

Spare some internal limiting membrane for later: free ILM patch and neurosensory retina graft

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Abstract

Purpose Editorial to De Giacinto et al case report on free autologous neurosensory retina patch.

Methods Literature review and experts' opinion

Results In the present issue, De Giacinto et al describe a free autologous neurosensory retina patch to close a chronic macular hole. This new technique was made necessary by an extended internal limiting membrane peeling during the first surgery, that prevented grafting a patch of internal limiting membrane when the hole did not close. We hereby review pros and cons of patching a chronic macular hole with an internal limiting membrane patch, as well as the importance of not over-enlarging a peeling.

Discussion Internal limiting membrane patch can be considered in chronic macular holes. It may not be an option in cases of over-enlargement of a previous peel; free autologous neurosensory retina patch may be a valid alternative in such cases.

Keywords ILM peeling · ILM patch · Chronic macular hole · Neuroretina graft

Main text

Since the application of vitrectomy combined with gas tamponade to seal a macular hole (MH) was performed by Kelly and Wendel, vitreous surgery has become the standard treatment for macular holes (MHs) [1]. Hole closure is not sufficient for the recovery of vision but is necessary to ensure good visual acuity and prevent further vision loss. It is challenging to achieve hole closure in case of chronic large macular holes. In 2010, Michalewska and associates [2] reported the inverted ILM flap technique, reporting a higher macular hole closure rate and suggesting that the inverted ILM flap might stimulate the proliferation of glial cells, which fill macular holes. However, this procedure requires the ILM to be attached at the margin of the macular hole to secure the flap in position until the gas tamponade is applied. Accordingly, it is not an option in eyes from which the ILM around the macular hole has already been removed in the previous surgery or if the inverted flap detaches from the edge of the MH during surgery. In the past 2 years, more and more publications are describing the use of an autologous ILM patch for chronic MHs [3].

Those of us who have tried a free ILM patch graft will appreciate the challenges that face surgeons performing this type of surgery. For us, the main problem lies in placing the ILM patch on top of the macular hole. Without any attachment, as is the case

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with an inverted ILM flap, the ILM patch is unlikely to stay put where it is “placed.” Dai et al. [4] described the use of the edge of the hole to secure the graft. Previously, Wolfensberger [5] has advocated the use of hyaluronate-based viscoelastics to act as an

adhesive. Lai et al. [6] have used autologous blood as a glue. Park et al. [3] have described the use of a small bubble of perfluorocarbon liquid placed adjacent to the ILM flap and then immediate rotation of the eyeball to roll the bubble up to the ILM flap once this is

