

Post-LASIK Epithelial Ingrowth Removal

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Have done research, consulting, or speaking for:
Allergan, AMO, Calhoun Vision, CXL-USA, ESI, Humanoptics, Oculus, OSD, Quantel, TLCV
Some of the information may represent off-label uses of approved drugs or devices



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Epithelial Ingrowth

Complication of LASIK surgery

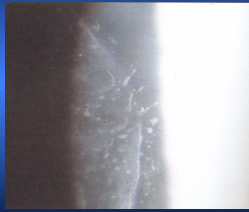
- Incidence 0.5 to 15%
- Usually observed in first few weeks
- May be nonprogressive or progressive
- In most advanced stage may result in flap melt



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Signs

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



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Treatment - Removal

Removal

- Lifting and scraping epithelial cells
Blunt spatula, Merocele 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



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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



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Tisseel Fibrin Glue

Baxter (tissue sealing.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



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**Fibrin Adhesive for Multiple Recurrences
Soften Epithelium Around Gutter**



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**Fibrin Adhesive for Multiple Recurrences
Remove Epithelium around Gutter**



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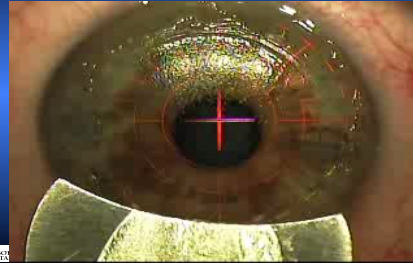
**Fibrin Adhesive for Multiple Recurrences
Remove Epithelium from Stromal Bed & Gutter**



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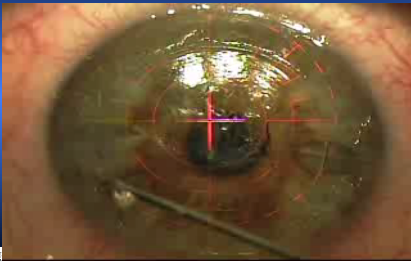
**Fibrin Adhesive for Multiple Recurrences
Remove Epithelium from Back of Flap**



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



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**Fibrin Adhesive for Multiple Recurrences
Apply Thrombin Portion of Sealant (Black/Thin)**



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Fibrin Adhesive for Multiple Recurrences Allow Glue to Dry

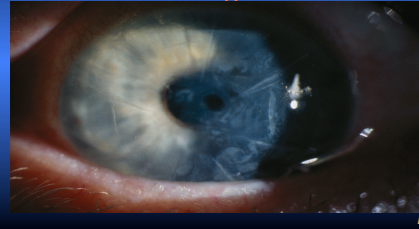


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Postoperative Day 1

Fibrin Adhesive following RK & LASIK



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Results in Study of 39 Eyes

Fibrin Glue

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

Risk factors present

- Following LASIK enhancement: 32 eyes
- Slipped Flap: 1 eye
- S/P RK and LASIK enhancement: 4 eyes
- No obvious risk factors: 2 eyes

Prior keratomaxia

- 9 eyes with prior removals
- Up to 5 removal attempts previously
- Mean 1.7 ± 1.3 removal attempts

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

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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.

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Nd:YAG Laser

Epithelial Ingrowth Removal

- Ayala, et. al.: AJO 2008;145:630.
- 0.6 mJ
- Variable number of spots depending on amount of ingrowth
- 40% of cases required 2 or more sessions

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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%

Ayala, et. al.: AJO 2008;145:630



FIGURE 1. Photograph from Case 1 showing very dense epithelial ingrowth with bubbles in the area treated with neodymium:yttrium-aluminum-garnet (Nd:YAG) laser.

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Epithelial Ingrowth

Nd:YAG Laser

Before

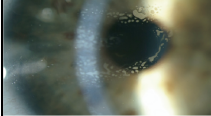


FIGURE 3. Photograph from Case 2 showing epithelial ingrowth previous to treatment.

Immediately After

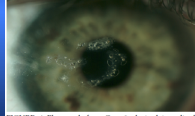


FIGURE 4. Photograph from Case 2 obtained immediately after treatment with Nd:YAG laser. The holes in the epithelial ingrowth area are observed.

2 months after

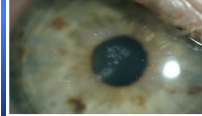


FIGURE 5. Photograph from Case 2 obtained two months after carrying out Nd:YAG laser treatment showing stable minimum epithelial ingrowth.

Ayala, et al.: AJO 2008;145:630.



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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
- Reports of ReSure along the graft edge shows it may also be useful
Yesilirmak, et al., JRS 2015;31:275
- Nd:YAG may be useful for stable long-standing ingrowth destruction
Hardten, et al., JGRS 2014, Anderson, et al., JGRS 2003;29:1425 Ayala, et al., AJO 2008;145:630



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