

# Surgical Management in Severe Ocular Surface Disease

David R. Hardten, M.D.

Minneapolis, Minnesota

Have done research, consulting, or speaking for:

Allergan, Avedro, AMO, ESI, Humanoptics, Oculus, OSD, Shire, Sightpath, TLCV

Some of the information may represent off-label uses of approved drugs or devices

# Surgical Management

## Ocular Surface Disease

- Typically the more severe cases
- Sometimes in combination with other procedures to improve results in combined disease
  - When surgery will exacerbate OSD temporarily
  - When surgery will exacerbate OSD permanently
  - When post-operative regimen will exacerbate OSD
- Maximize medical regimen before considering surgical



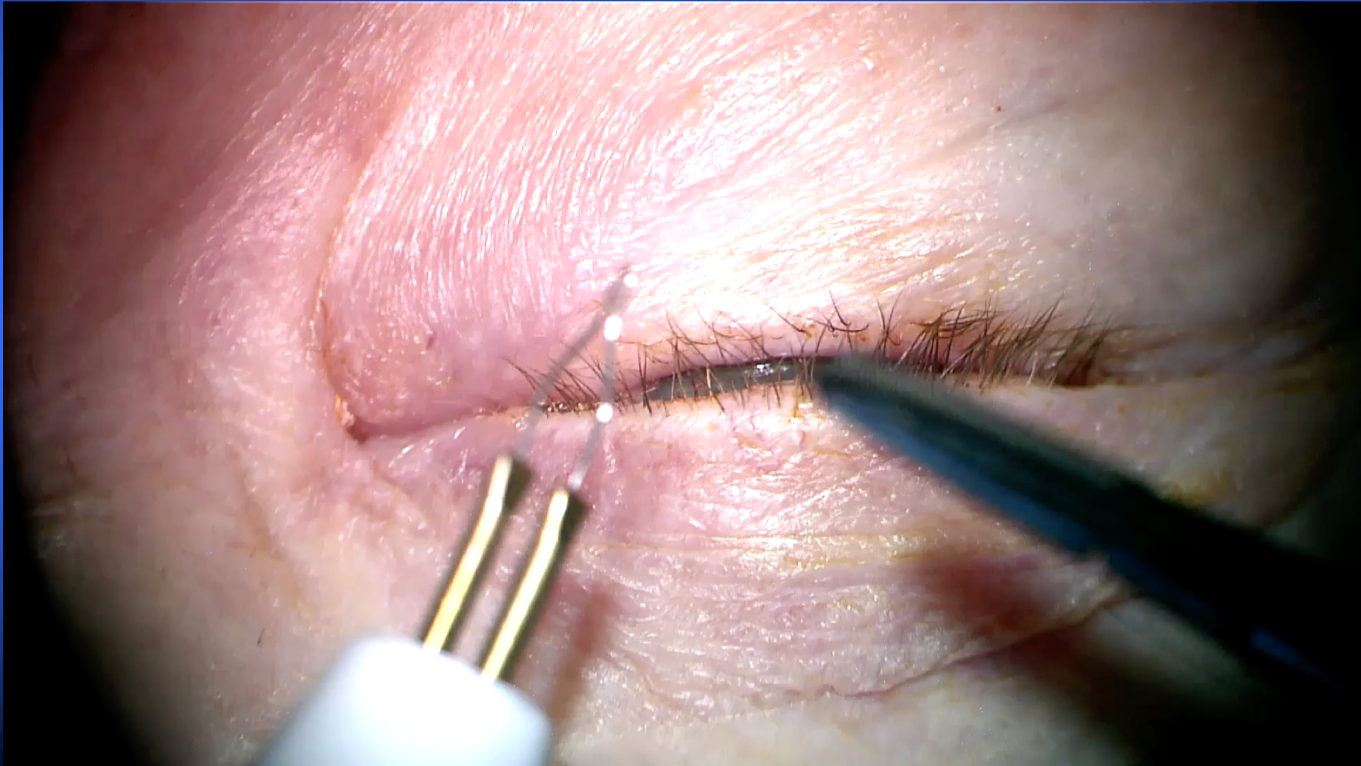
# Cauterization of Puncta

## Severe dry eye disease

- Maximize topical and medical management first
- Plugs are very useful for inferior puncta
- Long acting vicryl-type plugs may be used in upper puncta to verify that epiphora doesn't occur
- Osmolarity >308 to confirm that aqueous deficiency is a major component
  - If osmolarity is in “mostly evaporative” range – work to improve meibomian gland disease further before performing occlusion, otherwise epiphora may occur in future
- Typically cauterize upper puncta initially, and lowers if benefit from plugs of lower, but can't retain/tolerate
- My order for management if confirmed aqueous deficiency with occlusion:  
Inferior Plugs → Superior Vicryl Plugs → Superior Cautery Occlusion

