

Dry Eye following Cataract and Refractive surgery

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This lecture is a part of two lectures sponsored by Allergan at Hotel Narmada Jackson on March 29 2009.

Causes

Surgical trauma

- Lack of lubrication
- Epithelial defects
- Suction ring pressure (LASIK)
- Lagophthalmos

Altered corneal curvature

- Altered anatomic relationship between lid and cornea

Inflammation

Exposure to medications/anesthetics

Trauma to sensory nerves

- Incisions, flap, photoablation
- Decreased corneal sensation

Dry Eye Symptoms in Relation to Common Cataract Surgeries

Deterioration in corneal sensitivity and tear physiology is seen immediately after phacoemulsification.

Induces greater and more prolonged damage to corneal sensation and corneal barrier function

Corneal sensitivity does not return to preoperative levels until 3 months

Causes prolonged increase in corneal epithelial permeability

Surgery results in decrease of tear film stability

Most corneal surgical procedures, including phacoemulsification, disrupt the normal organization of corneal innervation

Denervation of the cornea results in increased corneal sensitivity threshold causing:

- reduction in tear flow
- decrease in blinking frequency
- impaired wound healing & longer re-epithelialization period
- increased epithelial permeability
- decreased epithelial metabolic activity

Jordan & Baum reported a reduction in tear flow in anesthetized cornea

Beurman and Schimmelpfennig observed a decrease in blinking frequency in eyes with denervated cornea

Affects 2 other protective mechanisms

- A marked reduction in mitosis rate in denervated corneal epithelial tissue
 - A clear reduction in epithelial wound healing & longer re-epithelialization period of denervated cornea
- In addition, a reduction in corneal metabolism & increased permeability of corneal epithelium were also observed

Changes in tear film and tear secretion

Cataract surgery results in alteration of tear physiology resulting in decreased lacrimal production.

Cataract surgery may results in damage to innervations to lacrimal gland, conjunctiva, lacrimal gland and goblet cells.

Conjunctival damage caused by suction ring application may cause dry eye symptoms

Significantly lower tear film break-up time (TBUT) is observed following cataract surgery.

Van Bijsterveld score increases after Cataract Surgery

Van Bijsterveld score represents the severity of dry eye symptoms and damage to eye

Cornea and conjunctiva fluorescein staining is positive in patients who underwent cataract surgery

Fluorescein staining spots on cornea and conjunctiva is seen after cataract surgery.

During wound healing difference in the wound healing response between superficial vs. deeper stromal wound models might result from interference of neural systems resulting in dry eye symptoms

Lubrication is highly important to wound healing and the prevention of haze after refractive surgery.

Thus, dry eye may delay wound healing after cataract surgery

Impact of dry eye following cataract surgery

Dry eye can cause Weakened protective function, patients can feel more sensitive to environmental factors

Severe dry eye can affect patients' social function, mental function, and even their confidence.

Delayed wound healing

Treatment

1. Symptomatic Treatment . Tear substitutes which do not produce toxicity or discomfort are the main stay for treatment.. Preservatives are potent irritant .Without preservatives the drops may not be safe after 24 to 48 hours. Ideal is a single application capsules ..
2. Protection from dry wind, sun light, and ,toxic and industrial fumes and smokes are all risk factors and need to be excluded. Cigarette smoke is considered to be a positive irritant.
3. Improvement of lid hygiene can produce dramatic improvement in dry eye symptoms

.Application of mild steroid-antibiotic ointment on the lid margin is effective. Excessive meibomian secretions that cling to the lashes must be removed.

4. Localized lid, conjunctival, and corneal abnormalities that create a disruption of the tear film should be treated. Trichiasis and verrucae on the lid border may produce local defects in the tear film and impair the tear surfacing function of the lids.
5. steroid ointment applied after lid treatments reduce inflammation and increase acceptance of the hygienic methods required to eliminate excessive meibomian secretions. Systemic tetracycline may control lipid abnormalities of the lids and tear film.

