Presented will be worst case-scenarios in refractive surgery that can cause the best surgeon to have nightmares. Management of these situations (e.g., flap complications, decentered ablations, and iatrogenic ectasia) will be covered. The presentation format will be videos.

**Course Description**

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**Senior Instructor:** Athiya Agarwal, MD

Faculty:
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Inflammation of the Interface: DLK / SOS
(M Assouline)

Grade 2

Grade 3

Inflammation of the Interface DLK / SOS

- Diffuse Lamellar keratitis / Wavy infiltrate (Sands of Sahara / SOS)
- BEWARE: percolation of aqueous > glaucoma
- Pathogenesis
  - Endotoxins (tears, spears, blade, instruments, PLASTER dust)
  - Inflammation cells => enzymes => necrosis
- Prevention & Management
  - Based on visual acuity, evolution and confluence
  - Steroids (DXM x8)
  - Interface washing DXM + cold BSS
  - DO NOT TREAT MORE THAN 2 WEEKS
  - WATCH IOP AND CLEAN INSTRUMENTS
Inflammation of the Interface: DLK / SOS

(M Assouline)
Impending Stromal Melt

Inflammation of the Interface: DLK / SOS
Orbscan Artifacts
(M Assouline)

OD

OS

Before (270 µm)  After (480 µm)
Inflammation of the Interface: DLK Surgical Management (J. Assaf – Brussels)
Infection Fungal Keratitis (Acremonium)

(AJ Kanellopoulos)

1W

2W

3W

4W

Infection Fungal Keratitis (Acremonium)

(AJ Kanellopoulos)
Infection
Microbial Keratitis in LASIK

Incidence (0.05 – 0.2%)
Similar to other anterior segment surgery
Results can be devastating
- Flap necrosis
- Stromal scarring
- Visual loss

Infectious Keratitis in a 38y/o F MD post LASIK
Customized infectious keratitis treatment using the Avedro KXL II

20mW/cm², 7.2J continuous for 10'
Infection
Microbial Keratitis in LASIK
ASCRS Survey
- Mycobacterium
- Streptococcus
- Staphylococcus
- Fungal
- Gram negative
- Nocardia

Literature review
Survey results presented at ASCRS, Philadelphia, 2002. Results are pending publication in Journal of Cataract and Refractive Surgery.
Infectious Keratitis

- Incidence: 1/1000 to 1/5000 procedures (Under-reported?)
- Intraoperative intrastromal contamination likely
  - Sterility measures greatly vary, but are imperative
  - ABTs Prophylaxis is essential (Gram + eyelid flora)
- Differential diagnosis: DLK, debris, ABT/steroid deposits
- Fungal keratitis must be suspected when
  - Epithelium is intact
  - Multiple lesions (satellites)
  - Quiet eye (no pain !!)
- Difficult to diagnose and treat

Ectasia-pearls

- Pathogenesis/ Randelman criteria
  - Thin residual stroma (<250, <480)
  - Forme fruste keratoconus
  - Stromal lamellae shift
  - Refraction follow up
  - Elevation topography (Orbscan) BFS > 55 D, PostDiff > 50 μm
- Management
  - CXL
  - Intacs or even ALTK, DALK/PK
- Prevention
  - Detection => Phakic IOL for limit cases
  - Beware of enhancement procedures
8-is this post LASIK ectasia?
a-yes
b-no
c-do not know

Post-LASIK ectasia, or decentered hyperopic ablation?
Post-LASIK Ectasia?

Re-centering and normalizing an eccentric older LASIK (1997)
Topometric indices normalized, IHD and ISV appear most pivotal for CDVA

Post LASIK: what went wrong?
The 2 sisters! Normal?

IHD in OD abnormal!
Vision 20/20, is there progression?

Significant change in asymmetry!
“Currently sensitive criteria”

- Topometric asymmetry indices IHD and ISV
- Pachymetric asymmetry; Scheimpflug, OCT
- ART-Max=TP/PPI-Max (essentially “steep” cornea pachymetry change)
- Epithelial profiles
- Biomechanical measurements-Brillouin

Post LASIK ectasia: 26y/o pilot, from UCVA 20/60 to 20/15

The rare exception: The central cone
Does the epithelium tell the story here?

Normal?  KCN
Orbscan artifact

Surgical management of Ectasia
UV-CXL and TG-PRK
Topo-guided epi K with the Moria and Wavelight Eye-Q laser
improve -2.50 -4.50 cyl
6 months 20/20, +0.75 -0.50 cyl J Ophthalmol 2007
Surgical management of Ectasia
UV-CXL and maybe additional Topo-guided -PRK

Surgical management of Ectasia
UV-CXL and TG-PRK
Iatrogenic cone UCVA from 20/200 to 20/25
Topo-guided partial PRK

1-Topolyzer: Placido disc topography
2-Pentacam (Oculyzer)
3-Pentacam HD (Oculyzer II)-Refractive suite
4-Vario (placido disc + pupil sensor + iris recognition + limbal landmarks recognition)

Post LASIK ectasia: 26y/o pilot, from UCVA 20/60 to 20/15
The Athens Protocol 4 steps:
- 1- PTK
- 2- topo-guided PRK
- 3- 30" MMC
- 4- CXL

Step 4: attempted Rx to 0, OZ to 5 or 5.5mm, cyl axis to match topo axis not refractive axis
Why PTK epithelial removal?

New!!! Variable Fluence, topo-guided CXL
AP plus PiXL (variable fluence topo-guided CXL)
The advantage is marked normalization with less tissue removal
Summary

- DLK: aspirating speculum
- Single use instruments
- Control who and when gets in the LASER room
- Ectasia:
- Better pt selection
- Early diagnosis
- LASIK Xtra?
- Screen family if you can
Thank you