# Superior Cautery Punctal Occlusion

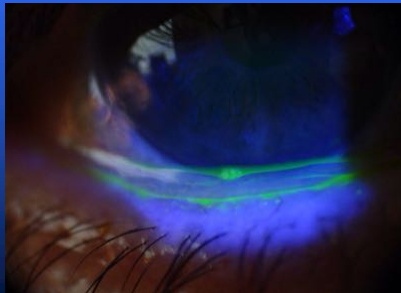
Video



# Conjunctivochalasis

## Characteristics

- Conjunctival folds between globe and lid
- Conjunctiva not adherent to tenon's capsule
- Thinning and stretching of the conjunctiva



# Conjunctivochalasis

## Risk Factors

- Age
- Chronic Inflammation:
  - Allergy
  - Dry Eye
  - MGD
  - Chronic Steroids
  - Postop Chemosis

## Symptoms

- Epiphora (mechanical blockage of puncta/gutter effect)
- Recurrent subconjunctival hemorrhages
- FBS



D.R. Hardten, M.D.

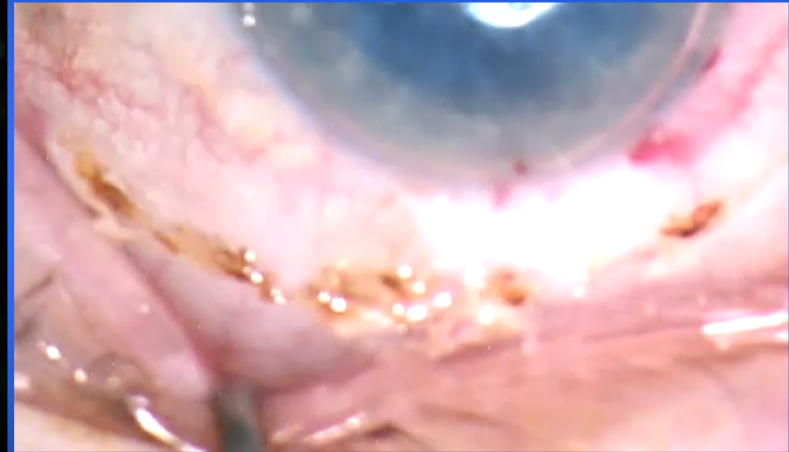
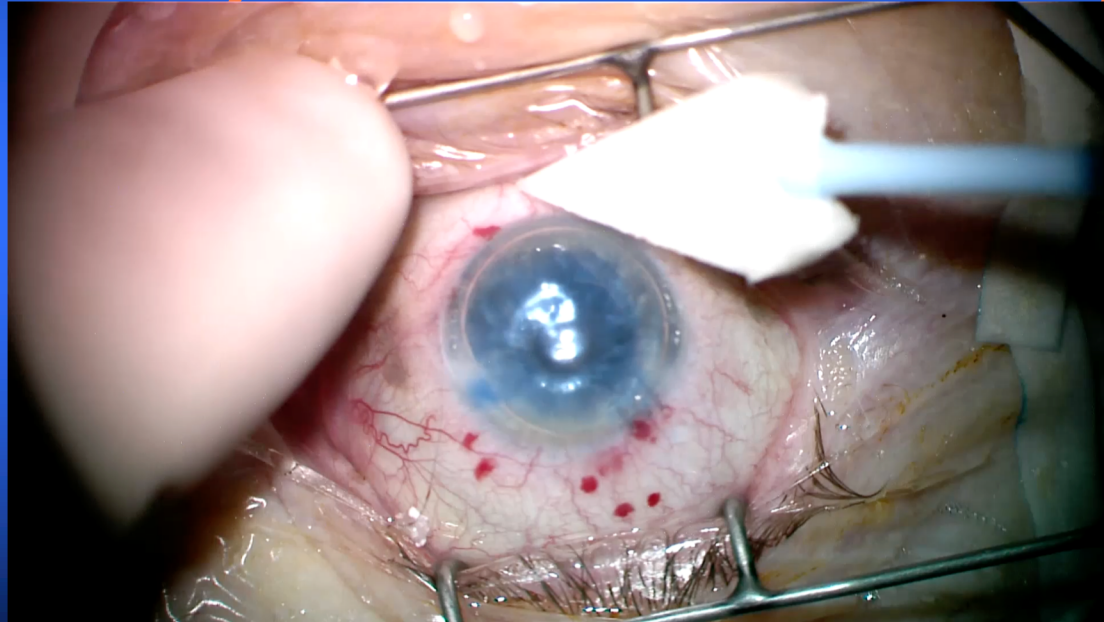
# Conjunctivochalasis

