Recurrences of Epithelial Ingrowth Managed with Adhesive Assistance

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Have done research, consulting, or speaking for:
- Allergan, AMO, Calhoun Vision, QXL, AM-1, EB, Nanonentreprise, Cibodes, OIS, Qantel, TLCV
Some of the information may represent off-label uses of approved drugs or devices

Epithelial Ingrowth

Complication of LASIK surgery
- Incidence 0.5 to 15%
- Usually observed in first few weeks
- May be nonprogressive or progressive
- In most advanced stage may result in flap melt

Signs
- Isolated nests/sheets of cells
- Decreased UCVA and/or BCVA
- Induced astigmatism on refraction
- Irregular astigmatism on topography
Treatment - Removal

Removal
- Lifting and scraping epithelial cells
  - Blunt spatula, Merocel sponge
  - Ethanol used to supplement complete removal
  - MMC – has no role in management
  - PTK to remove additional cells can induce significant irregular astigmatism
- Nd:YAG Laser treatment
  - Useful for stable pockets of ingrowth where the elevation of the cornea causing changes in comfort or vision

Treatment – Prevention of Recurrence

Prevention of Recurrence
- Suturing flap edges
  - Induce striae, irregular astigmatism, requires suture removal, longer recovery
- Fibrin adhesive application
  - Useful for recurrent cases
  - Longer recovery

Tisseel Fibrin Glue

Baxter (tissuesealing.com)
- Mixture of:
  - Fibrinogen & Thrombin
  - Also has fibrinolyis inhibitor (bovine)
  - Mixed on surface of the eye
  - 30-60 seconds to manipulate it
  - Thrombin can be diluted to slow the setting time
  - 8-10 minutes to dry so BSCL can be placed
  - Dissolves in 10-14 days
Fibrin Adhesive for Multiple Recurrences
Soften Epithelium Around Gutter

Fibrin Adhesive for Multiple Recurrences
Remove Epithelium around Gutter

Fibrin Adhesive for Multiple Recurrences
Remove Epithelium from Stromal Bed & Gutter
Fibrin Adhesive for Multiple Recurrences
Remove Epithelium from Back of Flap

Fibrin Adhesive for Multiple Recurrences
Apply Fibrin Portion of Sealant (Blue/Thick)

Fibrin Adhesive for Multiple Recurrences
Apply Thrombin Portion of Sealant (Black/Thin)
Fibrin Adhesive for Multiple Recurrences
Allow Glue to Dry

Postoperative Day 1
Fibrin Adhesive following RK & LASIK

Results in Study of 39 Eyes

Fibrin Glue
LASIK surgery
Epithelial ingrowth recurred despite prior removal or enhancement

Results
Following LASIK enhancement: 32 eyes
Following RK: 1 eye
Subluxed flap: 4 eyes
No obvious risk factors: 2 eyes

Prior Removals
9 eyes with prior removals
Up to 5 removal attempts previously

Success
No recurrence: 79.5%
3 clinically significant recurrences requiring subsequent removal (7.7%)
One patient combined with 10-0 nylon and 10-0 polyglactin sutures due to high fistula
Average 23.0 ± 19.1 months follow-up

Hardten, et. Al., JCRS 2014, Combination of MEC & Duke University Eyes
Results

Eyes with > 3 months follow-up (3 to 66 months):
- Two eyes underwent flap amputation due to irregular astigmatism.
- One eye had ectasia with subsequent Intacs placement
- One eye had poor vision from glaucoma (2/200 to CF)
- 92.3% had unchanged or improved BCVA
- 5.1% lost one line of BCVA
- BCVA improved from 61% with 20/25 BCVA preop to 76% at 3 months postop and 84% at last follow-up.

Nd:YAG Laser

Epithelial Ingrowth Removal
- 0.6 mJ
- Variable number of spots depending on amount of ingrowth
- 40% of cases required 2 or more sessions

Epithelial Ingrowth

Nd:YAG Laser
- 30 eyes
- Starting in the center of the ingrowth
- Average energy 0.6mJ
- FML TID 2 weeks postop
- Opacities resolve fully in 80%
- Mild opacity remained in 20%
Epithelial Ingrowth

Nd:YAG Laser

Before  Immediately After  2 months after


Conclusions

Fibrin Adhesive
- Tisseel/Artiss may be a useful adjunct in epithelial ingrowth removal in complicated cases
- May reduce incidence of recurrent epi ingrowth
- Tisseel/Artiss is well tolerated and there were no complications associated with its use
- Larger randomized studies would be needed to determine safety and efficacy of this technique as compared to primary removal or sutures
- Nd:YAG may be useful for stable long-standing ingrowth destruction