Chronic Conjunctivitis

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Chronic conjunctivitis is one of the most common reasons that patients present to the office. Often times patients will seek multiple providers searching for a solution. The chronicity of their symptoms is extremely frustrating to the patient and treating physician alike. Some conditions can seriously affect vision and create ocular morbidity. Many of these diseases do not respond to commonly used topical antibiotics, topical steroids, artificial tears, and other treatments for external ocular disease. Our hope during this one-hour lecture is to present a process to help aid in the diagnosis of chronic conjunctivitis to help you determine the most likely etiology.

Classify Conjunctivitis into 4 Categories

1. Time course
2. Morphology
3. Localization of disease process
4. Type of discharge or exudate

Classification: Time Course

Three weeks is the dividing point as it is the upper limit for cases of viral infection and most bacterial infections to resolve without treatment.

- Acute Conjunctivitis
  - Conjunctivitis that has been present for less than 3 weeks
    - Adenoviral
    - Herpes Simplex
    - Inclusion (chlamydial) – if caught early
    - Newcastle disease (poultry handlers or veterinarians)
    - Enterovirus
    - Cat Scratch Fever

- Chronic Conjunctivitis
  - Conjunctivitis that has been present for greater than 3 weeks
Morphologic classification can be broken down into five categories:

- (1) Papillary
- (2) Giant papillary
- (3) Follicular
- (4) Membranous/pseudomembranous
- (5) Cicatrizig

All forms of conjunctivitis will have some form of Papillary hypertrophy.

Papillae are described as elevations of the conjunctiva with a central core blood vessel.

As the conjunctiva becomes thickened by infiltration with inflammatory cells, the individual papillae are created by septae that are fibrous connections of the epithelium to the underlying substantia propria.

Each papilla is then seen as a red dot, which represents the core blood vessel viewed on end.

Normally, visualization of individual papillae is difficult.

In papillary hypertrophy, the normal vascular pattern becomes obscured, and in extreme cases obliterated, by the inflammatory process.

When the individual septae separating papillae break down, multiple individual papillae merge to form a giant papilla.

Giant papillae are conjunctival elevations that are greater than 1 mm in size.

Most commonly occur on the upper tarsal conjunctiva, but in some cases can be seen on the lower tarsal conjunctiva.

They usually have flat tops and seem to fit together like cobblestones, hence the descriptive term "cobblestone papillae."
Membranes and pseudomembranes are sheets composed of a network of fibrin and inflammatory cells that form a layer over the surface of the conjunctiva. True membranes have a growth of capillaries from the conjunctiva into the membrane, while pseudomembranes are avascular. Either type of membrane is a sign of severe inflammation where the conjunctiva is very friable, and stripping either type of membrane causes bleeding.

Cicatrizizing

Some forms of conjunctivitis lead to progressive conjunctival scarring, or cicatrization. Findings associated with cicatrization include:
- stellate or linear subconjunctival scars
- shortening of the conjunctival fornices
- formation of symblepharon
- Eventually ankyloblepharon
- cicatricial entropion
- loss of conjunctival goblet cells leading to conjunctival and corneal keratinization
- Patients with pre-existent scarring are not immune to the causes of acute conjunctivitis
- Concurrency of scarring and inflammation is not enough to confirm a diagnosis of cicatrizing conjunctivitis; this diagnosis is made when chronic conjunctival inflammation is associated with progressive cicatrization

Classification: Anatomic Localization

Different forms of conjunctivitis tend to affect different areas of the external eye. Determining the predominant area of inflammation can contribute to making an accurate diagnosis. Some conditions have significant involvement of the eyelids as well as the conjunctiva:
- Chronic blepharitis
- Molluscum contagiosum
- Atopic keratoconjunctivitis
- Some primarily affect the upper palpebral conjunctiva
- Vernal keratoconjunctivitis (VKC)
- Trachoma
- Superior limbal keratoconjunctivitis (SLK)
Some primarily affect the lower palpebral conjunctiva
- Inclusion conjunctivitis
- Toxic conjunctivitis

Other entities involve the bulbar conjunctiva
- keratoconjunctivitis sicca

Many forms of chronic conjunctivitis have significant corneal involvement, termed Keratoconjunctivitis sicca.

