

Anatomic and Functional Outcome After Surgery for Myopic Macular Hole: Internal Limiting Membrane (ILM) Flap Technique Versus Complete ILM Removal

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OBJECTIVE the ILM flap technique in the treatment of myopic macular holes permits to achieve better anatomical and functional results compared with the complete removal of the ILM around the hole.

PURPOSE to compare the anatomic and functional outcome in patients who underwent surgery for myopic macular hole (MMH) either with the ILM flap technique or the complete removal of the ILM.

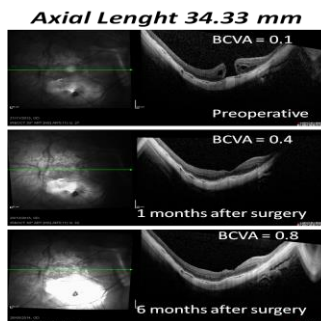
METHODS patients who underwent surgery between 2008 and 2015 for macular hole in our institution were reviewed retrospectively. Eyes with an axial length > 26 mm and no previous vitreoretinal surgery were considered. Exclusion criteria were represented by central visual loss from other causes than the macular hole. All the eyes underwent vitrectomy, shaving of the vitreous base and SF6 gas tamponade. In group 1 (36 eyes) the ILM around the MMH was completely removed while in group 2 (34 eyes) part of the ILM was left attached at the edge of the hole and folded over it before the air-fluid exchange. The anatomical outcome was based on the SD-OCT appearance.

RESULTS Preoperative BCVA was 0.60 LogMAR in group 1 and 0.70 LogMAR in group 2. Mean axial length was 30.36 and 29.58 in group 1 and 2, respectively. Minimal MMH diameter was 361 microns in group 1 and 450 microns in group 2 (p-value 0.01). At the

end of follow-up, SD-OCT scans revealed a flat-closed appearance of the MMH in 22 cases of group 1 (61%) and in 32 cases of group 2 (94%). A flat-open appearance was observed in 13 (36%) eyes of group 1 and 2 (6%) eyes of group 2, while an elevated-open was seen in 1 (3%) eyes of group 1 and no cases of group 2. Final mean BCVA was 0.58 LogMAR in group 1 and 0.39 LogMAR in group 2 (p-value 0.0207). Regardless of the surgical technique, a significant association was found between the MMH diameter and the likelihood of surgical failure ($p < 0.023$), even if the inverted ILM flap technique was associated with a 22 times higher probability of success ($p < 0.002$). The other variables didn't affect the surgical outcomes.

CONCLUSION these data show that inverted ILM flap technique represents an effective approach for the treatment of these challenging cases and permits to achieve better anatomical and functional results than the complete removal of ILM around the MMH

TAKE HOME MESSAGE inverted ILM flap technique represents an effective approach for the treatment of myopic macular holes and permits to achieve better anatomical and functional results than the complete removal of ILM



HUMAN RESEARCH This study involves human research.

IRB Approval Status: Approved by institutional review board

Mechanism of “Flap Closure” After the Inverted Internal Limiting Membrane Flap Technique



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OBJECTIVE Macular holes closed only with a thin layer of the inverted ILM flap (flap closure) shortly after surgery, develop to U- type closures with improved visual acuity in the long term.

PURPOSE 4 macular hole closure types are known: U-type, V- type, irregular and flat open. After the inverted ILM flap technique some macular holes are covered only with a thin layer of the inverted ILM flap shortly after surgery (flap closure). The aim of this paper is to describe functional and anatomical results in eyes closed with “flap closure”. Additionally to describe changes during the follow-up.

METHODS Retrospective study. Data of 190 eyes of 165 consecutive patients after vitrectomy with the inverted ILM flap technique were reviewed in order to spot eyes, in which the hole was open and covered only with a thin layer of the inverted ILM flap one week postoperatively. The surgical technique consists inverting the internal limiting membrane upside down over the macular hole. Fluid air exchange follows. Spectral Domain or Swept Source OCT were performed preoperatively and at 1 week, 1, 3, 6, and 12 months after surgery. The preoperative status (hole size) was compared with the rest of the cohort. The changes in macula anatomy and visual acuity during 12 months follow up were analyzed.

RESULTS Flap closure was noted in 50/190 eyes (26,3%) one week after surgery.

Preoperatively, the minimum hole diameter was 544,04 μm and maximum diameter at the base was 1001,42 μm , in those eyes. The minimum diameter was statistically significant bigger when compared with the rest of eyes operated with the inverted ILM flap technique (486 μm , $p < 0.05$). Visual acuity improved from 0,91 logMAR to 0,54 logMAR 12 months after surgery. Final closure type of most eyes primarily closed with the inverted ILM flap technique was U- type closure. Photoreceptor defects improved during the observation period (50 eyes- 1 week, 41 eyes- 1 month, 34 eyes- three months, 23 eyes- six months, 19 eyes- 12 months). Restoration of the external limiting membrane preceded restoration of the photoreceptors. Retinal nerve fiber layer defects were noted in 16 eyes 1 month postoperatively. No new retinal nerve fiber layer defects were noted during the rest of follow- up.