## Management

- Conservative treatment is initially similar to other OSD measures
- Consider antihistamines topically to reduce conjunctival edema
- Conjunctival resection and conjunctivoplasty are useful in resistant cases

# Cautery for Moderate Conjunctivochalasis

## Conjunctival Excision and Conjunctivoplasty



# Severe Conjunctivochalasis

---

## More significant resection and Amnion

- If do 360 degree resection
- Use amnion to cover conjunctival defects
- Temporary tarsorrhaphy
  - Nasal & Temporal
- Large BSCL

# Post-Operative Management

---

## Conjunctivochalasis

- Antibiotic/Steroid – 1 week or until amnion dissolved
- Pain control
- NSAID
- Lubrication & continue dry eye management



# Tarsorrhaphy

## Lid Closure-Reduction of Evaporation

- Temporary Tarsorrhaphy
  - Suture
  - Adhesive
  - Botulinum Toxin
- Lid Weight placement
  - Gold
  - Platinum
- Permanent Tarsorrhaphy

# Temporary Tarsorrhaphy

## Surgical Management of Severe Ocular Surface Disease

- Temporary Tarsorrhaphy

Useful adjunct when need 1 month of reduced evaporation when undergoing stressful situation

Peri-surgical due to corneal innervation reduction

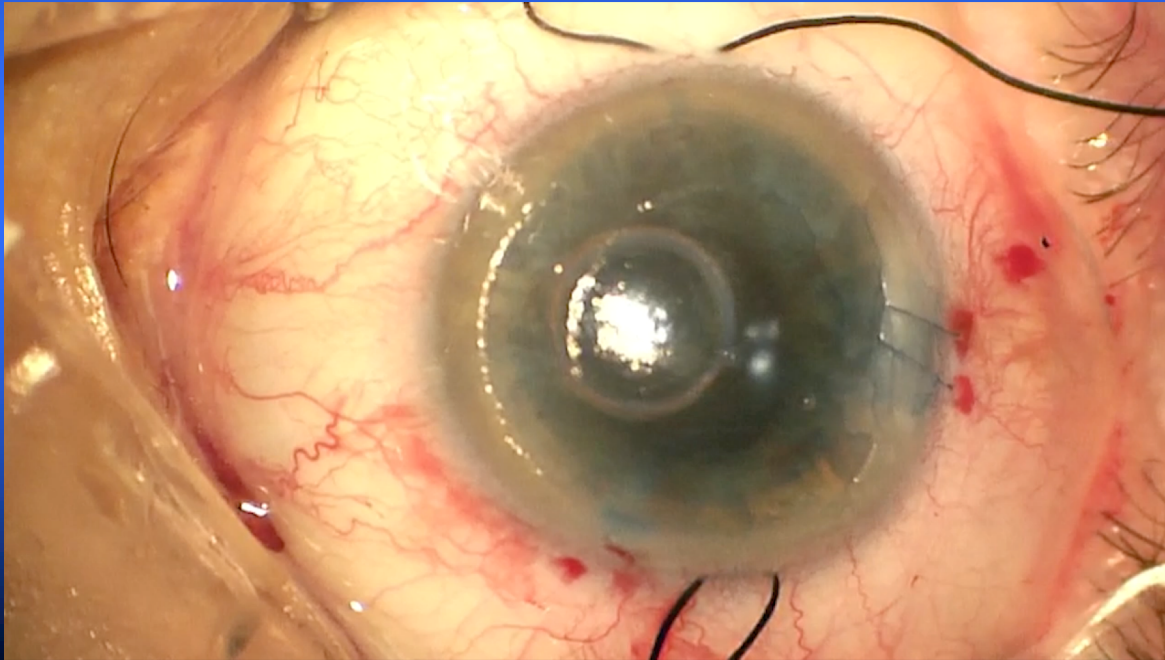
- Transplants

Peri-surgical due to aggressive drop regimens or surface disruption such as superficial keratectomy

- Cataract surgery
- Pterygium surgery
- Endothelial Keratoplasty

# Temporary Tarsorrhaphy

Surgical Technique (representative)



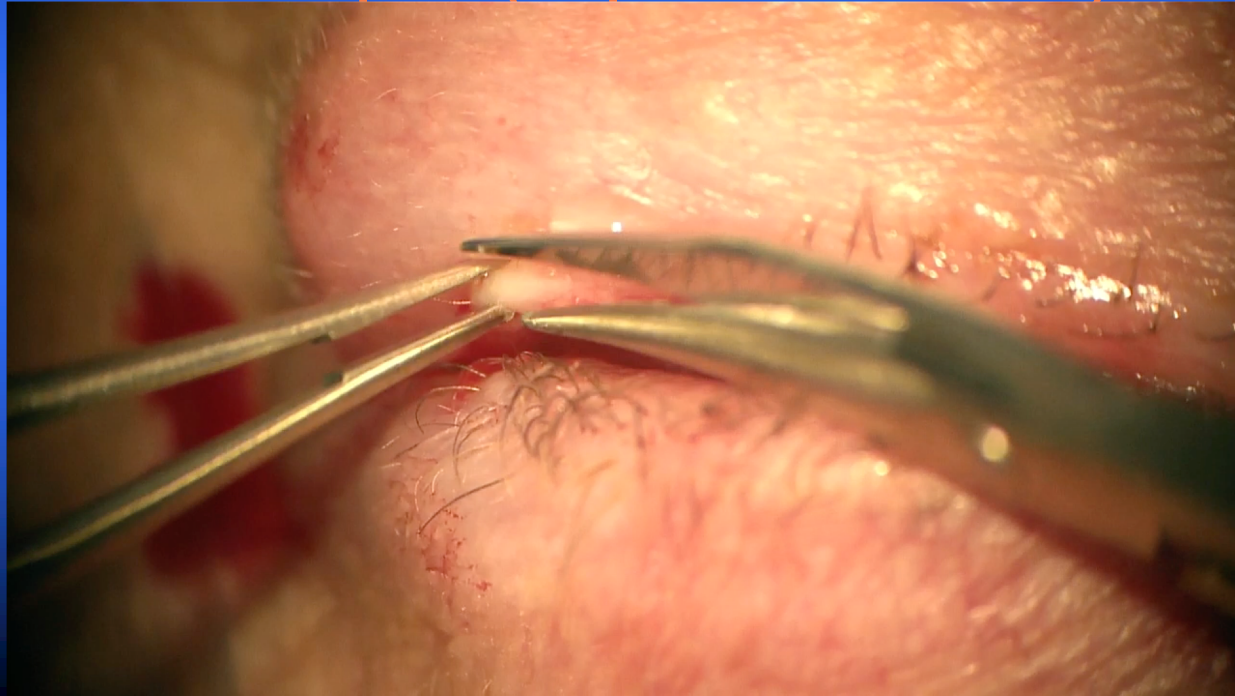
# Permanent Tarsorrhaphy

## Surgical Management of Severe Ocular Surface Disease

- Useful when need >1 month of reduced evaporation
- Neurotrophic keratitis
- Zoster (remember Shingrex now avail and doesn't require stopping antivirals)
- Stem Cell Deficiency
- Multiple failed transplants associated with prior persistent superficial keratitis

# Permanent Tarsorrhaphy

Surgical Technique (representative)