Most forms of chronic conjunctivitis are bilateral, although often asymmetric.

Some are unilateral
- Lacrimal drainage infections
- Ocular surface tumors

As part of the inflammatory process, blood vessels have increased permeability, leading to leakage of serum, proteins, and inflammatory cells, creating an exudate.

Exudates can take different forms:
- Grossly purulent exudates are seen in hyperacute conjunctivitis.
- These are always acute diseases.
- Watery exudates are seen in viral infections.
- Always acute diseases.

The most common type of exudate is mucopurulent (or catarrhal), representing a mixture of mucus and pus.

In some allergic conditions such as VKC, there can be a mucoid exudate, a thick, tenacious discharge that can be peeled intact off the conjunctival surface, often revealing a cast of the morphology of the conjunctival surface.

The major causes of chronic follicular conjunctivitis are:
- Chlamydial infection
- Toxic conjunctivitis from topical medications
- Molluscum contagiosum

Thoroughly examine the eyelids for molluscum lesions.

Take a detailed history of topical medication use that could lead to follicular conjunctivitis.

If none of above identified, there is a presumptive diagnosis of chlamydial infection.

confirmed with laboratory studies

or a therapeutic trial of an appropriate systemic antichlamydial antibiotic.

The most common cause of chronic follicular conjunctivitis is infection with the organism *Chlamydiae trachomatis*.

This infection takes two clinical forms:
- Trachoma
- Inclusion conjunctivitis
Trachoma
- Trachoma is the leading cause of corneal blindness in the world. It is highly endemic in many developing areas of the world.
- Prevalence of the disease related to poor sanitation:
  - Flies are believed to be an important vector for the spread of the disease.
- High level of morbidity is likely related to multiple recurrences of infection, as well as frequent concurrent bacterial superinfections.
- Trachoma causes a follicular conjunctivitis where the follicular response is predominant in the superior conjunctiva.
  - Superior pretarsal follicles can become as large as those seen in the conjunctival fornix, in which case they are termed "mature".
  - Follicles can also occur at the limbus; necrosis of limbal follicles leads to depressed limbal scars called "Herbert's pits", a finding that is pathognomonic for trachoma.
  - A vascular pannus most marked along the superior limbus is frequently seen. With progression of the disease, trachoma is a cicatrising as well as a follicular conjunctivitis, with development of linear subepithelial scarring affecting the pretarsal conjunctiva.
- A dense linear scar superior to the upper lid margin is called an "Arlt’s line".
  - Conjunctival scarring causes cicatricial entropion and trichiasis, which leads to the corneal scarring that can result in blindness.

Inclusion Conjunctivitis
- Inclusion conjunctivitis is the most common form of ocular chlamydial infection in the developed world.
- It is a sexually transmitted disease.
- C. trachomatis is the most prevalent cause of non-specific urethritis in men and cervicitis in women and reaches the eye by genital-ocular transmission.
- While inclusion conjunctivitis can sometimes be diagnosed during the acute stage (<3 weeks duration), non-treated or inadequately treated infections will persist well longer than 3 weeks.
- Symptoms include redness of the eye and a mucopurulent discharge.
- Clinical findings are those of a follicular conjunctivitis, with the lower palpebral conjunctiva being most severely affected on exam (the upper fornical conjunctiva is likewise affected, but is not visible on examination without double-eversion of the upper eyelid).
  - Follicles in the bulbar conjunctiva and semilunar fold are frequently present. Follicles in chlamydial infection are significantly larger than those seen in viral conjunctivitis. Follicles do occur on the upper tarsal conjunctiva, but they appear as slightly elevated whitish lesions, never becoming mature as in trachoma.
  - A small, nontender preauricular lymph node is usually palpable in all forms of chronic follicular conjunctivitis.
  - Subepithelial corneal infiltrates are often seen, but they tend to be more peripheral and less diffuse than those seen in epidemic keratoconjunctivitis (EKC).
  - Diagnosis of trachoma and inclusion conjunctivitis is usually made based on clinical findings. Inclusion conjunctivitis gets its name from the basophilic inclusions, capping the epithelial cell nucleus seen on Giemsa-stained conjunctival scrapings, which can be seen with either form of chlamydial infection. More important than identification of inclusions, however, is the predominant type of inflammatory cell, as chlamydial infection is the only form of chronic follicular conjunctivitis where PMNs predominate.
Diagnosis of trachoma and inclusion conjunctivitis is usually made based on clinical findings.

