

Epithelial Ingrowth following Enhancement with Hypertonic Saline

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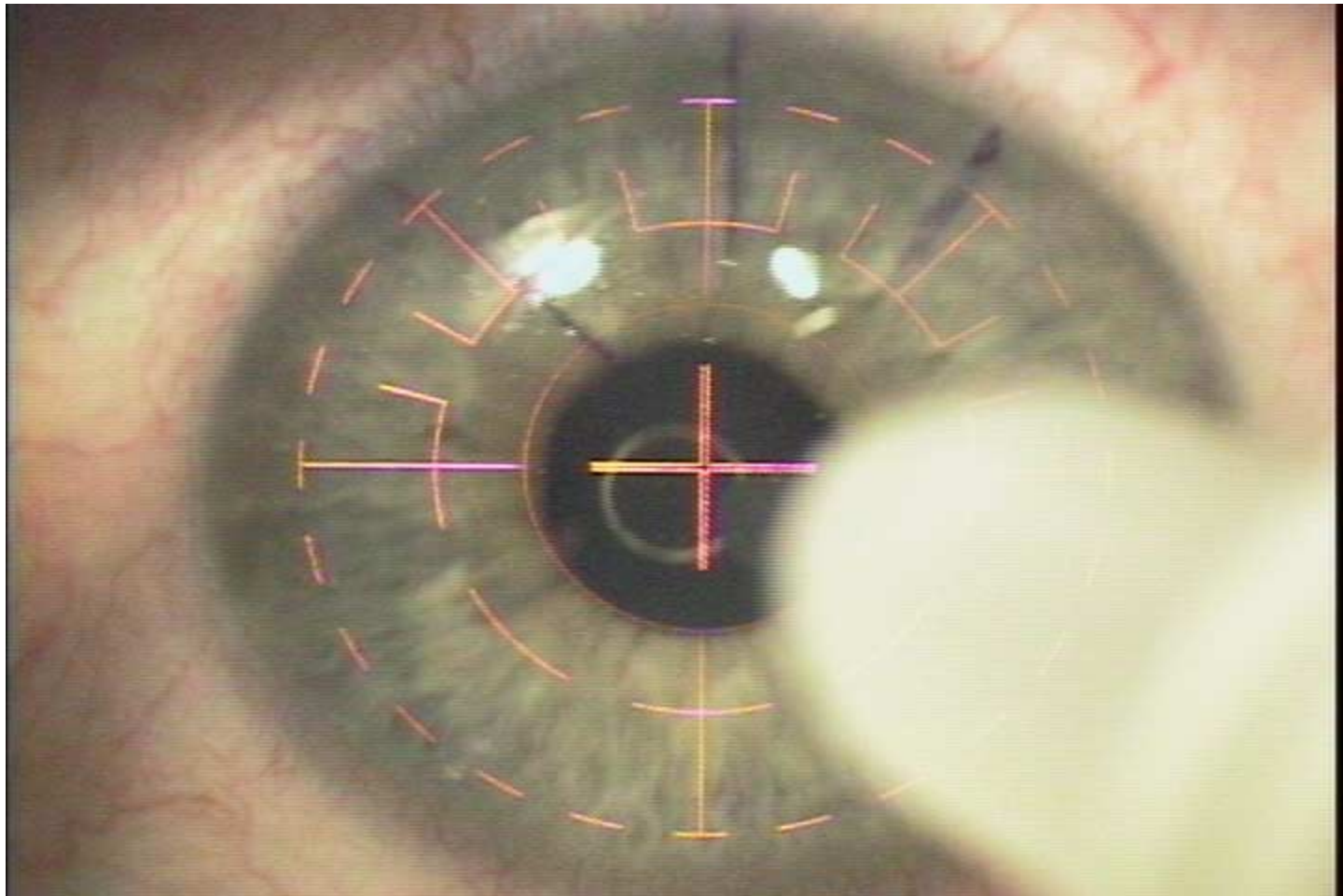


Purpose

- 318 primary and enhancement LASIK surgeries (done by MEJ)
- Prospective, nonrandomized, consecutive series
- 5% Saline (NaCl) was administered immediately after surgery