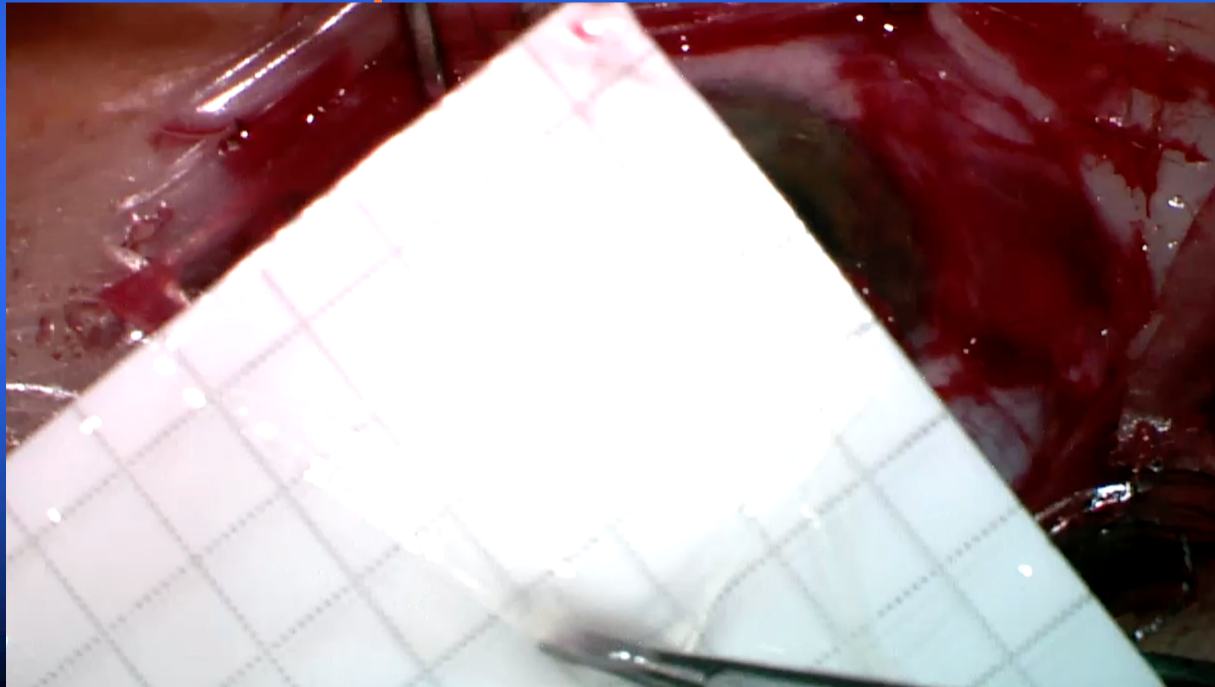
# Amniotic Membrane

## Sewn in Amniotic membrane

- Useful when need improvement in OSD for 1-2 months and/or combined with other procedures
- Often used in combination with Tarsorrhaphy for persistent epithelial defects in neurotrophic keratitis
- Often used in patients with prior keratitis that have impaired wound healing, also in combination with Tarsorrhaphy (temporary or permanent)

# Sutured Amniotic Membrane

## Surgical Technique



# Management of Corneal Neovascularization

## Common in Severe Ocular Surface Disease

- Mild Neovascularization
  - Control of underlying disease
  - Peripheral, not associated with lipid keratopathy
- Severe deep neovascularization
  - More often associated with severe disease
  - Prior transplant rejection
  - Zoster or Simplex
  - Ocular Rosacea uncontrolled in past



