

EVALUATION OF INVERTED INTERNAL LIMITING MEMBRANE FLAP TECHNIQUE IN MACULAR HOLE SURGERY

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INTRODUCTION

Macular hole is a foveal full thickness rounded defect.⁽¹⁾ affecting the central vision.⁽²⁾ Patients usually complains of metamorphopsia and decreased vision. ILM can alter cellular proliferation such as the proliferation of epi macular glial and Müller cell within the hole and throughout the ILM surface leading to macular hole enlargement, thickening, and distortion, therefore the presentation of surgical ILM peel caused a significant enhancement in the outcomes of macular hole surgeries, accordingly, it became a routine practice in MH surgeries, yet, in the beginning there was no efficient treatment with the standard procedure for MHs with large diameters >400 μm, MHs from a long duration, and MHs secondary to uveitis, severe myopia, proliferative vitreoretinopathy, and ocular trauma, failure of hole closure, till, in 2010, when Michalowski pronounced the inverted ILM flap method for large idiopathic MHs, this technique was based on not removing the ILM but instead positioning it into the MH, thus, facilitating the MH closure due to the induction of Müller cell gliosis, later, various studies show the significantly improved anatomical and visual outcomes in patients with macular holes who underwent this surgery.⁽³⁾

AIM OF THE WORK

The aim of this work was to assess anatomical and functional outcome after inverted internal limiting membrane flap technique surgery for treatment of idiopathic macular hole.

SUBJECTS AND METHODS

Subjects: The study included optical coherence tomography (OCT) scan review for 20 eyes of 20 consecutive patients who underwent inverted internal limiting membrane flap surgery technique for macular hole (MH) repair. Patient excluded was those with Traumatic MH, Myopic MH, MH detachment, Diabetic retinopathy associated MH and Other macular diseases associated MH.

Methods: This was a retrospective case series including 20 eyes of 20 patients with idiopathic macular hole with base diameter greater than 400 μm who underwent inverted internal limiting membrane flap technique along with standard 23G pars plans vitrectomy with posterior hyaloid detachment and fluid gas exchange with 20-25% sulfur hexafluoride (SF6). Diagnosis and follow up was achieved by clinical examination and the use of Optical coherence tomography with a Heidelberg®, Germany, spectral-domain, HD OCT (SPECTRALIS) before surgery and 1 month postoperatively. Medical records were reviewed for demographic information including age, sex, preoperative BCVA,

minimum linear dimension, basal hole diameter, hole height, postoperative BCVA, IS/OS junction interruption, used tamponade, type of macular hole closure. All patients underwent a complete ophthalmologic examination and assessment of preoperative Best-corrected visual acuity using a Snellen chart, BCVA was recorded in terms of Snellen fractions and converted into logarithm of the minimal angle of resolution (log MAR) values, anterior segment examination using the slit lamp was done, IOP in both eyes were measured, also, patients underwent a dilated fundus examination using tropicamide 1% for visualization of the retinal periphery and exclusion of any peripheral breaks.

Optical coherence tomography with a Heidelberg®, Germany, spectral-domain, HD OCT (SPECTRALIS) was performed in the 20 patients before surgery and 1 month postoperatively, radial and line raster scans were taken with 12 radial cuts and 25- and 19-line raster cuts, measurements were done using build in digital ruler for macular hole assessment.

RESULTS

Table 1: Relation between post-operative BCVA with IS/OS junction interruption and type of closure (n = 20)

	N	Post-operative BCVA			Test of Sig.	p
		Min. – Max.	Mean ± SD.	Median		
IS/OS junction interruption						
Interrupted	12	0.52 – 1.0	0.73 ± 0.18	0.70	U= 8.00*	0.001*
Intact	8	0.15 – 0.60	0.40 ± 0.15	0.40		
Type of closure						
U shape	13	0.15 – 0.90	0.49 ± 0.19	0.52	H= 8.479*	0.014*
V shape	5	0.52 – 1.0	0.75 ± 0.18	0.70		
W shape	2	0.82 – 1.0	0.91 ± 0.13	0.91		

Table 2: Relation between pre-operative Basal hole diameter on OCT with IS/OS junction interruption (n = 20)

	IS/OS junction interruption		t	p
	Interrupted (n = 12)	Intact (n = 8)		
Pre-operative basal hole diameter				
Min. – Max.	458.0 – 1250.0	498.0 – 879.0	0.714	0.484
Mean ± SD.	785.3 ± 203.8	725.9 ± 142.4		
Median	797.5	761.0		

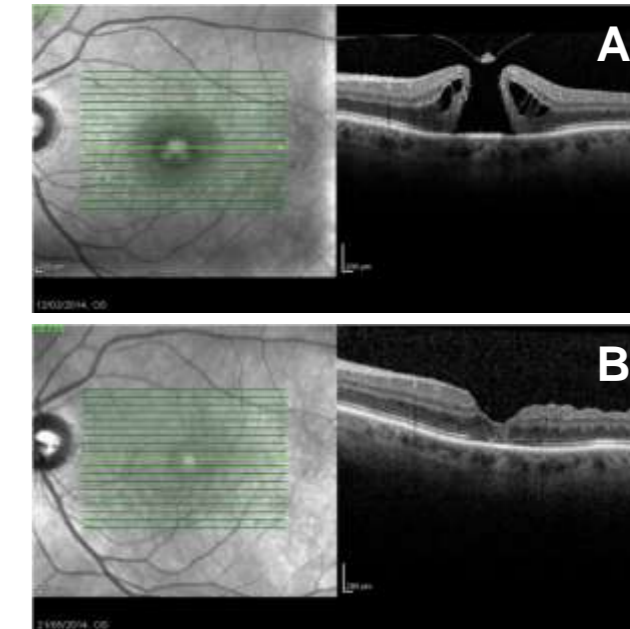


Figure 1: OCT linear scans of Left eye of Case (3)

A: Preoperative
B: Postoperative (U shaped closure)

CONCLUSION

The inverted ILM flap technique have a significant role in management of idiopathic macular holes >400 μm, also, in improving the anatomical closure and visual outcomes. The OCT facilitated the macular hole diagnosing, also, have a major role in hole diameter measuring and in identification of the postoperative anatomical type of closure and IS/OS junction assessment.

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