Artificial tears

Artificial tears - main stay of treatment . Preservative are the problems . can cause toxic reaction.. Non preservative drops are liable to be contaminated in 24 to 48 hours of opening .Even acanthamoeba and Pseudomonas have been traced in 72 hours. Single use applicaps are an important development.

Ointments

Ointment.. with a petrolatum base prevents dryness of the eyes. The ointment may acts as a foreign body due to drying and produces irritation rather than relief. Moreover sensitivity to preservatives may be more of a problem with ointments than with solutions..

Inserts

Polymer inserts without preservatives have been developed . slowly dissolve in the presence of adequate moisture these inserts provide a continuous release of polymer covers the tear film and prevents evaporation.

Autologus Serum

blood is removed from the Pt. and his/her own serum is used as eye drop. Pts with “No reflex tearing” dry eye are particularly responsive to this therapy.

Contact lenses

Contact lens wear by patients with dry eyes is risky and can cause severe problems,’ and *there is no place for the use of contact lenses alone for the treatment of dry eyes*. Concomitant use of artificial tear drops and frequent check-ups are essential.

Parotid duct transplant

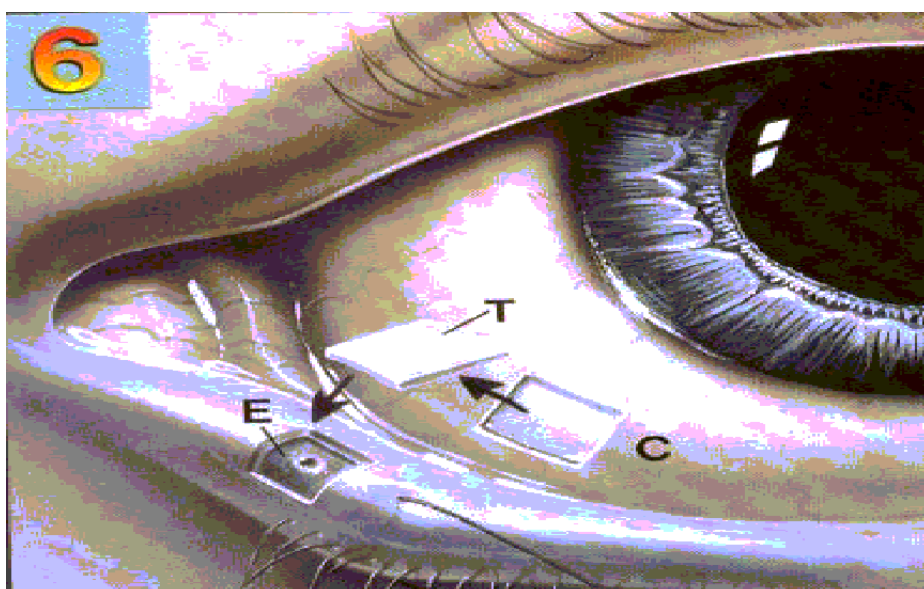
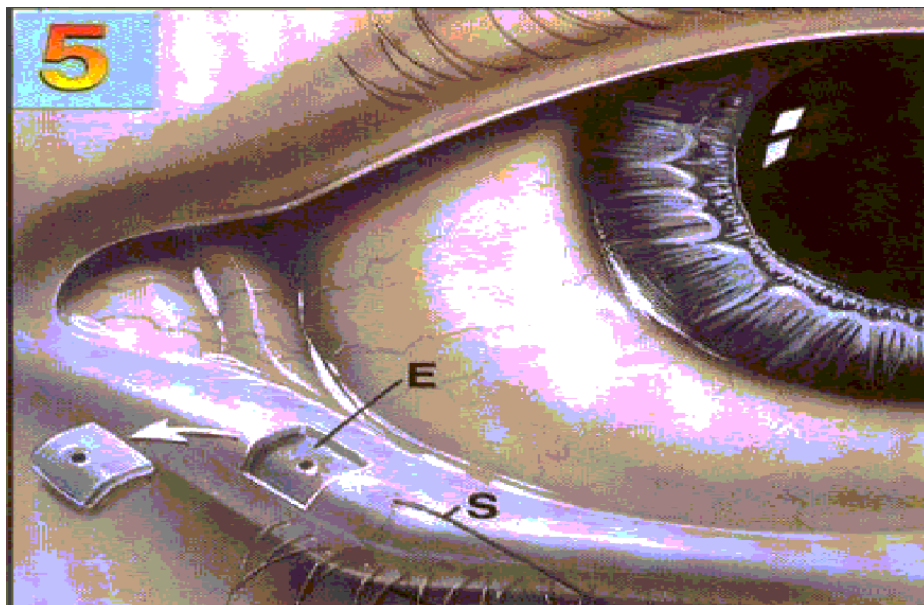
Several attempts have been made to relieve dry eyes by translocating the parotid duct to the inferior cul-de-sac, In spite of considerable chemical differences between parotid gland secretions and tears, the moisture provided prevents drying.

