OCULAR SURFACE DISEASE

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Ocular Surface System

The Ocular Surface System includes:

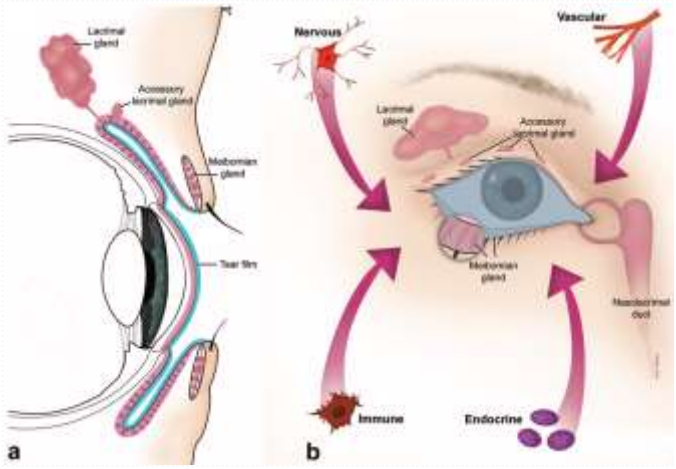
-The surface and glandular epithelia of the cornea, conjunctiva, lacrimal (connective tissue) matrices.

-The eyelashes with their associated glands of Moll and Zeis, those components of the eyelids responsible for the blink.

-The nasolacrimal duct.

Ocular Surface System

All components of the system are linked functionally by continuity of the epithelia, by innervation, and by the endocrine, vascular and immune systems.



Ocular Surface System

The function of the Ocular Surface System is maintenance and protection of the smooth refractive surface of the cornea.

Aetiology of Ocular Surface Disease

Aetiology of Ocular Surface Disease

Included among ocular surface diseases are the following:

- Aqueous-deficient dry eye associated with the Sjögren's syndrome.

- Non-Sjögren's aqueous deficiency (e.g., age-related).

Aetiology of Ocular Surface Disease

- Blepharitis.

a- Anterior (lash and lid associated).

b- **Posterior (lid margin and meibomian gland associated).**

- Contact lens-related evaporative tear disruption.

Aetiology of Ocular Surface Disease

- **Blink and lid anatomy abnormalities.**
- **Situational and environmental evaporative tear loss.**
- **Conjunctivochalasis (redundant bulbar conjunctival tissue).**
- **Allergic, chronic infective, and non-infective conjunctivitis and keratoconjunctivitis.**
- **Post refractive-surgery disruptions of the ocular surface**.

Classification of Ocular Surface Disease

Classification of Ocular Surface Disease

Two major types of ocular surface failure have been identified

-Type I

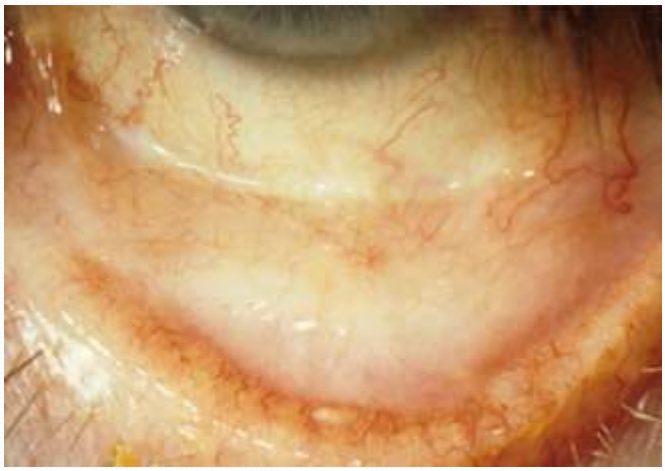
The first type of surface failure shows pathologic transition of normal non-keratinized ocular surface epithelia into keratinized epithelia (squamous metaplasia)

Classification of Ocular Surface Disease

- For conjunctiva squamous metaplasia is preceded with loss of goblet cells.