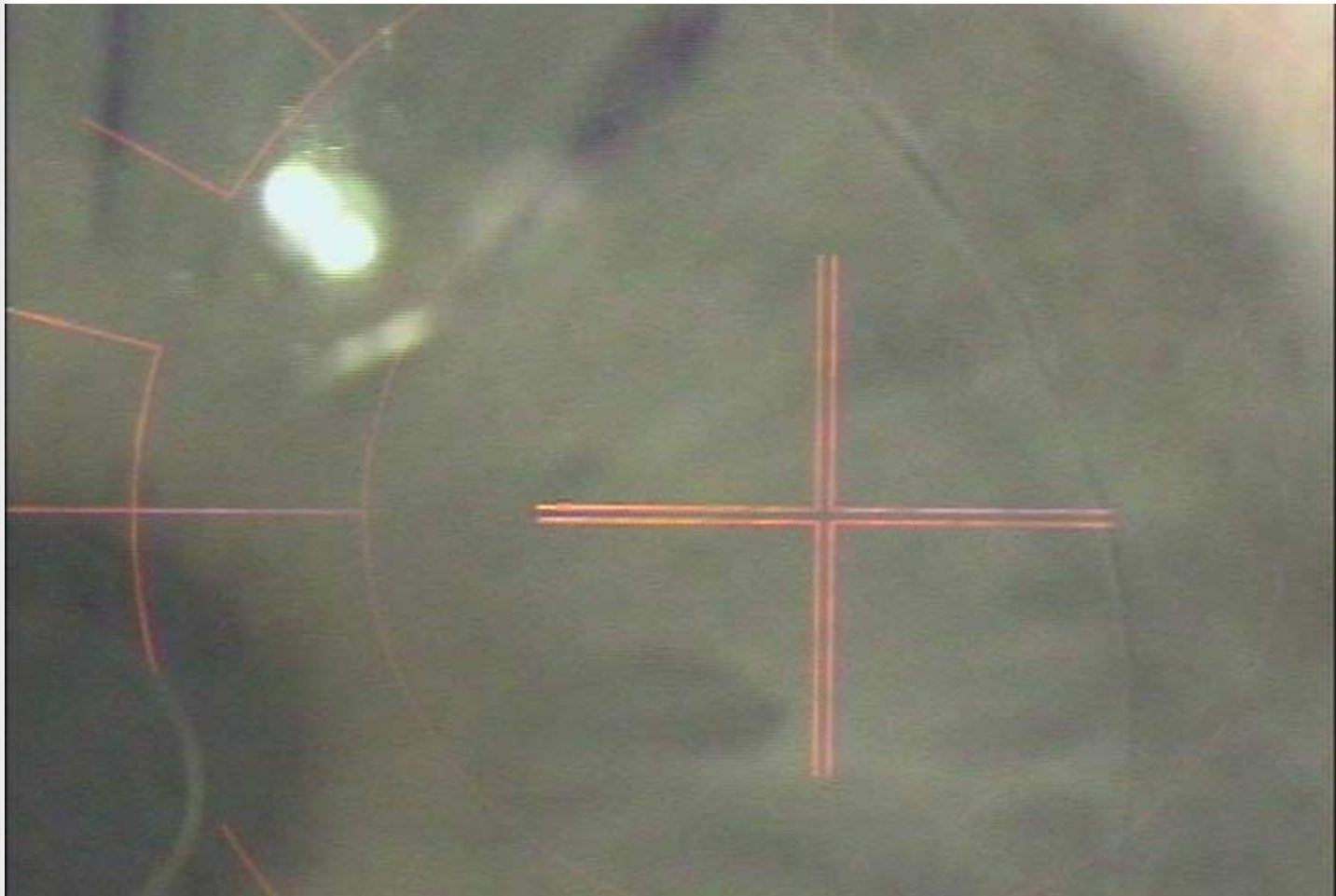
Cornea before adding 5% NaCl

Note the clarity of the epithelium



Epithelium with 5% NaCl

note the whitening (denaturation) of epithelium

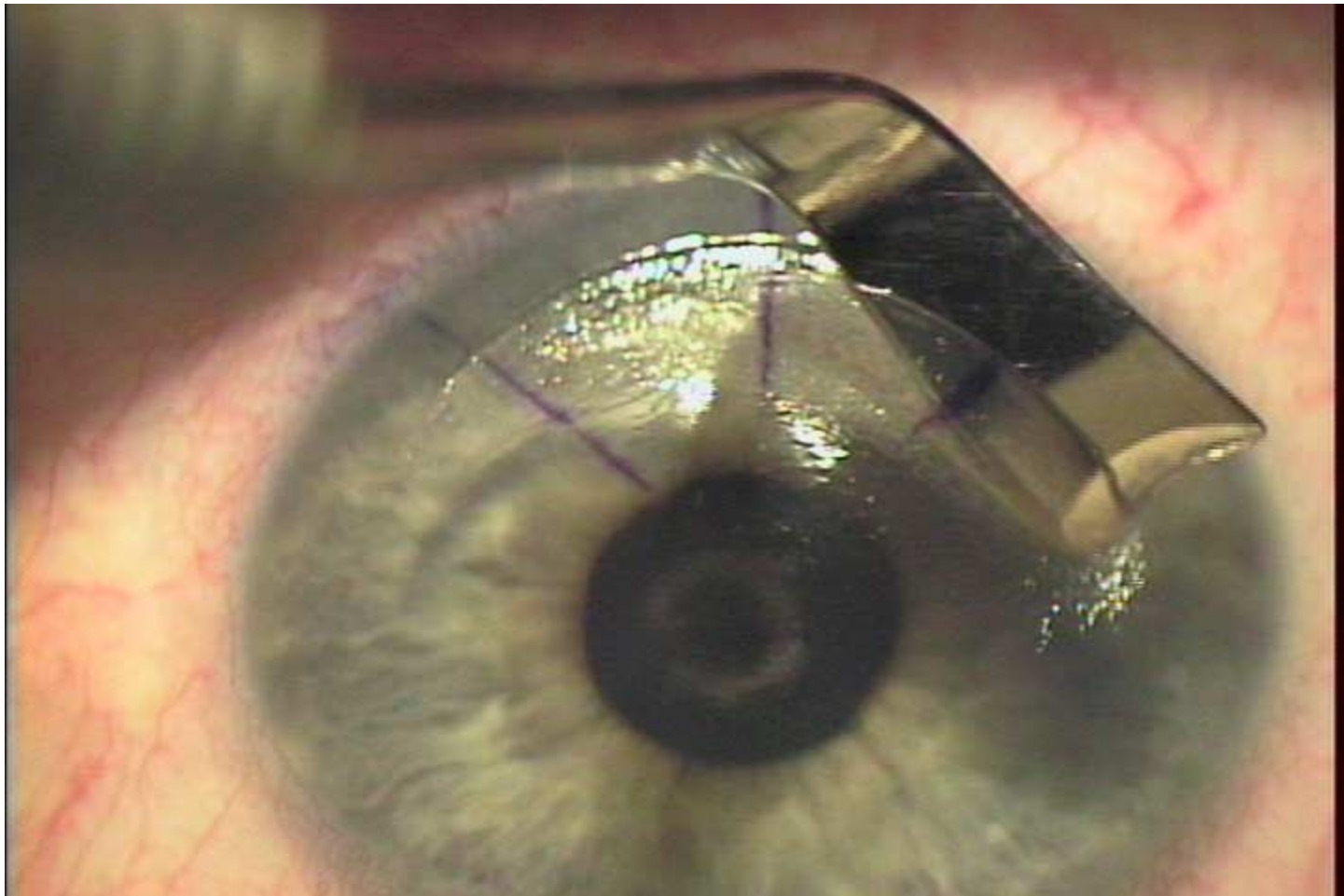




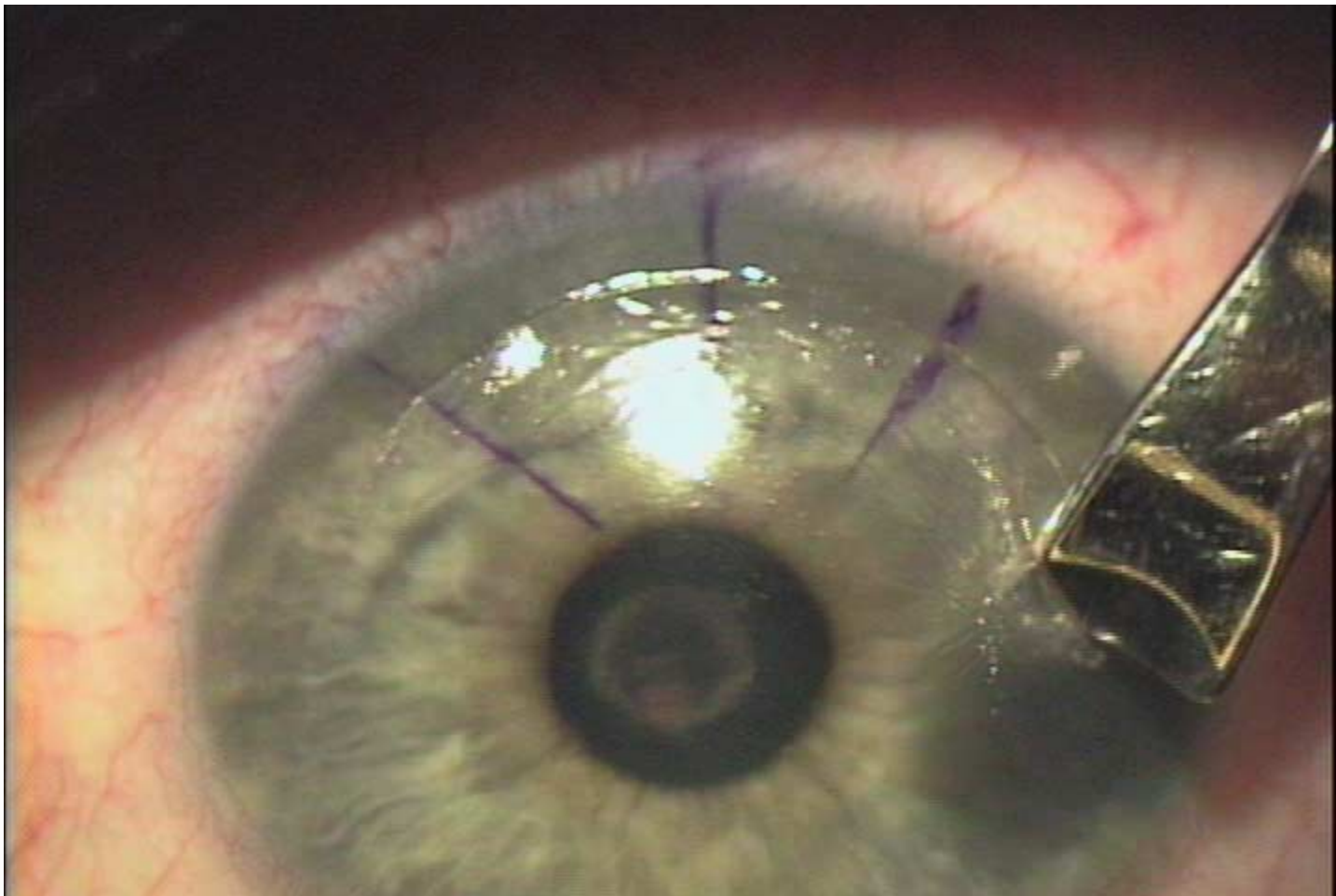
Method

- Results of routine and enhancement surgery were monitored for any increase or decrease in flap complications compared to previous experience (over 4500 cases).
- This series contains a higher percentage of hyperopic enhancements than the historic control group.

Flaps were lifted following circumferential opening of the epithelium with a Kritzinger spatula



