Managing Recurrences of Epithelial Ingrowth with Adhesive Assist

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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 fibrinolysis 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
Softens 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)
Results in Study of 39 Eyes

Fibrin Glue

- LASIK surgery
- Epithelial ingrowth recurred despite prior removal or enhancement

Results:
- Following LASIK enhancement: 32 eyes
- Slipped flap: 1 eye
- SLT/LASIK enhancement: 4 eyes
- No obvious risk factors: 2 eyes

- 9 eyes with prior removals
- Up to 5 removal attempts previously

Success:
- No recurrence: 78.5%
- 2 clinically significant recurrences requiring subsequent removal (7.7%)
- One patient combined with 10-0 polyglyconate 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

Hardten, et. al., JCRS 2014; Anderson, et. al., JCRS 2003;29:1425   Ayala, et. al., AJJO 2008;145:630