Inclusion conjunctivitis gets its name from the basophilic inclusions capping the epithelial cell nucleus seen on Giemsa-stained conjunctival scrapings. Chlamydial infection is the only form of chronic follicular conjunctivitis where PMNs predominate. The diagnosis can be confirmed by chlamydial culture, direct fluorescent antibody staining, or PCR techniques.

Neither form of adult chlamydial infection responds to topical antibiotics. Inclusion conjunctivitis is a systemic disease and the genital infection must be treated as well:
- Azithromycin 1 gram single dose
- Doxycycline 100 mg bid for 7 days
- Tetracycline 250 mg qid for 7 days
- Erythromycin 500 mg qid for 7 days

Treatment of regular sexual contacts is important to prevent recurrent infection. Periodic mass administration of antichlamydial antibiotics in endemic areas can reduce the overall morbidity of trachoma in treated communities.

Caused by the molluscum contagiosum virus, lesions are waxy, elevated cutaneous nodules that frequently have an umbilicated center. Often found on or near the eyelid margin, these lesions are presumably related to the toxic effect of viral particles spilling onto the conjunctiva. In HIV-infected patients they can be numerous and diffuse. Lesions do not respond to topical medications. Definitive treatment is removal of the offending lesion(s), either by excision or curettage.

Chronic follicular conjunctivitis can be the result of a toxic reaction to a wide variety of topical medications. Symptoms and physical findings are identical to inclusion conjunctivitis. Laboratory studies, however, are negative for chlamydial organisms. In contrast to chlamydial infection, where polymorphonuclear leukocytes (PMNs) are the predominant inflammatory cell, conjunctival scrapings predominantly reveal lymphocytes. This diagnosis is made by having a high index of suspicion, in identifying a medication that is the likely cause, and observing resolution of the conjunctivitis after discontinuing the medication.
Toxic Follicular Conjunctivitis

- Medications Causing Toxic Follicular Conjunctivitis:
  - Antiviral: idoxuridine, vidarabine, trifluridine
  - Glaucoma: pilocarpine, carbachol, echothiophate, epinephrine, dipivefrin, apraclonidine, latanoprost
  - Antibiotics: gentamicin, neomycin, sulfonamides, amphotericin b
  - Other: neostigmine, physostigmine, atropine, scopolamine

- Various cosmetics can cause toxic follicular conjunctivitis

Giant Papillary Conjunctivitis

- Giant papillary conjunctivitis (GPC) occurs in primary and secondary forms
- All forms of GPC are at least partially caused by chronic ocular allergy
- Primary forms of GPC include
  - Vernal keratoconjunctivitis (VKC)
  - Atopic keratoconjunctivitis (AKC)
- Secondary GPC include
  - Contact lenses
  - Ocular prosthesis
  - Exposed sutures

Vernal Keratoconjunctivitis

- VKC is a chronic allergic conjunctivitis affecting children and young adults, generally between the ages of 6 and 18
  - Male > Female
- Patients often have concurrent allergic diseases such as seasonal allergies and asthma
- The predominant symptom is ocular itching, as well as redness, mild photophobia, and a thick mucoid discharge
- There is often a seasonal variation in symptoms with the spring and early summer being the worst period, hence the name “vernal” (springtime) keratoconjunctivitis