-The loss of goblet cells and mucin expression are accompanied by a switch to epidermal keratins.

Cicatrising conjunctival changes (subepithelial fibrosis of the tarsal conjunctiva and forniceal shortening



Classification of Ocular Surface Disease

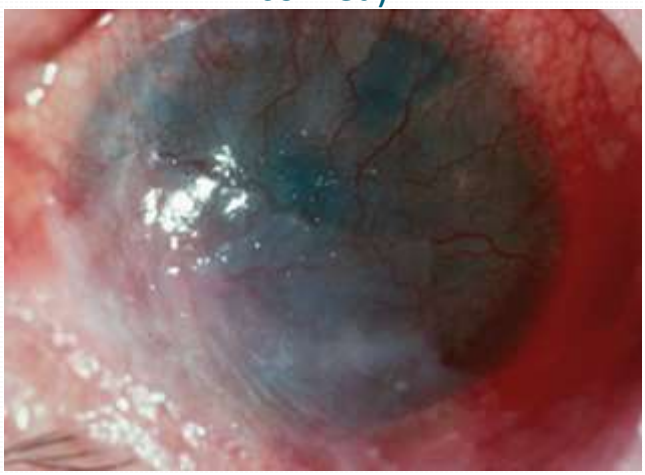
-Type II

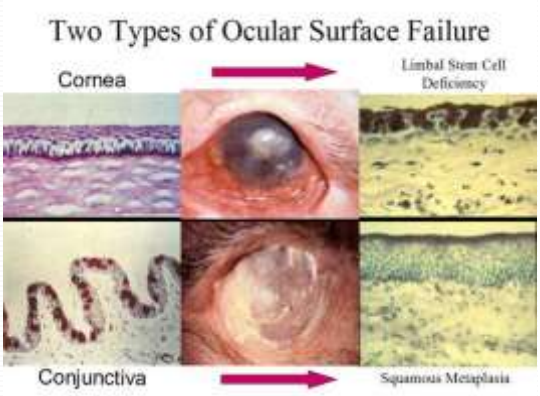
The second type of ocular surface failure is characterised by the replacement of the normal corneal epithelial phenotype with an invaded conjunctival epithelium in a process termed limbal (stem cell) deficiency.

Classification of Ocular Surface Disease

The hallmark of limbal stem cell deficiency is "conjunctivalization", which is best detected by Impression cytology.

Ocular surface failure (conjunctivalisation, opacification and vascularisation of the cornea)





Medical Treatment

Medical Treatment

Patients with ocular surface disease could present with mild ocular irritation or with severe decrease in vision due to ocular surface keratinization or due to destruction of limbal or conjunctival epithelial stem cells.

Medical Treatment

The history taking, examination, and diagnostic testing should be directed to identifying type of surface failure: the type I and II.

Medical Treatment

Detailed history, careful clinical examination, and clinical and laboratory diagnostic testing would help in diagnosis of type of ocular surface failure, to differentiate various types of dry eye syndromes, and distinguish delayed tear clearance from unstable tear film.

Medical Treatment

The dry eye or ocular surface disease is not a diagnosis in itself but represents an end result of variety of aetiologic mechanisms.

Management principles

Type 1

1. For each patient, diagnostic work-up should determine any intrinsic irritative stimuli derived from allergy, atopy, inflammation, toxic or infection, unstable tear film caused by aqueous tear deficiency and /or lipid tear deficiency, or delayed tear clearance.

Management principles

2. Treatment should be directed to the intrinsic irritative stimuli first especially if accompanied by delayed tear clearance even in the presence of unstable tear film.

3. Treatment of unstable tear film begins after the intrinsic irritative stimuli are eliminated.

4. For unstable tear film, ATD should be treated before LTD.

Management principles

Type II ocular surface (stem cell deficiency) failure is diagnosed by specific clinical features with cytologic evidence by impression cytology.