Flap delineation with the elevator

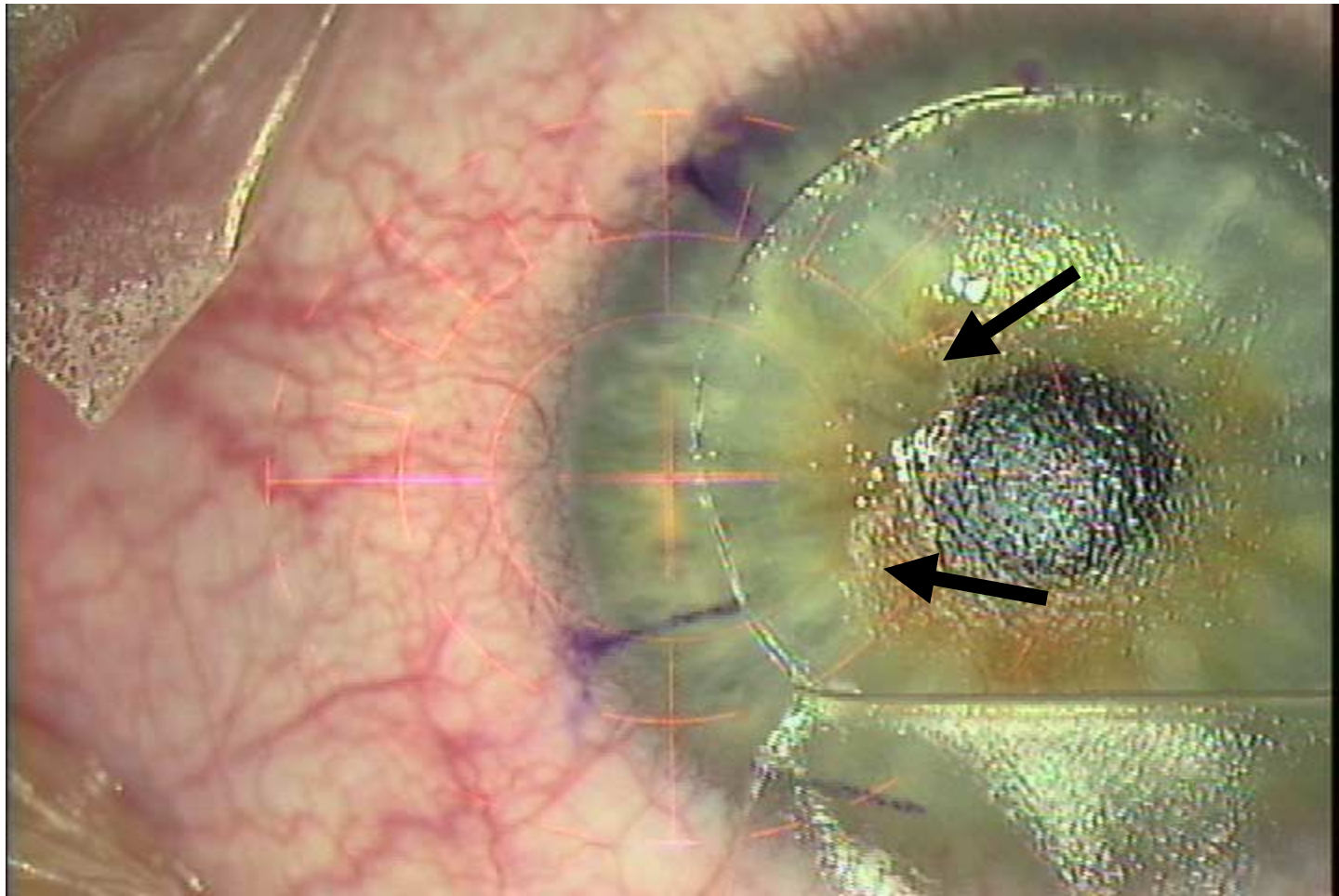




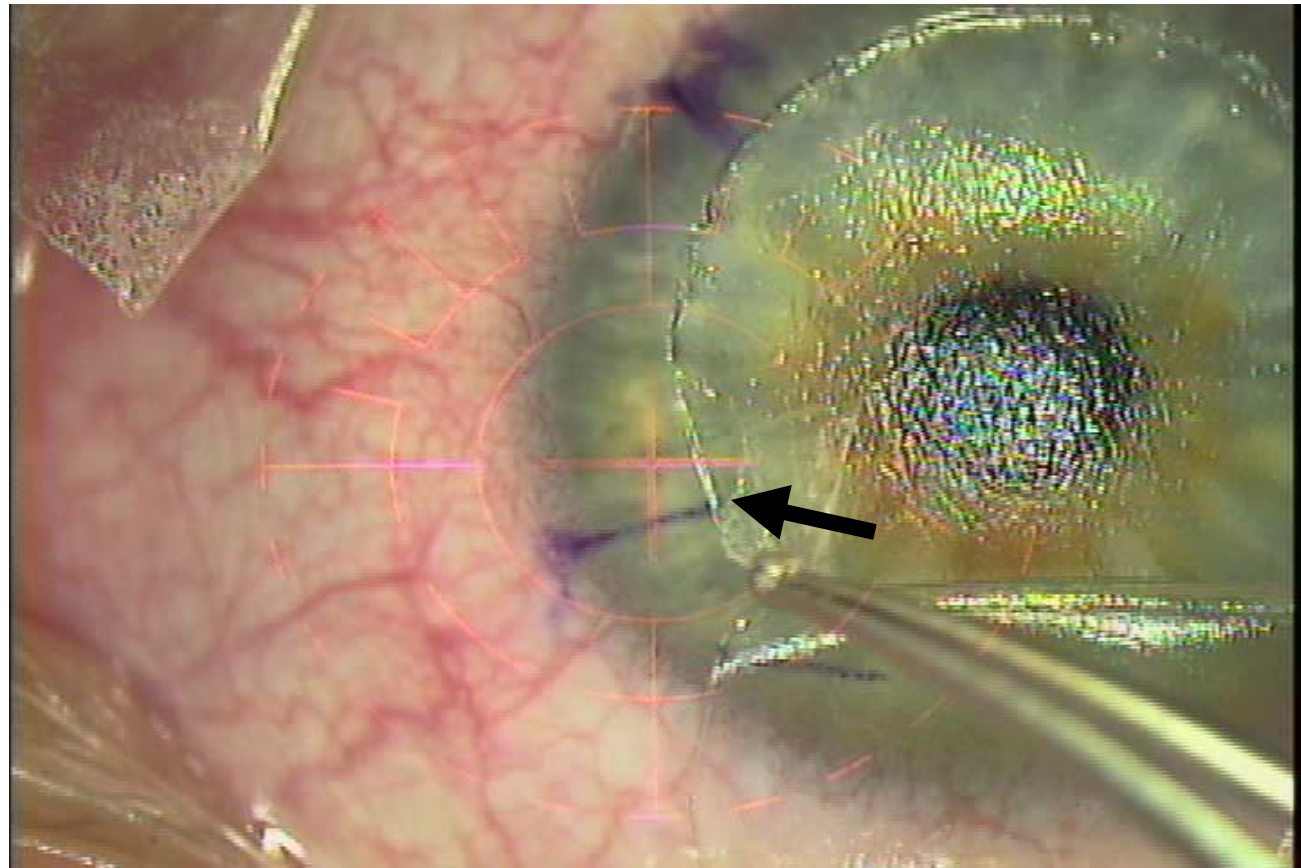
Results

- 57 eyes had routine enhancements,
- 5 cases of epithelial ingrowth required surgical removal
- 1 case in the historic control group required surgery(about 400 enhancements)