CONCLUSION Macular holes closed only with a thin layer of the inverted ILM flap preoperatively, improve their architecture up to 12 months after surgery. Visual acuity improvement was noted in those cases. "Flap closure" is a new closure type, which probably enables closure of large macular holes, which would remain open without the use of the inverted ILM flap technique.

TAKE HOME MESSAGE "Flap closure" enables to achieve good functional and anatomical outcome in eyes, which would probably remain open or flat- open if the "inverted ILM flap technique" would not be used.



Autologous and Allogeneic Lens Capsular Flap Transplantation in the Management of Refractory Macular Hole



- Peiquan Zhao, MD

OBJECTIVE To report the clinical results of autologous and allogeneic lens capsular flap transplantation in refractory macular hole (MH).

PURPOSE To report the clinical results of autologous and allogeneic lens capsular flap transplantation in refractory macular hole (MH).

METHODS This retrospective, interventional, consecutive case series included 9 eyes with persistent large or giant MH after multiple pars plana vitrectomy (PPV). All eyes underwent vitrectomy, anterior or posterior lens capsule transplantation into the MH, gas tamponade, and a 2-week postoperative head down position. Structural and functional changes were evaluated.

RESULTS The predisposing conditions to surgical failure included MH after myopic foveoschisis surgery in one eye, high myopia with a large MH in three eyes, proliferative diabetic retinopathy with MH in one eye, secondary MH after multiple PPV surgeries in two eyes and unclosed idiopathic MH (IMH) in two eyes. In the 8 eyes with anterior capsular flap transplantation, MH closed in 7, mostly closed in 1. Among them, three eyes received allogeneic lens capsular flap transplantation and no rejection was observed, and 5 eyes received autologous lens capsular flap transplantation (4 eyes

from the same eye and 1 eye from the fellow eye). MH also closed in the remaining one eye receiving posterior capsular flap transplantation. Visual acuity improved in all eyes postoperatively.

CONCLUSION Autologous and allogeneic Lens capsular flap transplantation may close the MH and improve visual outcomes in the majority cases of refractory MH. No rejection occurred in the allogeneic group.

TAKE HOME MESSAGE Autologous and allogeneic Lens capsular flap transplantation could lead to MH closure and VA improvement in refractory MH.

HUMAN RESEARCH This study involves human research.

IRB Approval Status: Approved by institutional review board

Autologous Retinal Transplant With and Without Choroidal Transplant in Chronic Refractory Macular Holes



- Tamer H. Mahmoud, MD, PhD

OBJECTIVE To determine the potential of autologous retinal and choroidal transplants in macular holes

PURPOSE To describe the anatomical and functional potential of autologous retinal transplants with or without choroidal transplant in chronic refractory macular holes

METHODS Patients with chronic refractory macular holes who underwent autologous retinal transplants with or without choroidal transplant were identified retrospectively. Baseline visual acuity (VA), refraction, prior retinal procedures, operative reports were reviewed. Postoperative VA, subsequent procedures, complications, follow up anatomical and functional imaging were assessed.

RESULTS Three patients were identified, who presented with chronic refractory macular holes, 2 were highly myopic eyes, 1 of those with chronic RD, PVR, hypotony, and 360 choroidals and the third patient had underlying GA secondary to AMD. All eyes had prior vitrectomy with ILM peel, and 2 eyes had at least 3 prior procedures to repair RD. Baseline VA was hand motion in 2 eyes and 20/200 in 1 eye. Autologous retinal transplant was chosen from superior retina in all eyes. All transplants were stabilized in position under PFC followed by direct silicone oil exchange. Postoperative VA improved

to 20/80 in 1 eye with complete closure of macular hole and recovery of foveal contour; VA improved to 20/160 in 1 eye with lamellar hole configuration, and stayed around count fingers in the eye with ChRT. Two eyes had silicone oil removed at 3 months with a stable transplant. Limited subretinal hemorrhage was seen intraoperative and postoperative in the case of ChRT.

CONCLUSION Patients with chronic refractory macular holes may benefit from autologous retinal transplants, not only to close the hole, but with potential functional improvement. Transplant was stable in position even after silicone oil removal. This limited experience with initial retinal transplant with or without choroidal transplant may help pave the way for newer treatment modalities of those types of macular holes.

TAKE HOME MESSAGE Autologous retinal transplant with or without choroidal transplant can be a potential option for patients with chronic macular holes.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Exempt from approval