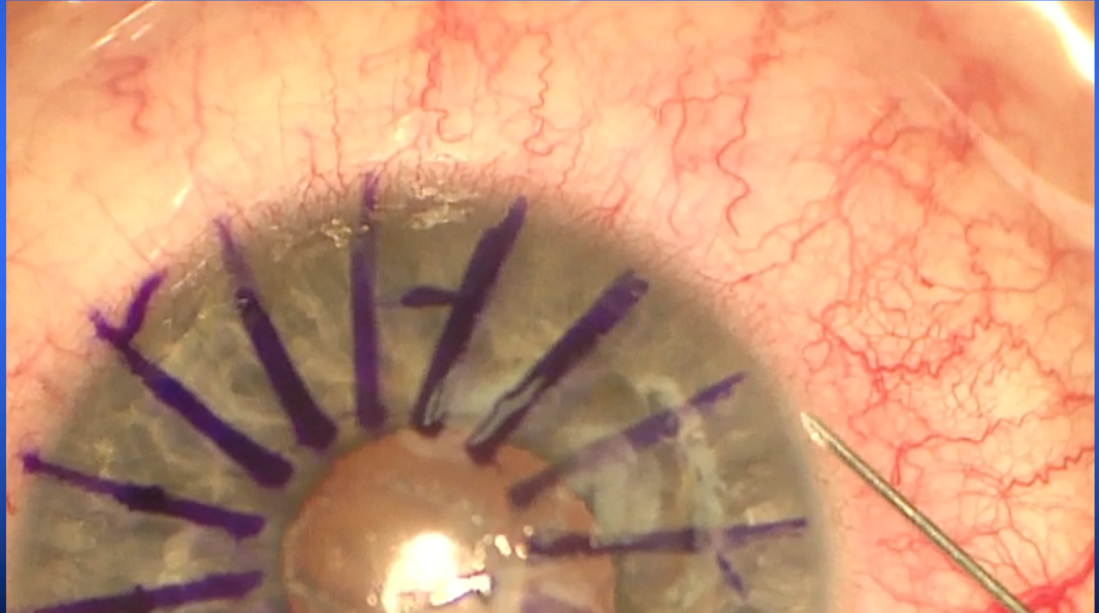
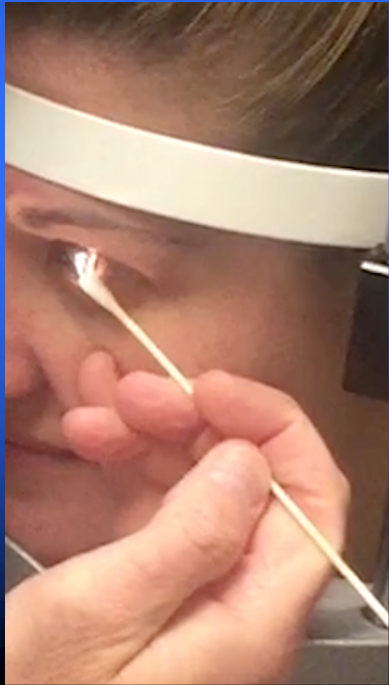
# Lipid Keratopathy

## Management

- Aggressive medical management of ocular surface disease
- VEGF inhibitors
  - Topical
  - Injections
    - Usually more practical for patients/cost-effective

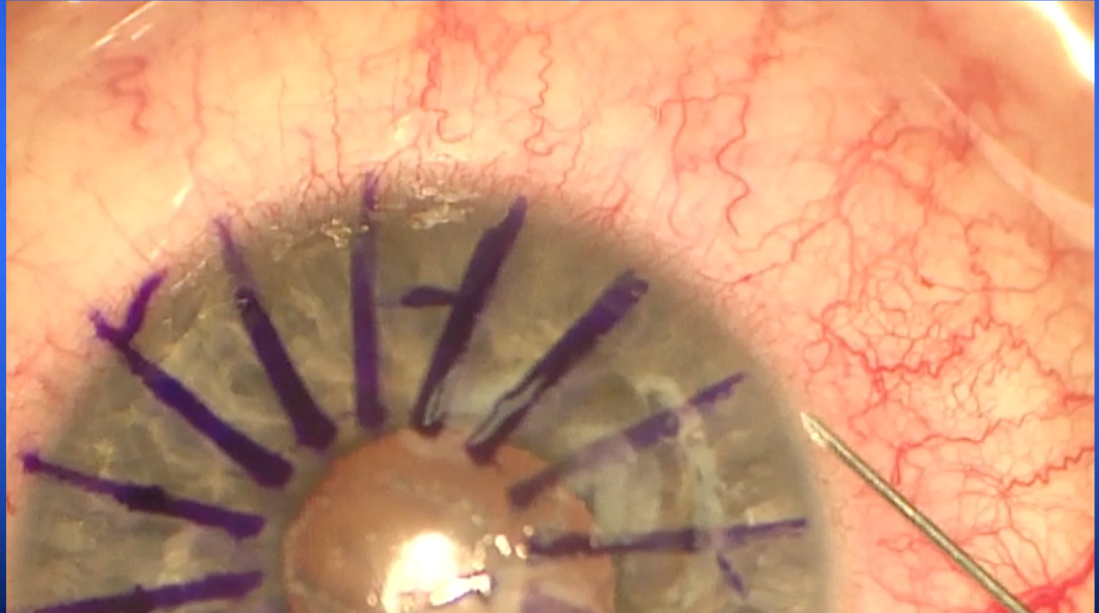
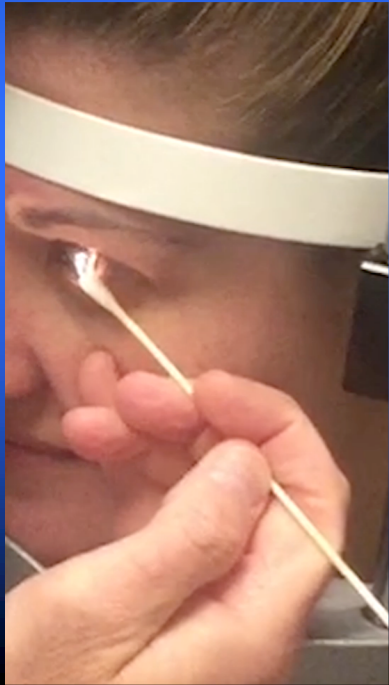
# VEGF Inhibitors