Note the edge of the epithelial ingrowth



Sheet of epithelial ingrowth
removed with Burrato forceps



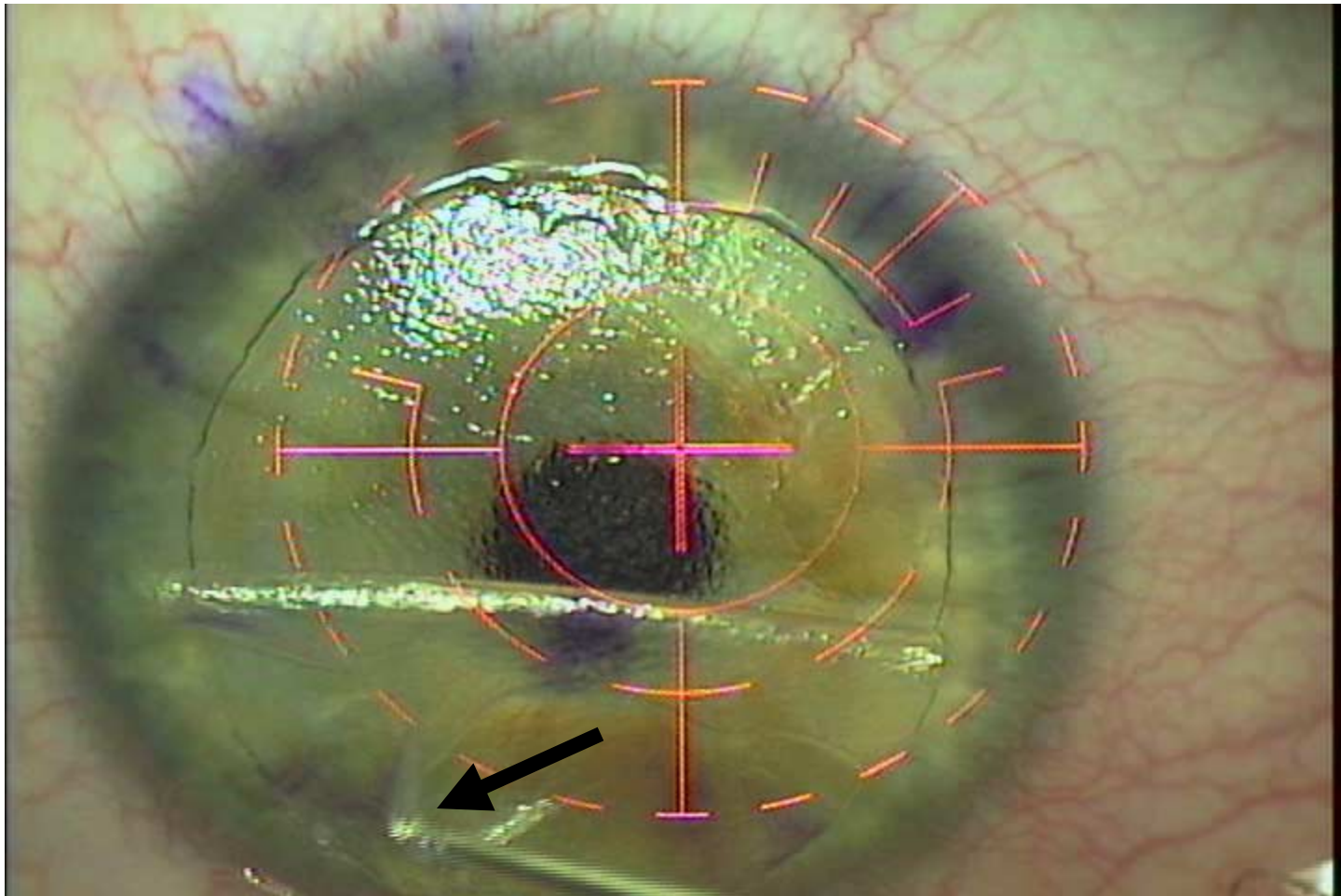


Results

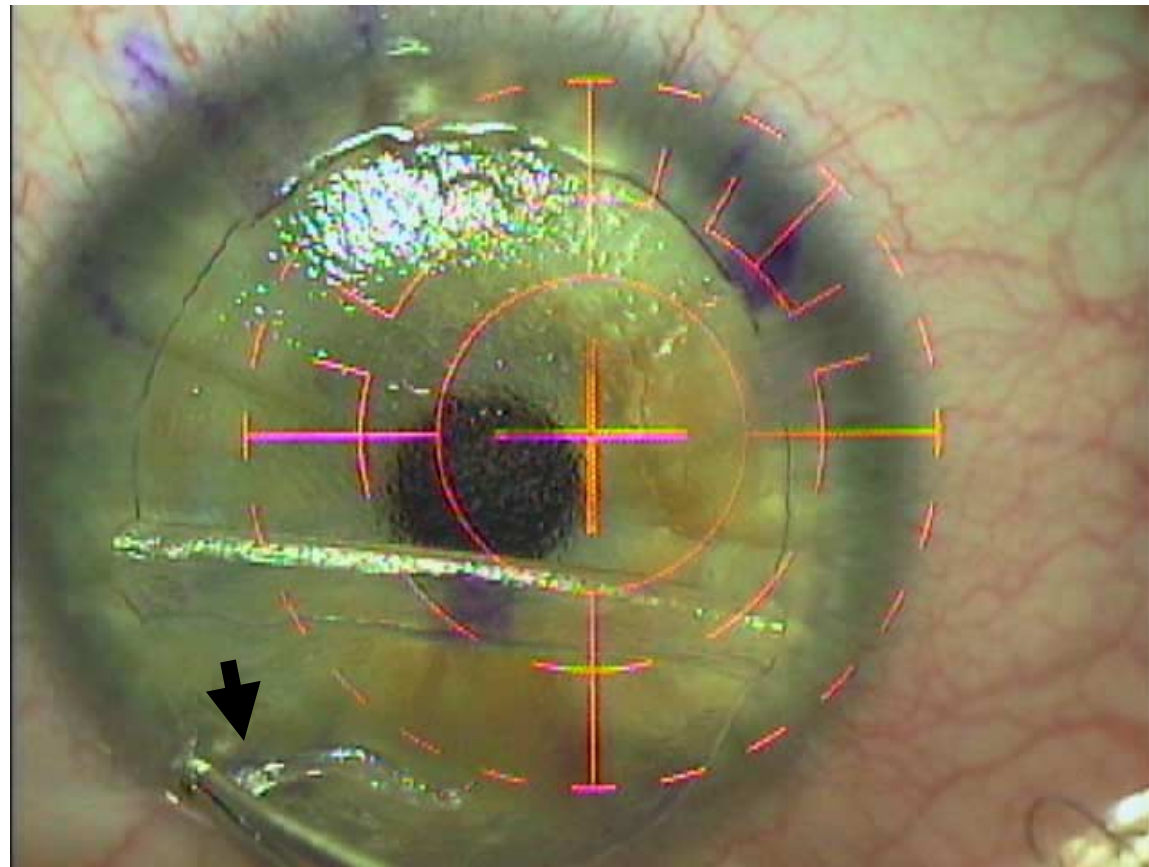
Ingrowth occurred in:

- 4 of 25 patients having a hyperopic correction
- 1 of 30 cases having myopic/mixed correction.

Sheet of epithelium lifting off the posterior surface of the flap



Sheet of epithelium being
removed from the posterior flap





Results

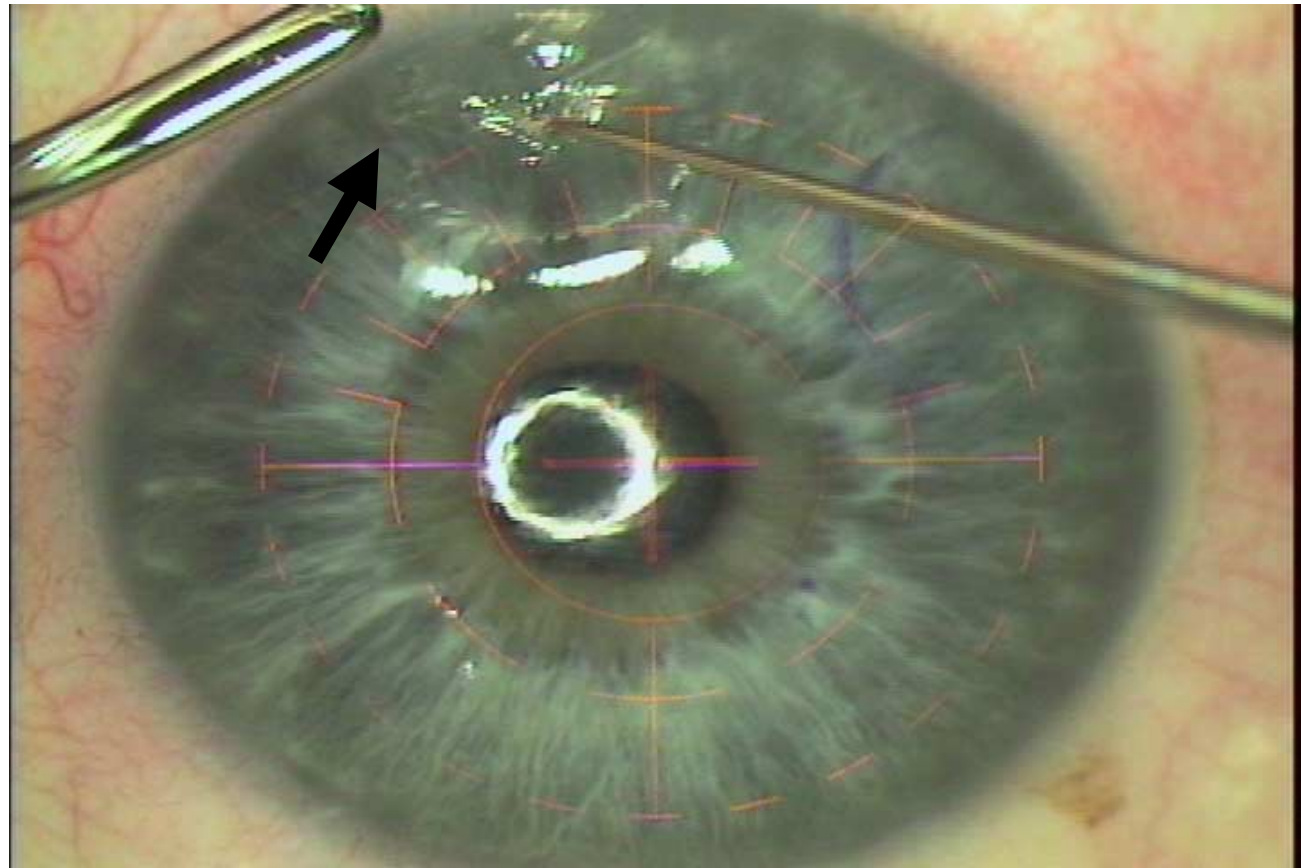
- Ingrowths were not clinically significant at the one day and one week evaluation but were evident at one month.
- None of the primary cases in this series required surgical removal of epithelial ingrowth.