Management principles

When managing patients with an ocular surface condition, identifying the underlying disease is valuable.

However, diagnosis can sometimes be difficult or even impossible,as complex interactions exist between the different components of the ocular surface.

Management principles

In the absence of a definite diagnosis, ocular surface diseases can usually still be managed effectively, provided the choice of approach and therapy is based on the functional effects observed and their severity.

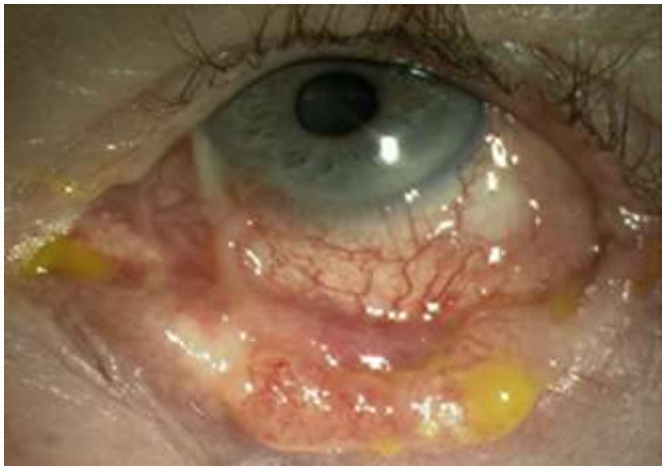
It is therefore important to have a systematic approach to the identification of functional effects and their severity.

Management principles

Ocular surface disorders often affect both eyes asymmetrically.

Where patients present with unilateral disease, neoplasia (e.g. ocular surface squamous neoplasia) must be excluded.

Ocular surface squamous neoplasia



Assessment of a patient with ocular surface disease

-Assess facial and periocular skin, eyelids, and conjunctival inflammation in normal light.
-Perform a slit lamp examination without eyelid manipulation to assess the lid margins and position, eyelashes, punctum, tear meniscus, and tear film quality.

Assessment of a patient with ocular surface disease

-Instil unpreserved dilute fluorescein into the tear meniscus (using a fluorescein strip wet with unpreserved saline)

-Wait one minute and assess tear film break-up time over 10 seconds. Look for focal areas of irregularity and break-up.

Assessment of a patient with ocular surface disease

-Assess for the presence of punctate stain on the cornea and conjunctiva, including the superior limbus.

-Assess the bulbar conjunctiva (for scarring, keratinisation, symblepharon), fornices, limbus, and cornea (for focal abnormal wetting, filaments, thinning, infiltrates, keratinisation, scarring and vascularisation.

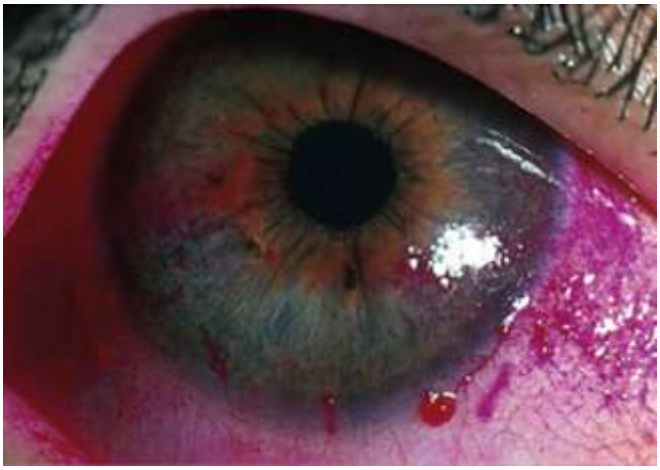
Assessment of a patient with ocular surface disease

-Evert the lids and assess the tarsal conjunctiva with white light and blue light for infiltrate, papillae, and follicles.
-Perform Schirmer's test for 5 minutes without anaesthesia.
-Test corneal sensation with cotton-tipped bud.