Palpebral form
- Most common
- Predominantly affects the upper palpebral conjunctiva primarily affecting the inner facial conjunctiva
- The lower palpebral conjunctiva demonstrates a fine papillary response
- The entire conjunctiva has a pale “milky” appearance that projects like a secondary papillae, unlike the deep red seen in acute forms of conjunctivitis
- A thick, tenacious mucoid discharge is often present
- eyelid laxitylig.
Limbal form
- Fine milky papillary response without formation of giant papillae
- Gelatinous limbal papillae associated with epithelial infiltrates called Horner-Trantas dots, which are focal collections of eosinophils
- More prevalent in African American children

In either form
- There is commonly a superior punctate keratopathy
- Punctate lesions can coalesce into a sterile shield-shaped ulcer ("vernal ulcer") centered at the junction of the middle and upper third of the cornea

Atopic Keratoconjunctivitis
- AKC has different demographic characteristics
  - Patients suffer from atopic eczema from early childhood, but are free of ocular symptoms until early adulthood
  - Male > Female
  - Older adults
  - Generally have eczema affecting the eyelids as well as other areas of the body
- Ocular symptoms include itching, redness, and a mucoid discharge
- Conjunctival involvement is characterized by papillary hypertrophy ranging from fine to giant papillae
- While the upper tarsal conjunctiva predominates, the lower palpebral conjunctiva is more affected than in VKC
- Giant papillae can sometimes be seen in the inferior conjunctiva, which never occurs in VKC

Atopic Keratoconjunctivitis
- Thickening of the limbal conjunctiva is common
- Conjunctival scarring often occurs from prolonged inflammation, resulting in symblepharon formation
- Due to longer duration of the disease, corneal involvement is more common in AKC than VKC, characterized by a superficial epitheliopathy eventually leading to vascularization and scarring
- AKC patients are prone to early development of cataracts, have a higher incidence of retinal detachment, and often suffer more severe corneal infection with herpes simplex virus
- Cicatricial ectropion may also occur due to prolonged eczematous skin changes

Vernal Keratoconjunctivitis

Vernal Keratoconjunctivitis

VKC / AKC Treatment
- Histamine release from mast cells plays a major role in the pathogenesis of both diseases.
- Topical mast cell stabilizers are mainstay of Tx
  - Cromolyn sodium
  - Nedocromil sodium
- Topical antihistamines and "antihistamines with mast cell stabilizing properties" are generally too weak for these diseases
- Topical steroids are highly effective for short bursts only
- Supratarsal injections of triamcinolone acetonide (Kenalog) are effective for acute flares of the disease
- Topical cyclosporine has also proven to be effective for long-term treatment in recalcitrant cases
- Dermatologic preparation of tacrolimus (Protopic) also effective
- Amniotic membrane therapy
- Where staphylococcal exotoxin contributes to the punctate keratopathy, periodic local treatment with antimicrobial antibiotics are useful

Secondary Forms of GPC
- Symptoms include redness, heaviness and swelling of the lids, and a mucopurulent discharge
- Decreasing lens tolerance in CL wear is usually the initial symptom
- This diagnosis is made by observing giant papillae on the upper pretarsal conjunctiva
  - Not as large as those seen in primary forms of GPC
Secondary Forms of GPC

- Prosthesis-related GPC often responds to more frequent removal, cleaning, and polishing of the prosthesis.
- Chronic treatment with mast cell inhibitors can suppress the disease for the long term.
- Contact lens-related GPC responds to:
  - a period of stopping lens wear, followed by re-institution of lenses using a different lens material
  - more frequent removal and cleaning
  - increasing the frequency of lens replacement (daily disposable lenses are extremely useful for this indication)
  - suppressive treatment with mast cell stabilizers.

Chronic Membranous Conjunctivitis

- Membranes and pseudomembranes are usually signs of severe, acute inflammation.
- Chronic forms of membranous conjunctivitis are rare.
- Ligneous conjunctivitis is the only chronic membranous conjunctivitis.
- The disease is characterized by thick membranes, sometimes called ligneous lesions.
  - Referring to the "woody" texture of the membranes.
- Affects individuals of all ages (infancy to elder years).
  - Median between 3 and 5 years.
  - Slight female preponderance.
- It can affect one or both eyes and any area of the conjunctiva.
  - Palpebral conjunctiva most commonly involved.
- Believed to be a manifestation of type I hypoplasminogenemia.
- Membranes can be found in tympanic membrane, upper and lower respiratory tract, renal collecting system, and female genital tract.