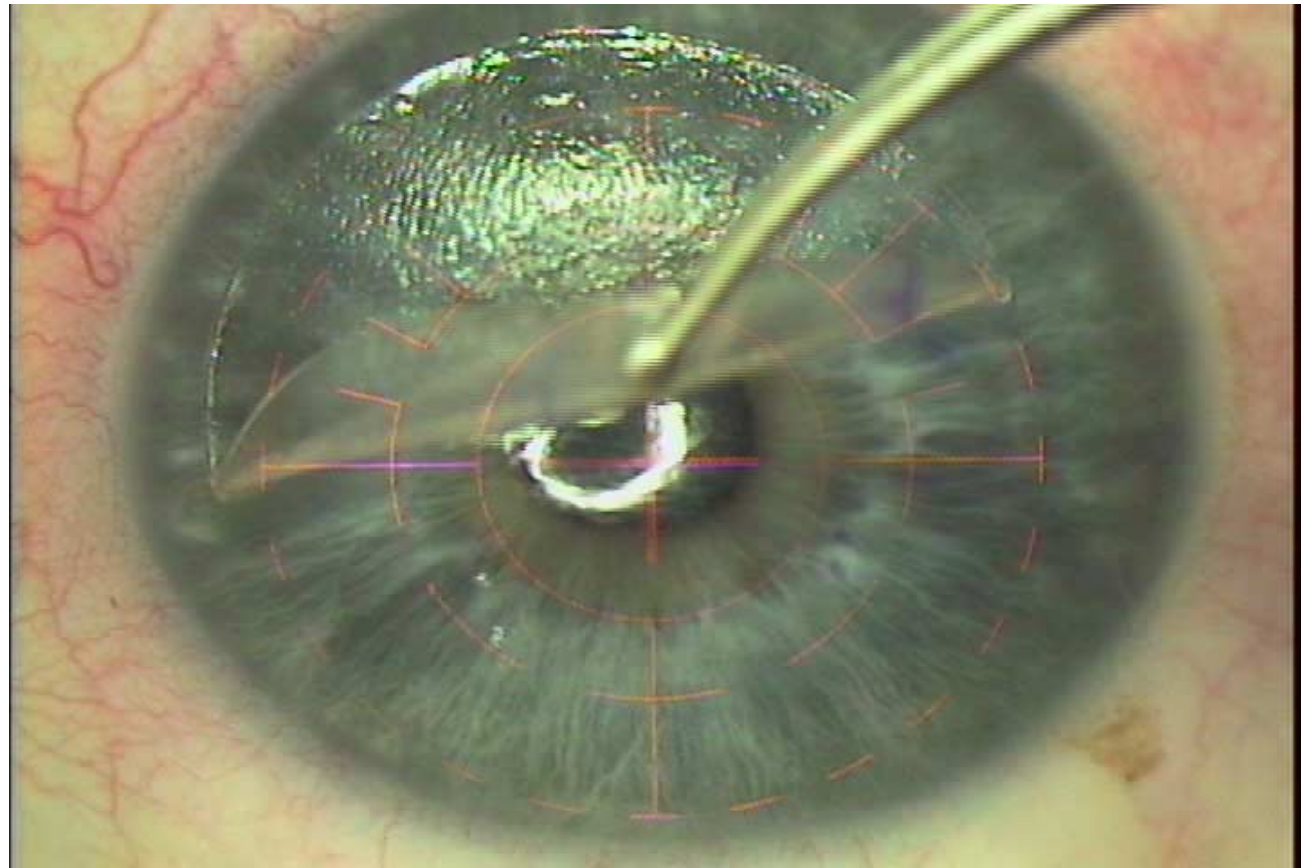
Results

- Hypertonic saline has not been used since this increase incidence of ingrowth was noted.
- As well the enhancement technique was changed such that the inferior cornea is grasped and lifted with a Burratto Enhancement Forceps with secondary epithelial rehexis.
- Only one further case of ingrowth requiring removal have been noted.

Opening the inferior flap edge



Epithelial rhexis with Burratto forceps





Discussion

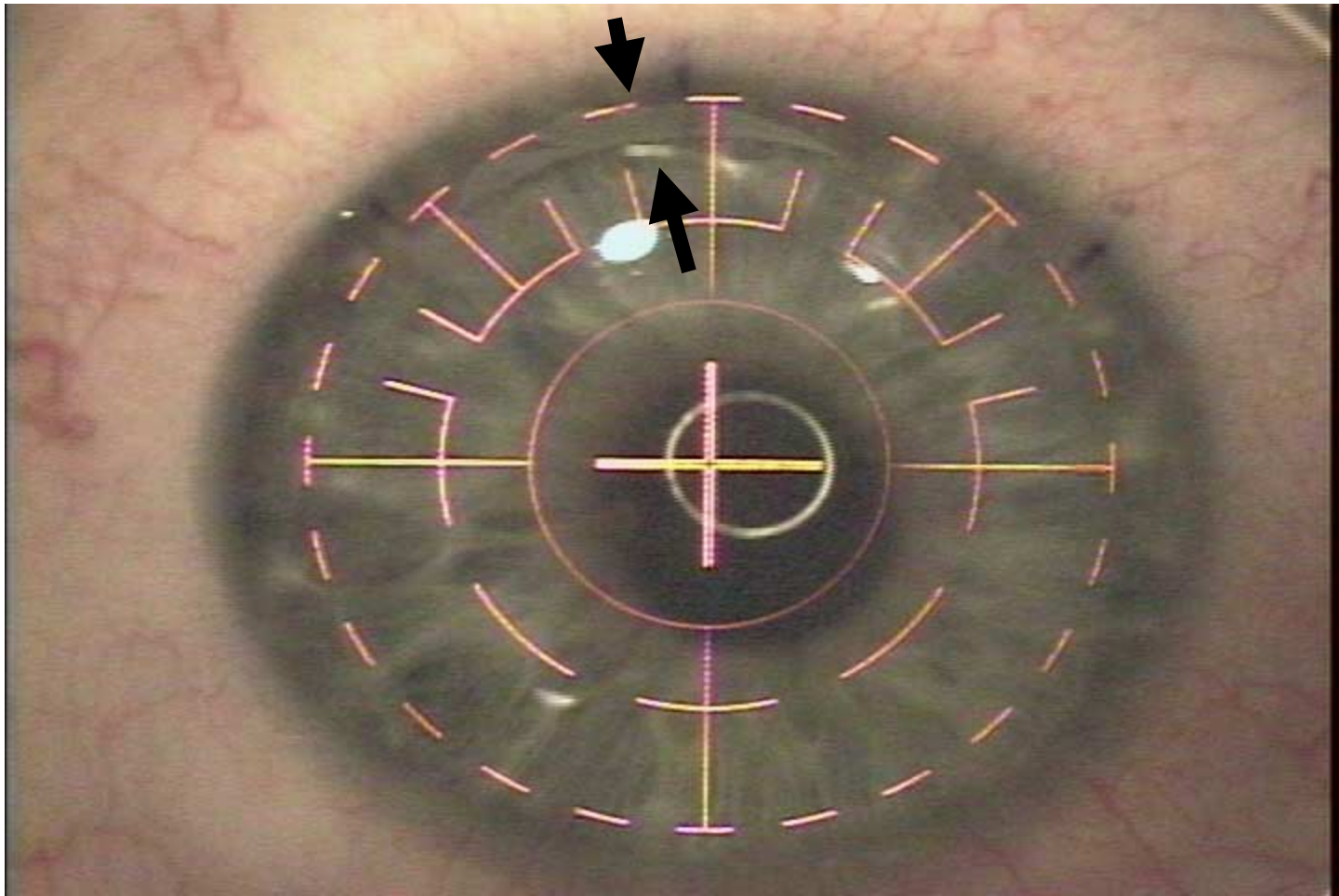
- Presumed laser damage to the epithelium with wide zone in hyperopic treatments