Assessment of a patient with ocular surface disease

-Press on lids and examine meibomian gland secretion.
-Instil lignocaine and fluorescein and use Lissamine Green (+/- Rose Bengal) if no surface stain is found with fluorescein.

Chronic punctate keratopathy with associated filaments (Rose Bengal stain)



Management

1-Eliminate exacerbating factors

Ocular surface irritants have a negative effect on the recovery of the ocular Surface.

A common example is the use of glaucoma drops on a continuous basis. If drops are needed, preservative-free formulations should be used where possible.

Eliminate exacerbating factors

-avoid using make-up and cosmetics on the eyelids and around the eye.

-Blepharitis is common and should be controlled to reduce its effects on tear film quality and the ocular surface

-Lid hygiene (lid cleaning) removes crusts, debris and bacteria load on the lid margins.

Eliminate exacerbating factors

-Warm compresses and lid massage mechanically unblocks meibomian glands in posterior lid margin disease.

-One- to three-month courses of tetracycline.

-Topical azithromycin.

Eliminate exacerbating factors

-Diseases of the eyelid and its adnexae(e.g. trichiasis, entropion) must be promptly addressed.

-Where appropriate,eyelid surgery should be considered.

2-Support ocular lubrication

-An overlying physiological tear fluid is essential for a healthy ocular surface.

-Supporting the tear film should be considered in all cases of ocular surface disease, especially if the eye is dry.

Support ocular lubrication

-Lubricants not only serve as tear substitutes, they also help to dilute ocular surface irritants and reduce the shearing forces of the eyelids on the corneal epithelium.

-Preservative-free lubricants are Preferable.

Support ocular lubrication

In aqueous-deficient dry eyes, punctal occlusion can prevent tear drainage and prolong the effects of tear substitutes.

Punctal occlusion may exacerbate symptoms of blepharitis, so this must be treated beforehand.

Permanent occlusion can be achieved by using punctal cautery.

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Support ocular lubrication

-Parasympathomimetics such as oral pilocarpine can also be useful if tolerated.

-In more severe disease, autologous serum is beneficial, but this is expensive.

3-Consider therapeutic contact lenses

-Therapeutic contact lenses (TCL) can be useful in severe dry eye diseases and persistent epithelial defects.
Rigid gas-permeable scleral TCL cover the cornea and most of the conjunctiva.
-This can prevent excessive tear evaporation and protects the ocular surface from abnormal lids.

4-Control ocular surface inflammation

-topical steroids
-Topical cyclosporin A (various preparations) has been shown to be effective in several ocular surface disorders without the adverse effects of steroids.

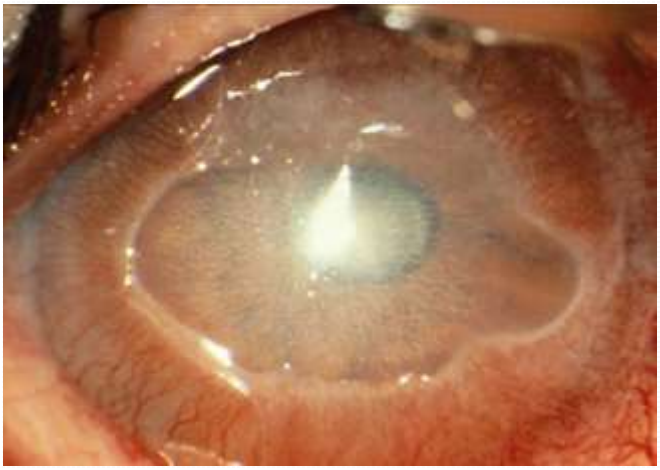
Control ocular surface inflammation

-Treatment of allergic eye disease
(including acute, seasonal and perennial
allergic conjunctivitis, vernal keratoconjunctivitis,
and atopic keratoconjunctivitis)
includes mast cell stabilisers and antihistamines