Chronic Cicatrizig Conjunctivitis

- Some forms of chronic conjunctivitis lead to progressive scarring.
- Cicatrizig conjunctivitis.
- Symptoms include:
  - redness, irritation, foreign body sensation, and a discharge.
- In addition to a papillary response, signs of conjunctival scarring are observed.
- The earliest finding is shortening of the conjunctival fornices.
  - More easily observed with a penlight exam.
Chronic Cicatrising Conjunctivitis

- Stellate and linear subepithelial scarring can be seen involving the palpebral conjunctiva.
- With more advance disease, symblephara develop that can lead to ankyloblepharon.
- Conjunctival scarring can cause cicatrical entropion and trichiasis.

Chronic Cicatrising Conjunctivitis

- Corneal involvement includes vascularization, epithelial staining, persistent epithelial defects, and scarring as the result of loss of limbal stem cells.
- All forms of cicatrising conjunctivitis cause a mucin-deficient dry eye, characterized by rapid break-up of the tear film.
- Treatment of the underlying disease is the most effective form of treatment.
  - Most commonly using anti-inflammatory Immunosuppressive agents.

Unilateral Chronic Papillary Conjunctivitis

- A small number of conditions cause chronic papillary conjunctivitis (CPC) that is more typically unilateral than bilateral.
  - These include:
    - Lacrimal drainage infections
      - Chronic dacryocystitis
    - Canaliculitis
    - Giant fornix syndrome
    - Masquerade syndrome due to a tumor
      - Most commonly sebaceous carcinoma
    - Factitious conjunctivitis

Lacrimal Drainage Infections

- Patients who present with a unilateral chronic or recurrent conjunctivitis, limited to one eye, should first have a thorough exploration of their lacrimal drainage system.
- Symptoms of chronic epiphora, a larger-than-normal tear meniscus, and prolonged retention of fluorescein dye strongly suggest lacrimal drainage obstruction.
- Swelling of the canalicular region of the eyelid along with the appearance of a “pouting punctum” suggest canaliculitis.

Lacrimal Drainage Infections

- In nasolacrimal duct obstruction and chronic dacryocystitis, digital massage over the lacrimal sac, or lacrimal irrigation, will usually produce reflux of fluid along with purulent discharge.
Chronic Dacryocystitis

- Presents as a chronic or recurrent conjunctivitis
- Usually limited to one eye, although bilateral cases do occur
- Complain of:
  - Epiphora
  - Chronic mucopurulent discharge
  - Redness of the eye
  - Sticking together of the lashes in the morning
- Diffuse papillary response and mucopurulent discharge
- Swelling of the medial canthal region overlying the lacrimal sac
- Not tender or acutely inflamed
- Some patients will give a history of chronic sinus disease or facial trauma
- Elderly women, have progressive essential dacryostenosis

Intermittent obstruction can be caused by a dacryolith
- Chronic infection in the lacrimal sac occurs as the result of stagnation of tears that cannot progress past the obstruction
- Retrograde drainage of purulent material into the eye causes the conjunctivitis. A definitive diagnosis is made when purulent material refluxes into the eye with pressure over the lacrimal sac, or with reflux of saline and pus on attempted nasolacrimal irrigation
- Gram-positive organisms including Staphylococcus aureus, coagulase-negative staphylococci, and Streptococcus pneumoniae are found in approximately two-thirds of cases
- Gram-negative bacteria, most commonly Pseudomonas aeruginosa, are found in approximately 25%
- While topical or systemic antibiotic treatment may provide temporary relief of symptoms, without relief of the obstruction, the infection always recurs
- A dacryocystorhinostomy is curative

Canaliculitis

- This condition occurs because of a diverticulum of the canaliculus
- With stasis of fluid within the diverticulum leading to secondary infection
- No epiphora
- No delay of fluorescein drainage
- No elevated tear meniscus
- Patients complain of symptoms similar to bacterial conjunctivitis and demonstrate papillary conjunctivitis with a mucopurulent discharge
- The disease should be suspected when there is inflammation and swelling along the lid margin medial to the punctum.
- Use the normal opposite side for comparison
- The diagnosis is confirmed by expression of the canaliculus
- After the eye has been anesthetized the area of swelling is squeezed between two cotton-tipped applicators
- Roll both dives toward the punctum
- Delivery of a granular, cheesy material from the punctum establishes the diagnosis
- Canaliculitis concretions are found in more than 70% of patients.