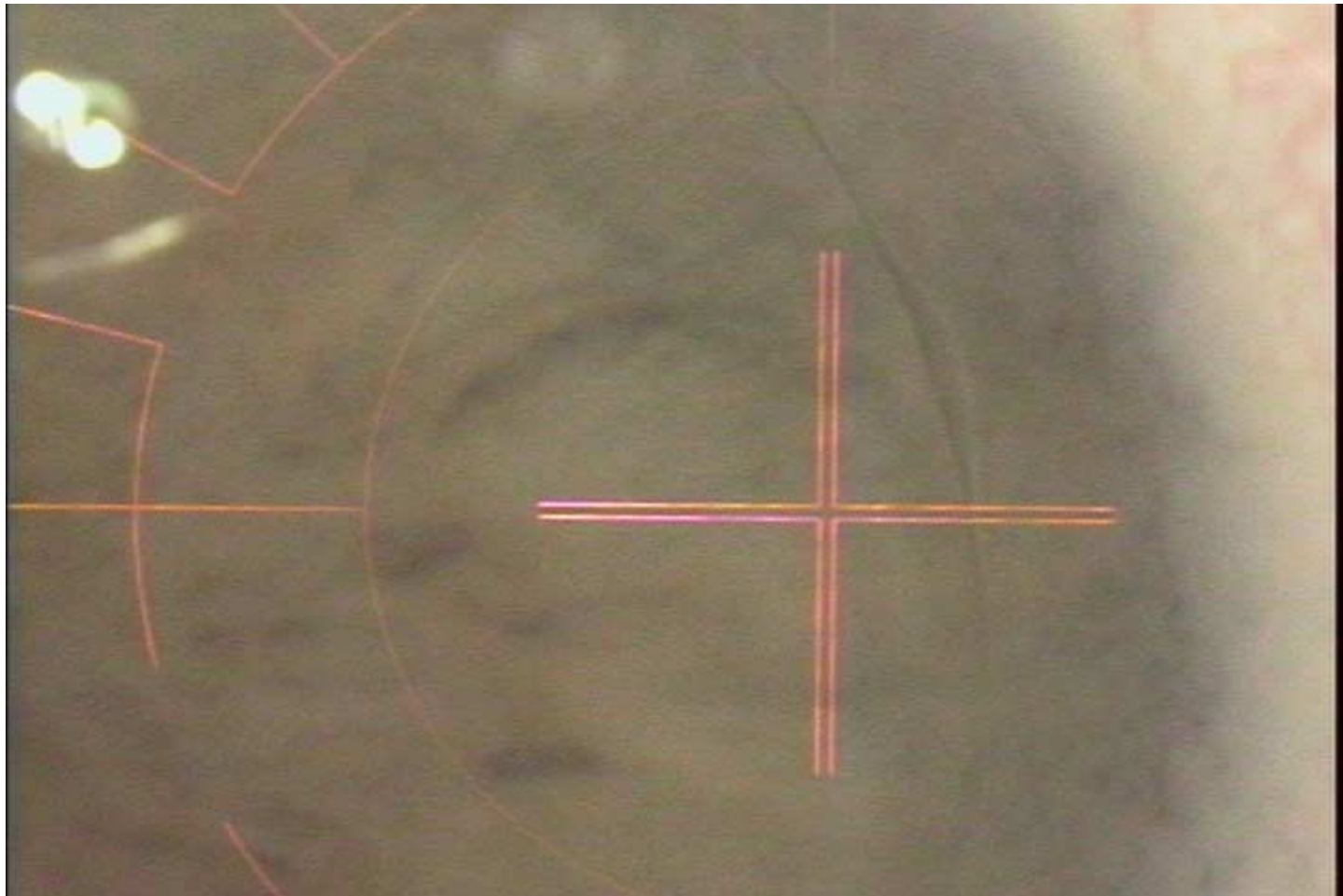
Discussion

- Transient epithelial denaturation noted with 5% Saline suggest epithelial damage may be a factor in the etiology
- Noticeable gutter when 5% saline used suggest a biophysical component related to widening of the gutter

Loose epithelium denatured with 5% NaCl



Epithelium with 5% NaCl
gutter widening related to lift





Conclusion

- Hypertonic saline is associated with an increased incidence of epithelial ingrowth following Lasik enhancements.
- No such association is noted in primary cases.



Conclusion

- Damage to the epithelium must be minimized during enhancement surgery
- Hypertonic Saline (5% NaCl) has a detrimental effect on the epithelium

