Case report

Autologous neurosensory retinal flap for closure of refractory macular hole in a patient with macular telangiectasia

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ABSTRACT

Purpose: This study explores autologous neurosensory autograph for a patient with a chronic full-thickness macular hole (FTMH) and idiopathic macular telangiectasia type 2 (IMT2).

Observations: The patient had a chronic 1355 μm FTMH and best corrected visual acuity (BCVA) of 2 logMAR units after two unsuccessful attempts to close the macular hole. Following a 25-gauge vitrectomy, a 2-disc diameter neurosensory autograft from the supertemporal retina was mobilized and secured with perfluoro-N-octane (PFO) tamponade. After being postured supine for one week, the PFO was exchanged for silicone oil. Two months later, silicone oil was exchanged for 20% sulphur hexafluoride (SF6).

Conclusions and importance: The graft achieved anatomical and functional success with BCVA of 0.6 logMAR units. This case supports autologous neurosensory autograph as a technique for achieving closure of chronic macular holes refractory to conventional treatment.

1. Introduction

This case study explores autologous neurosensory autograph for a patient with a chronic full-thickness macular hole (FTMH) and idiopathic macular telangiectasia type 2 (IMT2). Chronic relapsed FTMHs associated with trauma and large diameter FTMHs have a poor closure rate with conventional techniques.1 Reduced surgical success is seen in FTMH in IMT2 due to the underlying neurosensory degeneration2 and FTMH frequently reoccurs post-surgery.3 Until recently, surgical treatment for FTMH in IMT2 only addressed the forces exerted on the retina by the vitreous and ILM, without addressing the inherent mechanical abnormalities within the retina. The autologous neurosensory retinal flap surgery was first described by Grewal and Mahmoud and involves harvesting an autologous neurosensory retinal free flap and positioning it over the FTMH.4

2. Case report

A 73-year-old male presented with a chronic FTMH following two unsuccessful vitrectomies for FTMH. He has a background of IMT2 and, as a teenager, sustained a blunt trauma to his eye. His first vitrectomy with ILM peel and gas had an uncomplicated post-operative course however, the FTMH persisted. Six months after the initial surgery, the FTMH remained open; repeat vitrectomy combined with phacoemulsification and insertion of MA60AC (Alcon, Fort Worth Texas) lens was performed. However, the FTMH did not close and his BCVA remained poor at 2 logMAR units.

His FTMH enlarged from 635 μm (Fig. 1) to 1355 μm (Fig. 2) and his BCVA remained poor at 2 logMAR units. He was not a candidate for either ILM or anterior lens capsular autograft because of his previous surgeries.

Surgery was undertaken under a general anaesthetic with a 25-gauge vitrectomy. A posterior capsulectomy was performed using the vitreous cutter to improve the surgical view. Endodiathermy was applied around a 2-disc diameter neurosensory donor site in the supertemporal retina. The graft was cut using standard 25-gauge Grieshaber™ scissors, while the edge of the graft was held with Grieshaber™ end-grasping forceps in order to free the graft from the underlying retinal pigment epithelium (Fig. 3. A.B). Endoillumination was achieved using an Alcon Chandelier and a Light Pipe. The free graft was manipulated into the correct position within the FTMH using end grasping forceps, perfluoro-N-octane (PFO) was instilled over the flap to secure it in position. A PFO/silicone oil exchange was attempted; however, the graft dislodged, and was secured with a full PFO fill.

Postoperatively, the patient was postured supine for one week, following which the heavy liquid was removed and exchanged with silicone oil (1000 cSt) without disruption of the graft or retina. Two months after the initial procedure, the silicone oil was exchanged for...
Fig. 1. OCT of FTMH prior to his initial vitrectomy.

Fig. 2. OCT of patient’s FTMH, 3 years post unsuccessful repair.

Fig. 3. Images of procedure: A. Endodiathermy to neurosensory donor site; B. Graft removed using grasping forceps; C. Free graft manipulated into correct position; D. PFO instilled over flap to secure it.
20% sulphur hexafluoride (SF₆) The graft remained attached in situ and the peripheral retina secured.

Over this period, multiple optical coherence tomography examinations demonstrated that the FTMH remained anatomically filled with stable, flat edges (Fig. 4). The patient’s BCVA was 0.78 logMAR units at one-month post-instillation of 20% SF₆, with a 1.4 logMAR unit improvement in visual acuity at three months, with BCVA of 0.6 logMAR units. A visual field study demonstrated three quadrants of the macular function (Fig. 5).

Full-thickness macular holes in IMT2 are considered to have a poor prognosis for successful anatomical closure. The retinal autograft technique achieved both anatomical closure and functional improvement for a patient with IMT2 and FTMH. The patient’s BCVA improved from 2 logMAR units to 0.6 logMAR units and the visual field showed a functional improvement. However, the functional outcome does not correlate with the OCT. We postulate that the restoration of the inner retinal layers made better connections with the remnant outer retina at the edge of the hole and thus possibly allowed better eccentric fixation. The retinal free flap employed was 2-disc diameter for the 1355 μm MH as the larger flap area aided in positioning and obtaining closure of the MH. A longer-term follow-up is required however, this case provides support that autologous neurosensory autograft is a promising technique for closure of chronic macular holes that have not achieved anatomical closure by conventional surgery.

Patient consent

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Authorship

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Declaration of competing interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ajoc.2020.100644.

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