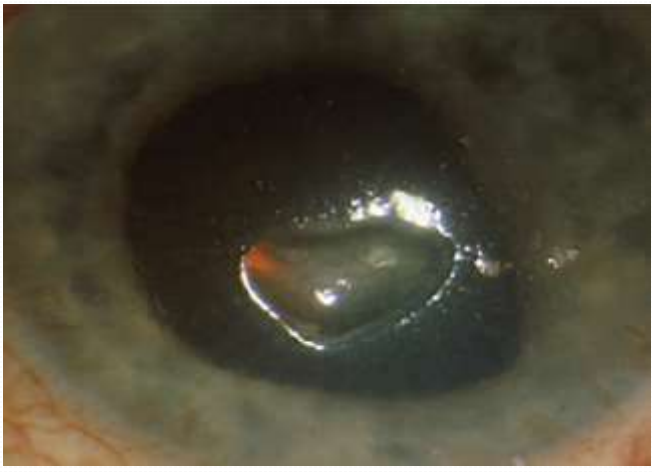
Control ocular surface inflammation

-In severe ocular surface inflammation
(e.g. corneal melts, mucous membrane
pemphigoid), rapid immunosuppression
is required to prevent visual loss.

Large persistent epithelial defect in avascularised cornea



Central corneal melt



5-Manage persistent corneal epithelial defects and microbial keratitis

-Management of persistent corneal epithelial defects is based on eliminating exacerbating factors, stimulating epithelialisation, improving epithelial stability, restoring the basement membrane, and renewing the epithelium.

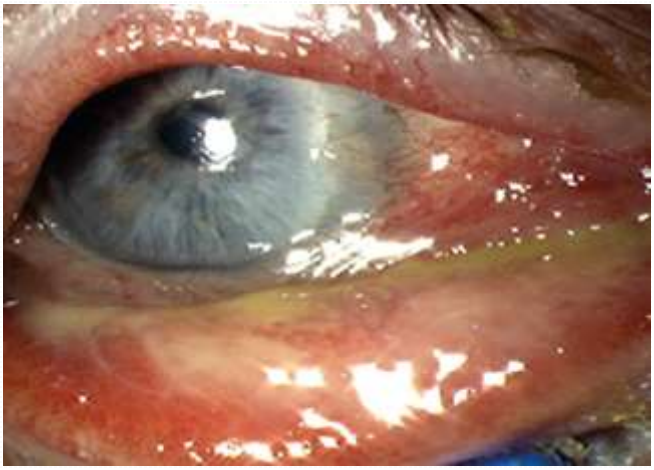
=Autologous serum and nerve growth factor treatments have both been shown to stimulate epithelialisation.

Manage persistent corneal epithelial defects and microbial keratitis

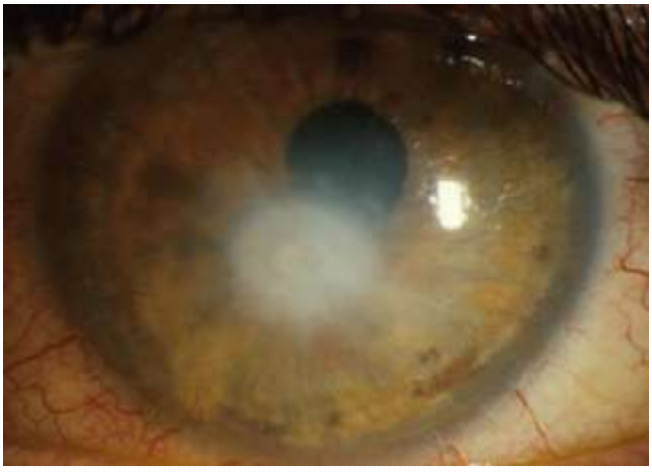
-Where infection is suspected, empirical treatment with a broad-spectrum antimicrobial should be initiated.

-Where fungal infection is suspected or diagnosed, steroid therapy must be discontinued and appropriate anti-fungal therapy commenced.

Bacterial conjunctivitis



Microbial keratitis caused by Candida species



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