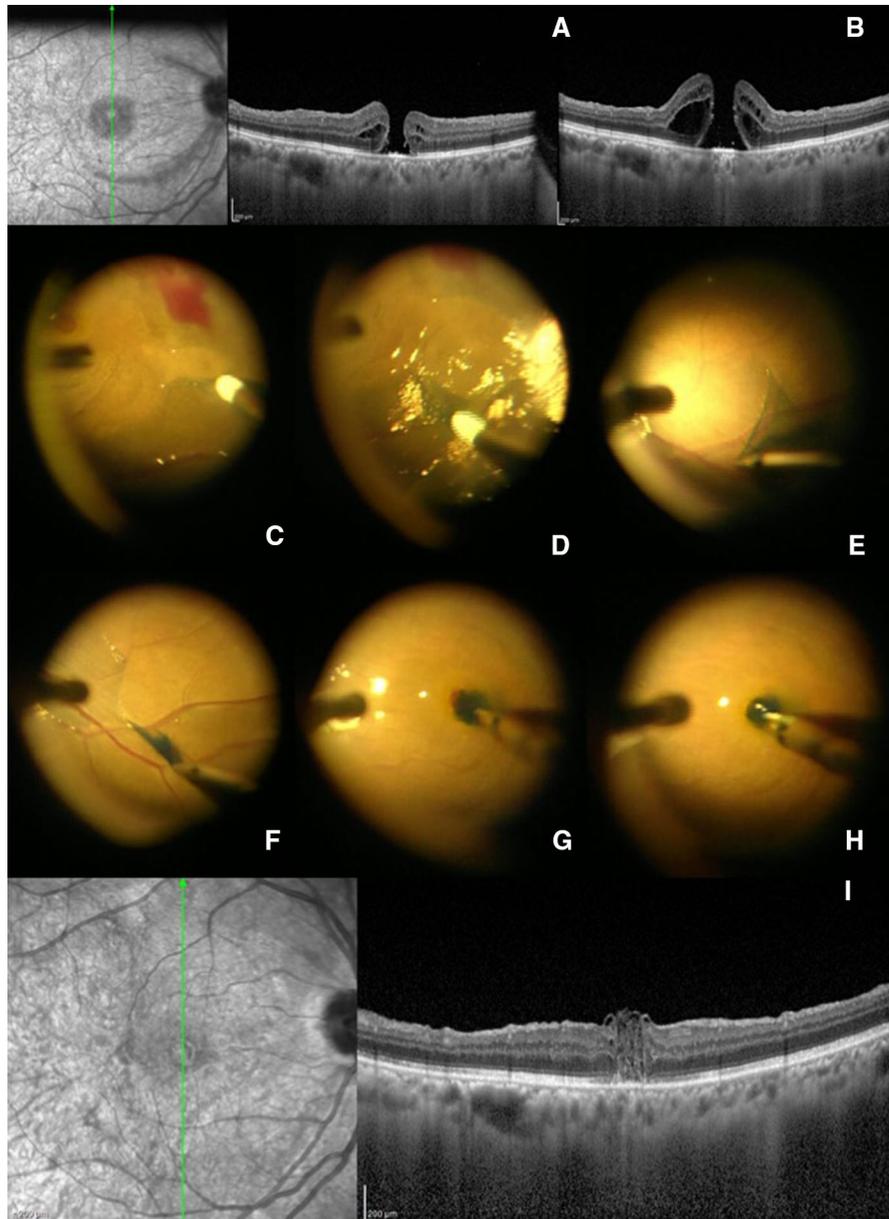


Fig. 1 A 61-year-old female underwent pars plana vitrectomy for a macular hole, with peeling of the ILM, as evident by the swelling of the arcuate nerve fiber layers in (a). Patient failed to position and after 4 month the macular hole persisted (b). A second surgery was performed, during which the remaining ILM was stained, and under perfluorocarbon an edge was created

with Tano scraper (c, d) just temporal to the parafovea. The edge was grasped through serrated forceps (e) and an autologous ILM flap created (f). The patch of IL was inserted inside the hole (g, h). At 1-month follow-up, OCT showed closure of the hole and gliosis of the ILM patch (i)

positioned. In case of unclosed MHs (Fig. 1a, b), we personally perform the eccentric ILM peel under perfluorocarbon (Fig. 1c–f).

A further challenge consists on the good grip of intraocular forceps, designed to be very effective at grasping ILM but not as good at releasing it. As surgeons, we all have used the light pipe to disengage the ILM from the forceps as a natural act after an ILM peeling, but this may ruin the patch when the scope of the peeling is an autologous graft.

To solve this dilemma, in the present issue De Giacinto et al. performed vitrectomy with free flap transplantation of a neurosensory retina patch. Although being a quite invasive technique, the neurosensory patch seems to be easier to manipulate as it is less thin compared to an ILM alone, with good anatomical and functional outcomes. Impressive as the results by De Giacinto et al. might be, the impact of this case report goes beyond the introduction of a new technique, exposing our lack of understanding of the biological response to our surgical procedures.

Many surgeons feel that when it comes to ILM peeling, the larger the better. As De Giacinto et al. state, “there was no staining in the posterior pole confirming an adequate previous ILM peeling making difficult harvesting an ILM flap from outside the vascular arcades.” Therefore, if it comes to re-operation, the remaining ILM may only be available near or even beyond the arcade where it is usually thin and difficult to peel. So the question arises, how much ILM should we optimally remove?

Furthermore, why does an ILM flap or patch help the closure of a MH? The ILM flap that we tuck inside the MH contains Müller cells footplates that may serve as a basement membrane to regulate cell growth and migration and a scaffold for cells proliferation [7]. But what happens to the ILM flap or patch once the MH has closed? We often see on optical coherence tomography that the healed hole has filled with neurosensory retina, rather than just basement membrane (Fig. 1i) [8, 9].

As surgeons, once we master an elegant technique such as ILM peeling we tend to give it for granted and apply it to all cases (epiretinal membranes, small macular holes, retinal detachments with and without proliferative vitreoretinopathy) [10]. But ILM peeling should be performed with a grain of salt, and not with over-enthusiasm [11]. If a macular hole fails to close the following primary

surgery, we might be pleased if the initial peel was not too extensive, and there is some accessible ILM to harvest for patch graft surgery.

And if not, we may revert to De Giacinto et al. technique of a neurosensory patch: it is very well known that vitreoretinal surgeons like rising to challenges. Many of our readers might want to give this a try.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest to disclose.

Human rights This article does not contain any studies with human participants performed by any of the authors.

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