Letter to the Editor: A Modified Perfluoro-n-Octane-Assisted Autologous Internal Limiting Membrane Transplant for Failed Macular Hole Reintervention

Dear Editor,

We have read with interest the article written by Ozdek et al. that was published in the May 2017 issue of your journal.1 The authors address a technique using an internal limiting membrane (ILM) autograft to achieve macular hole (MH) closure.

In a previous report, we have described a similar technique for harvesting ILM free grafts by using a Tano scratcher to peel off the necessary tissue and a silicon-tipped cannula for its manipulation toward the MH under a bubble of perfluorocarbon fluids.2 Once inside the MH, an air-fluid exchange is performed, tilting the eye simultaneously to force the remaining fluid to displace outside the macula. This last maneuver prevents the air and fluid currents generated during this step of the surgery from displacing the ILM autograft. The next critical step is the “drying” of the macula as much as possible by diligent aspiration of the remaining fluid.

This variant of the technique eases the harvesting and manipulation of the ILM autograft significantly. Due to the positive results we have had with this technique, we believe there is no need for tucking the graft under the edge of the neurosensory retina rim or for using viscoelastic as an adhesive material. Furthermore, we have observed additional issues. As long as the patient maintains a semifowler or prone position, the same forces that keep the retina in place in cases of retinal detachment, as well as the capillary forces from the minimum fluid left over the macula, will firmly secure the ILM autograft long enough to induce closure of the MH. The magnitude of those forces should be sufficient to keep even a small graft of ILM in place. The size of the graft seems not to be related to the closure rate, and a complete coverage of the retinal defect seems not to be needed. The exact mechanism that promotes closure by ILM autograft remains largely unknown. However, Michalewska et al. have hypothesized that the tissue used for flaps may function as a source of Müller cells, as well as a scaffold for Müller cells proliferation and migration.3 Morizane et al. have also theorized that molecular cues from Müller cells remains may also induce closure and photoreceptor restoration.4,5 This process probably takes place in a few days while the graft is being held by the gas bubble and before the gas disappears from the vitreous cavity.

Sergio E. Hernandez-Da Mota, MD, MPH
Raul Velez-Montoya, MD

REFERENCES


Sergio E. Hernandez-Da Mota, MD, MPH, can be reached at Blvd. Garcia de Leon 598. Colonia Nueva Chapultepec. CP 58280. Morelia, Michoacan, Mexico, email: tolodamota@yahoo.com.mx.

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Reply to Letter to the Editor: A Modified Perfluoro-n-Octane-Assisted Autologous Internal Limiting Membrane Transplant for Failed Macular Hole Reintervention

We thank Hernandez-Da Mota et al. for their interest in our article titled “A Modified Perfluoro-n-octane Assisted Autologous Internal Limiting Membrane Transplant for Failed Macular Hole Reintervention – A Case Series.” We recommend our free flap technique in cases where previous macular hole (MH) surgery has been unsuccessful.1 In treatment-naïve eyes with large MH, we prefer to
do an inverted internal limiting membrane (ILM) flap technique as described by Michalewska et al.\textsuperscript{2} It is simpler doing an inverted flap than a free flap, owing to lesser chance of intraoperative flap dislodgement. In 2015, Park et al.\textsuperscript{3} described the use of perfluoro-n-octane (PFO) in ILM transplantation. However, the technique is tedious and requires eye ball movements with a potential risk of retinal injury. We recommend a large PFO bubble injected right at the start of the procedure and meticulous fluid-air exchange outside the bubble until the fluid is completely drained, thereby avoiding flap dislodgement and also the need for eye ball movements.\textsuperscript{1} Hernandez-Da Mota et al.\textsuperscript{4} have not mentioned about flap dislodgement in their case series, especially in the failed case (20%; one out of five). We believe that flap dislodgement is the most crucial factor that determines surgical success in ILM flap surgeries. We feel that the success rate will be better especially in very large MH with tucking more ILM folds into the MH than a single layer as it might induce more gliosis. However, at this point in time, we do not have any literature evidence on that. Our study was also not designed to investigate this. However, it is an interesting point that Hernandez-Da Mota et al. have brought out. We would be interested to study that in the near future.

Sengul Ozdek, MD
Prabu Baskaran, MS, DNB
Levent Karabas, MD
Pedro Pereira Neves, MD

REFERENCES


Prabu Baskaran, MS, DNB, can be reached at Aravind Eye Hospital, Cuddalore Main Road, Pondicherry 605007, India; email: prabubaskaran@gmail.com.

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