## Surgical Management



# VEGF Inhibitors

## Surgical Management



# Conjunctival Biopsy

## Suspicion of Cicatricial Pemphigoid

- Forniceal foreshortening
- Chronic conjunctival inflammation – autoimmune disease (F>M)
- Helpful to biopsy to confirm disease

Nonspecific nature of early disease leads to late diagnosis

Differential: Viral Conjunctivitis, chlamydia, bacterial, chemical, atopic, surgical or thermal scarring

Systemic immunosuppression associated with significant side effects

50% of patients have associated systemic disease

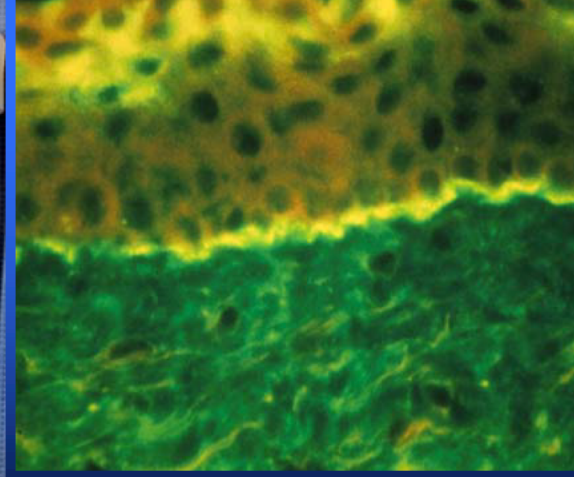
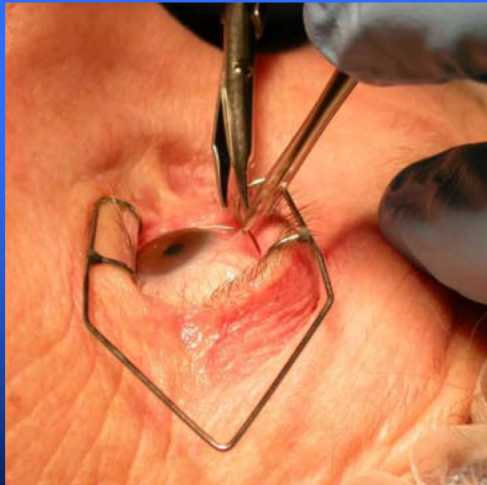
Biopsy shows linear deposition of IgG, IfA, C3 or C4 at Basement Membrane

Michel's medium and formalin usually (talk directly to pathologist)

# Conjunctival Biopsy

## Surgical Process

- 2-4mm – place in Michel's medium - try to keep orientation – main risk is stimulating more inflammation
- Superior conjunctiva preferred by many surgeons – many do buccal mucosa biopsy same time
- Linear IgG and IgA along basement membrane zone



