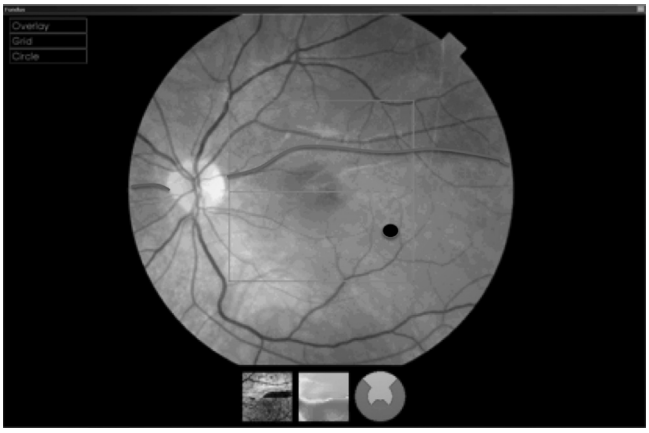

Figure 2. Left eye fundus picture: 4 months following retinal detachment surgery the line delimits the superior border of retinal detachment whilst the round circle shows the retinotomy site.

Two months following vitrectomy, OCT scan showed resolution of SRF with a small bleb remaining, but no improvement in vision (20/200; Figure 1C). Six months following vitrectomy, complete resolution of SRF was achieved (Figure 1D). Visual acuity remained at 20/200 at 12-months follow-up.

3. Discussion

Although chronic SRF does sometimes absorb spontaneously over many months,[3] there is evidence that apoptosis of photoreceptors occur in chronic RD and play a role in functional outcome.[4] In chronic RD, SRF can often be viscous and perhaps this hinders retinal pigment epithelial cells to absorb the SRF in chronic RDs. Veckeneer et al[5] found rhodopsin-immunopositive and -negative cells within their viscous SRF samples. Despite drainage of SRF, procedures such as conventional Drainage Air Cryopexy Explant surgery have been reported with nonresolving SRF.[1] There has, thus far, been no definitive treatment to aid SRF reabsorption.[6] In an attempt to reappose the photoreceptors with the retinal pigment epithelium, this case illustrates a novel method in which chronic SRF could be surgically removed by internal drainage. Without the understanding of where the SRF is intraoperatively due to the shallow nature of the fluid, OCT-guided drainage is helpful in locating the optimal site of drainage. Our paper describes drainage using preoperative OCT scans, but with the advent of intraoperative scanning, this new tool may assist easier localization and visualization of the SRF. As seen on serial OCT scans, it is successful in the rapid removal of SRF. One must, however, be aware that all surgery has risks and the benefits need to outweigh risks in order to proceed with this procedure. In our case, visual recovery was potentially limited by the chronicity of the RD and also the chronicity of the residual SRF following primary RD repair. Further studies into the effects of early management of residual SRF can allow us to understand the potential advantages of early drainage of SRF.

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