ILM peeling after removal of epiretinal tractions

Internal limiting membrane peeling:

cons

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To peel or not to peel?

In recent years, there has been a trend to stain and peel the internal limiting membrane (ILM) as an additional surgical step during vitrectomy and ERM peeling.
Role of the ILM

10-μm-thick transparent structure formed by the basement membrane of the Müller cells (real ILM) and their cell endfeet

Functions:

- **protective** mechanism against tear formation
- biochemical **strength** of the retina (ILM removal reduces the mean strength of the retina by 53.6 %)
- **interface** of the forces between the retina and vitreous body (pathogenesis of various retinal disorders)
Surgery

Different reasons
ILM is already peeled

“Simultaneous ILM peel is a frequent occurrence during ERM surgery, especially when there is broad or complete ERM-macula adhesion on OCT”

Several studies have suggested the two procedures (ERM peeling with or without ILM peeling) to be equivalent in terms of visual function.
Does not improve the outcomes

The role of internal limiting membrane peeling in epiretinal membrane surgery: a randomised controlled trial

- ILM peeling in idiopathic ERM surgery does not result in better visual improvement
- No statistically significant differences were observed in terms of BCVA, metamorphopsia (Amsler grid) and CRT

No effect on the recurrence

- Modern dyes
- Modern microscopes
- iOCT

No ERM recurrence was observed at the end of the 12-month follow-up in either group.

The role of internal limiting membrane peeling in epiretinal membrane surgery: a randomised controlled trial

Tranos et al.  
Possible side effects

EARLY CHANGES

- Swelling of the arcuate nerve fiber layer (SANFL)

LATE CHANGES

- Dissociated optic nerve fiber layer” (DONFL)
- Inner retina dimples
- Concentric macular dark spots
- Retinal nerve fiber layer thickness
- Microscotomas
Swelling of the arcuate nerve fiber layer (SANFL)

- 31% of eyes demonstrated one to seven hypoautofluorescent arcuate striae in the macular region on IR and BAF imaging
- Corresponding hyperreflectant swelling on SD-OCT
- 8–10 days after surgery
- Disappeared after a mean period of 2.15 months

SANFL: hypothesis

- Intraoperative surgical grasping seems to be a leading factor for the onset of SANFL.
- Damage to the Müller cell endplates (attached to the peeled ILM).

Dissociated optic nerve fiber layer (DONFL)

- “moth-eaten” appearance of the macula (blue light)
- numerous slightly dark arcuate striae within the posterior pole
- similar to the appearance of nerve fiber separations sometimes seen in high myopes splitting of nerve fiber bundles, therefore called “dissociated optic nerve fiber layer” (DONFL)
Dissociated optic nerve fiber layer”’’ (DONFL)

Correspond to inner retina dimples (SD-OCT): small depressions in the contour of the retina, apparently limited to the RNFL thickness.

Concentric macular dark spots (CMDS):
the en-face tomographic feature of the DONFL

Retinal nerve fiber layer thickness

- At the sixth post-operative month, RNFL thickness was significantly lower than pre-operative values in the superotemporal, inferotemporal and temporal sectors.

- Focal damage to inner retinal layers probably related to ILM peeling, with subsequent axonal transport alterations and apoptotic and atrophic degeneration of the ganglion cells in the posterior pole.


Balducci et al. RNFL thickness modification after ILM peeling. Retina 2014.
Six months after surgery, the microperimetry showed more numerous and deeper **microscotomas** in the Group A (active peeling) than in the Group S (spontaneous peeling)

- 63.6% of Group A patients and 20% of Group S
The site of microscotomas frequently consisted in the peeling initiation areas suggesting that they may be secondary to mechanical injury induced by the forceps.
Conclusions

- Most of the cases ILM is already peeled:
  - Simultaneous ILM peeling is frequent when there is a complete or broad ERM adhesion on preoperative SD-OCT

- ILM active peeling:
  - Does not improve outcomes (BCVA, CRT) in RCT
  - Does not reduce recurrences in modern surgery
  - Has side effects
Conclusions

ILM peeling in macular pucker:

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### Pros vs Cons

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Thank you