# Management of Limbal Stem Cell Deficiency

## Surgical Management of Severe Ocular Surface Disease

- Early stages
  - Medical Management
  - Reduction in stem cell stress
    - Control underlying disease
    - Limit contact lens wear
- Moderate stages
  - 180 degrees or less of involvement
- Severe stages
  - Over 180 degrees of involvement

# Moderate Stem Cell Deficiency

## Superficial Keratectomy & Amniotic Membrane Grafting

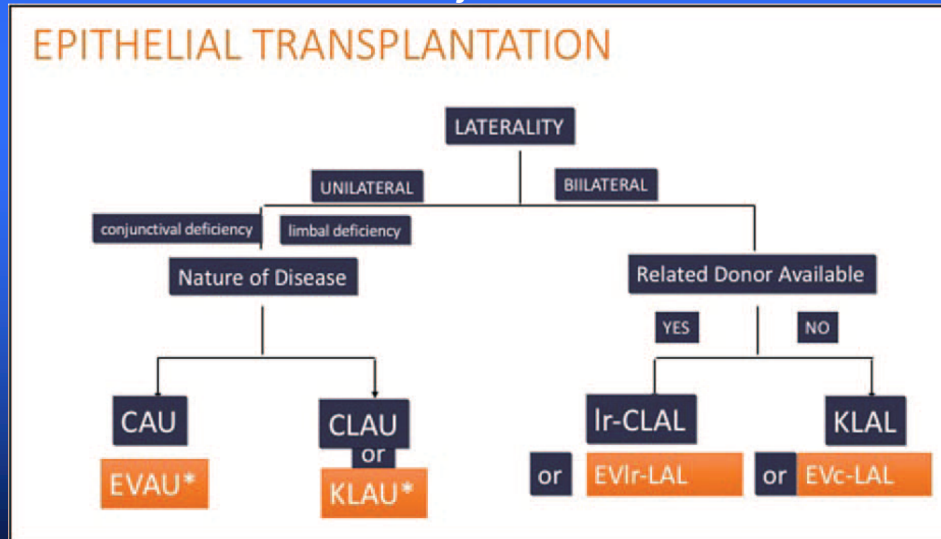
- Remove abnormal corneal epithelium in area of stem cell deficiency
- Remove any neovascularization in the area
- Sewn amniotic membrane
- Bandage contact lens
- Temporary and/or permanent tarsorrhaphy
- Postoperative steroid, antibiotic and lubricants
- NSAID for comfort – minimal as needed



# Severe Stem Cell Deficiency

## Limbal stem Cell Restoration

- Many procedures depending on exact situation
- Mixed diseases and not just ocular surface disease





# Salivary Gland Transplantation

## Surgical Management

- Has been reported, especially when not associated with systemic autoimmune disease
- Post-radiation
- Transplanting minor salivary glands into inferior tarsal conjunctiva or fornix
- Transplantation of portion of the submandibular salivary gland and duct into temporal fossa
- Technically complex
- Salivary glands have different consistency of the “tear” film

# Conjunctival Flap

## Surgical Management

- Typically reserved for the most severe cases where comfort is the main issue
- Requires enough conjunctiva to mobilize over the cornea
- Vision typically poor
- May be combined with Tarsorrhaphy and Punctal Occlusion

# Pterygium Removal

## Commonly Exacerbate Dry Eye Disease

- My preferred approach is:
  - Removal
  - Conjunctival transplant from superior
  - Superior Cautery Punctal Occlusion
  - Temporary Tarsorrhaphy
  - Amnion if unable to cover sclera with conjunctiva

# Summary

## Surgical Management of Severe Ocular Surface Disease

- Complex set of patients
- Usually managed by medical treatment and in-office meibomian gland and lid treatments
- Punctal occlusion helpful in many
- Conjunctivochalasis management may be helpful
- Rosacea can cause lipid keratopathy – consider VEGF drugs
- More severe cases:
  - Tarsorrhaphy
  - Amniotic membrane
  - Epithelial cell transplants
- Diagnostic biopsy if suspect Ocular Cicatricial Pemphigoid