Caused by a variety of organisms
- Streptococci
- Staphylococci
- Actinomyces species
- Anaerobic filamentous bacteria
- Complete expression followed by irrigation with penicillin or another antibiotic solution can be curative
- In recalcitrant cases, the diverticulum must be obliterated to achieve a cure

Giant Fornix Syndrome

- Chronic or recurrent mucopurulent conjunctivitis
- Deeper-than-normal superior conjunctival fornices
- Related to upper lid ptosis from dehiscence of the levator aponeurosis
- Elderly in their eighth to tenth decade
- Majority are female
- Typically unilateral
- Consistent finding is a coagulum of mucopurulent material in the recesses of a large upper fornix
- S aureus positive
- Concomitant nasolacrimal duct obstruction and chronic dacryocystitis
- Diagnosis often delayed
- Average duration of symptoms of 2 years
Giant Fornix Syndrome
- Corneal complications, including punctate epitheliopathy, vascularization, scarring, persistent epithelial defects, chronic corneal ulceration, and perforation, are common
- Short course topical antibiotics only give temporary improvement.
- Treatment strategies include the prolonged use of systemic anti-staphylococcal antibiotics, and intensive topical antibiotics and corticosteroids
- Supratarsal injections of antibiotics and steroids, along with irrigation and sweeping of the fornix with povidone-iodine solution, have been advocated
- Conjunctival cultures helpful to rule out MRSA and direct treatment
- Surgical correction of the ptosis may play a role in management

Masquerade Syndrome
- Chronic unilateral conjunctivitis caused by a malignant tumor involving the conjunctiva
  - The most common is sebaceous carcinoma of the eyelid
    - Sebaceous carcinoma usually arises in the meibomian gland
    - Can also arise in the glands of Zeis or from sebaceous tissue in the caruncle.
    - Occurs more commonly in women
    - Upper lid is involved more frequently than the lower lid
    - Peak age is the fifth to eighth decade

Masquerade Syndrome
- The primary lid tumor can be occult
- The tumor has a predilection for intraepithelial spread through the conjunctiva
  - “Pagetoid spread”
  - Mimics inflamed conjunctival tissue or causes secondary inflammation
- In cases of unexplained chronic unilateral conjunctivitis
  - Focal areas of conjunctival thickening or nodularity should be biopsied
  - If the lesion is found to be malignant, appropriate treatment, whether surgical, radiation, or chemotherapy, is necessary to cure the conjunctivitis

Factitious Conjunctivitis
- “Red flags” that might indicate the possibility of factitious conjunctivitis include
  - Unrealistic history
  - Noncompliance with medication regimens
  - Seeming indifference to the severity of the disease
  - Failure to respond to what should be effective treatment
  - Focal, rather than diffuse disease
  - Unusual patterns of conjunctival staining
    - Infero-nasal quadrant is most commonly involved, presumably because this is the easiest location for the patient to access
  - Ultimately, treatment is psychiatric, but requires identifying the nature of the problem and confronting the patient with the diagnosis

Factitious Conjunctivitis
- Result of self-inflicted disease
  - Occurs when individuals gain some psychological benefit
    - A more tangible gain
  - While factitious disease can be bilateral, as much secondary gain can usually be derived from unilateral disease, so there is usually little reason for the patient to involve the second eye
  - Making a diagnosis of factitious conjunctivitis requires a very high index of suspicion
  - Affected individuals tend to be very good at denying their role in the disease and hiding their method of producing conjunctival inflammation