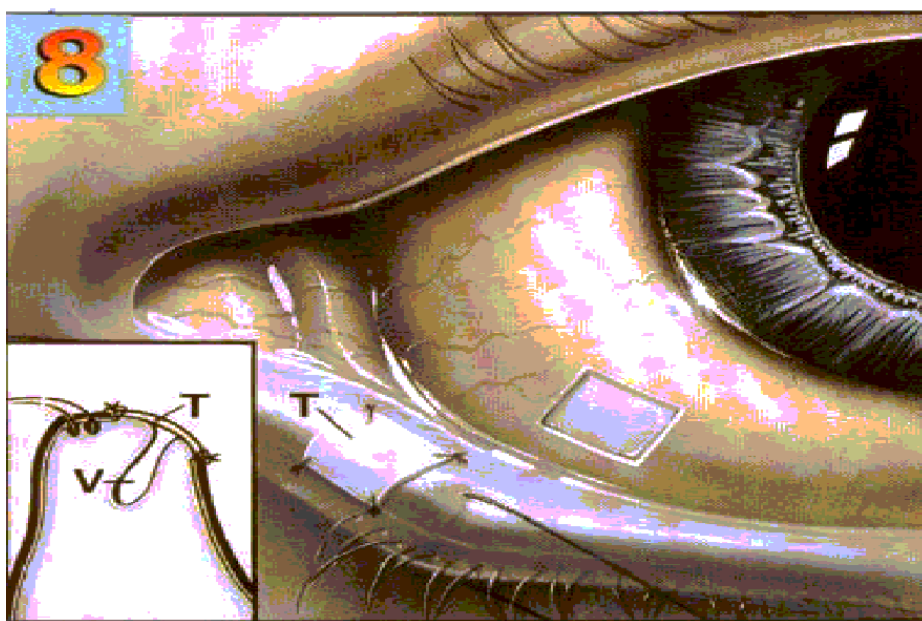
In Sjogren’s syndrome the salivary glands as well as the lacrimal glands are simultaneously affected but recent studies have shown, that the two may not be affected to the same extant. Therefore, translocation of the salivary duct may be worth reconsidering in view of this new information.

Punctal occlusion

Occlusion of the lacrimal puncta prevents tear drainage and frequently improves dry eye symptoms. Inserts, cauterization ,ligation and tissue adhesion and surgical excision have all been tired.

Punctal patch technique





Artificial tear pumps

Small Battery-powered infusion pumps developed to treat severe dry eyes.”A similar device delivers artificial tears to the lower cul-de-sac through an implanted tube that enters at the patient’s ear and comes through the lower lid.” They are cumbersome and get contaminated

Special Spectacles for Dry eye



The spectacles have side panels and moist inserts. from which water steadily evaporates are attached to special side panels of modified eyeglasses. Steady water evaporation from these sponges increase the moisture level in front of the eyes.