Factitious Conjunctivitis
- Mucus fishing syndrome
  - Have an underlying cause for chronic ocular surface inflammation, most commonly keratoconjunctivitis sicca, chronic blepharitis, or ocular allergy, causing a chronic ocular discharge.
  - Affected patients try to mechanically remove the discharge, either with their fingers or a cotton applicator, causing conjunctival trauma.
  - The resulting traumatic conjunctivitis further increases the amount of discharge, creating a vicious cycle.
  - An almost universal finding is conjunctival staining in the inferonasal quadrant of the bulbar conjunctiva, presumably because that is the easiest site to try to remove the discharge from the eye.
  - These patients readily admit the problem when they are advised of the likely pathogenesis.
  - Treatment is directed at the underlying condition, with the admonition to avoid manipulation of the eye
A number of causes of chronic conjunctivitis predominantly affect the upper tarsal conjunctiva and upper fornix:
- Floppy eyelid syndrome
- Superior limbic keratoconjunctivitis (SLK)
- Occult foreign body
- Masquerade syndromes caused by sebaceous carcinoma more commonly occur on the upper lid

Floppy eyelid syndrome is a disease that primarily affects middle-aged obese men. A papillary reaction is seen on the upper tarsal conjunctiva, and there can be a mucopurulent discharge. Generally, a punctate keratopathy is present. The unique feature of this disease is a hyperelastic, malleable tarsal plate. The tarsus is easily folded, and the lid is easily everted by gentle traction on the lid in a superior and lateral direction. Eyelash ptosis should alert the clinician to investigate further.

Chronic conjunctivitis that has unique characteristics:
- Middle-aged women
- Unilateral or bilateral (asymmetric)
- Symptoms include chronic redness, foreign body sensation, photophobia, and a scant discharge
- One-third of affected patients have a history of thyroid disease
- Hyperthyroidism
- 25% have dry eye
- Fine, “velvety” papillary response on the upper tarsal conjunctiva, with the lower conjunctiva spared

Superior limbic keratoconjunctivitis is hyperemic, with a leash of engorged blood vessels extending from the upper fornix to the limbus. The superior bulbar conjunctiva usually appears redundant with folds. Generally, a band, 2 mm to 4 mm wide, just above the limbus that stains confluent with rose bengal or lissamine green dye, and there is often a keratinised ridge at the upper limbus. occasionally a superior punctate or filamentary keratitis is present. The diagnosis of SLK is based on the clinical findings. No laboratory tests to support the diagnosis.
**Superior Limbic Keratoconjunctivitis**

- Unknown etiology
  - Theory is the chronic trauma of the upper lid blinking over the redundant bulbar conjunctiva
  - Tx w local cautery and conjunctival resection, both of which lead a tight adhesion of the conjunctiva to the underlying sclera, support this theory

- Wide variety of topical treatments used w inconsistent degrees of success:
  - 0.5% to 1.0% silver nitrate solution to the upper tarsal and bulbar conjunctiva
  - Topical steroids
  - Lubricants
  - Punctal occlusion
  - Cyclosporine
  - Cromolyn sodium
  - NSAID's

**Occult Foreign Body**

- Ocular surface foreign bodies sometimes become sequestered in the upper conjunctival fornix
- Because of the depth of the fornix and the fact that this area is not easily seen on examination, without double eversion of the eyelid, these foreign bodies can escape detection and persist, in some cases, for years
- A number of different foreign bodies have been implicated in causing a variety of forms of inflammation, including conjunctival mass lesions, granulomas, and follicular conjunctivitis

**Bilateral Chronic Papillary Conjunctivitis**

**Bilateral CPC**

- The common causes of bilateral CPC are:
  - Blepharoconjunctivitis
  - Anterior Blepharitis
  - Posterior Blepharitis
  - Keratoconjunctivitis Sicca
  - Conjunctivochalasis
- These diseases commonly coexist and can have an interrelated pathogenesis leading to patient symptoms

**Anterior Blepharitis**

- Anterior blepharitis primarily affects the eyelashes and lash follicle, and is subdivided into:
  - Staphylococcal
  - Seborrheic
  - Mixed forms
- Classical staphylococcal blepharitis
  - Ulcerations at the base of the eyelashes
  - They form a crust at the base of the lash that exfoliates, continuing to surround the lash leading to classic “collarette”
- Seborrheic blepharitis
  - Greasy, dandruff-like scales that adhere to the side of the lash rather than surrounding it
  - Typically have true dandruff

- Nonspecific treatments that are recommended for virtually all forms of blepharitis include warm compresses and cleaning of the eyelashes and eyelid margins with dilute baby shampoo or commercially available cleaning pads
- Warm to hot compresses increase blood flow to the eyelids, soften secretions for easier cleaning, and liquefy meibomian oils for better drainage
- Eyelid cleansing removes debris from the eye that could cause foreign body sensation
- Mechanically reduces the number of bacterial organisms, and removes material obstructing meibomian orifices to improve flow of oils
- Massage of the eyelids, directing oils toward the gland orifices, also improves drainage
Posterior Blepharitis

- Meibomian gland dysfunction (MGD)
  - Inflammation in the meibomian glands
  - Thickening of the eyelid margin
  - Dilatation of the meibomian glands visible through the conjunctiva (*"piano keyboard sign"")
  - Inspissation of the meibomian orifices with markedly thickened meibomian secretions
- MGD is strongly associated with rosacea
- Chalazia are much more common in patients with MGD, and subcute micro-chalazia can cause focal redness, swelling, and tenderness

Posterior Blepharitis

- Antibiotics can be used for their anti-inflammatory and/or anti-lipolytic properties
  - Azithromycin in a long-acting vehicle (AzaSite) concentrates in meibomian glands, has anti-inflammatory as well as anti-bacterial properties
  - Oral tetracyclines (doxycycline 50 to 100 mg/day or minocycline 25 to 50 mg/day) also concentrate in meibomian glands
  - Inhibit matrix metalloproteinases
  - Inhibit lipases that generate inflammatory free fatty acids, produced by the commensal bacterium Propionibacterium acnes
  - Topical cyclopentolate (Restasis)
  - Omega-3 fatty acid supplements (up to 6 grams/day)
- Mechanical meibomian gland probing
- Lipiflow

Keratoconjunctivitis Sicca

- Chronic conjunctivitis and keratitis secondary to a dry eye
- Symptomatic therapy for dry eye fails to provide symptomatic relief
- The diagnosis of keratoconjunctivitis sicca should be suspected when intensive therapy for dry eye fails to give symptomatic relief
- Severe Level 1: Edentulous and counseling
- Severe Level 2: Environmental modifications
- Severe Level 3: Corticosteroids
- Severe Level 4: Surgery

Keratoconjunctivitis Sicca

- Severe Level 1: Conjunctival scarring
- Severe Level 2: Filamentary keratitis
- Severe Level 3: Central corneal staining
- Severe Level 4: Severe symptoms

Conjunctivochalasis

- Refers to redundancy of the conjunctiva
- Most commonly affecting the inferior bulbar area
- Causes symptoms similar to keratoconjunctivitis sicca by a number of mechanisms:
  - Redundant area of conjunctiva can be chronically exposed and inflamed
  - Covering the lower punctal opening, creating symptoms of epiphora
  - By destabilizing the tear film
- The diagnosis of conjunctivochalasis should be suspected when intensive therapy for dry eye fails to give symptomatic relief

Conjunctivochalasis

- Treat with lubricants and mild topical steroids
- Nocturnal exposure can be treated with ointments and patching
- When medical treatment fails
  - Surgical excision of the redundant conjunctiva is necessary
  - Excess tissue can be burned away with a cautery at slit lamp
By accurately identifying physical findings and categorizing cases of chronic conjunctivitis

Remember Classification System

1. Time course
2. Morphology
   - Papillae
   - Large Papillae
   - Follicle
   - Membranous
   - Cicatrizing
3. Localization of disease process
4. Type of discharge or exudate

Individual cases can be analyzed within a limited differential diagnosis

Once an accurate diagnosis is made, treatment is generally straightforward and successful

Thank you

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