CONJUNCTIVA

Applied anatomy

The conjunctiva is a transparent membrane which consist of epithelium and stroma (substantia - propria )

**Subdivisions :**
1. Palpebral conjunctiva
2. Forniceal conjunctiva
3. Bulbar conjunctiva

**Glands :**
1. Mucin secretors : goblets cells , crypts of henle , glands of manz.
2. Accessory lacrimal glands : Krause and wolfring .

Clinical evaluation

**Symptoms :-**
1. Non specific : lacrimation , irritation , stinging , burning & photophobia
2. Pain : foreign body sensation
3. Itching : is seen in cases of allergy , blephritis & kerato-conjunctivitis sicca

**Discharge :-**
1. Watery ---- viral & allergy
2. Mucoid ---- VKC & keratoconjunctivitis sicca
3. Purulent ---- severe bacterial infection
4. Mucopurulent ---- bacterial & chlamydial infection.

**Conjunctival reaction :-**
- Conjunctival injection == bacterial infection
- Subconjunctival haemorrhage == ( viral infection , streptococcus pneumonia , hemophilus aegypticus )
- Oedema ( chemosis ) == in sever conjunctival inflammation
Scarring === (trachoma, ocular cicatricial pemphigoid, atopic conjunctivitis & long use of topical medication)

Follicular reaction: is a hyperplastic lymphoid tissue (viral inf., chlamydial inf., perinaud oculoglandular syndrome, drug allergy or toxicity).

Papillary reaction: is a hyperplastic conjunctival epithelium with central vessels (chronic blepharitis, allergy, bacterial conjunctivitis, contact lens wear, superior limbic keratoconjunctivitis, floppy eyelid syndrome).

**Membranes:**

*Pseudo membranes (with peeling -- not bleed)*
- Adenoviral infection
- Gonococcal infection
- Ligneous conjunctivitis
- Steven-Johnson syndrome

*True membranes (with peeling – painful and bleed)*
- Streptococcus pyogens
- Diphtheria

**Lymphadenopathy:**
- Viral infection
- Chlamydial infection
- Gonococcal infection
- Parin and oculoglandular syndrome

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**Laboratory investigation**

**Indications:**
- Severe purulent conjunctivitis.
- Follicular conjunctivitis.
- Chronic conjunctival inflammation.
- Neonatal conjunctivitis.

**Lab. Investigations:**
1- Cultures.
2- Cytological studies
3- Detection of viral or chlamydial antigens
4- Polymerase chain reaction (PCR)
5- Cellular (chemical and immunological) staining techniques.

Bacterial conjunctivitis

1-Simple bacterial conjunctivitis:-
- Common and self limiting
- Most common affect children

Signs and symptoms:
- Presentation with acute onset of redness and mucopurulent discharge (on waking the eyelids are frequently stuck together)
- Both eyes are usually involved

Treatment
- Usually resolve within 2 weeks even without treatment.
- Antibiotic drops: like chloramphenicol, gentamycin, ciprofloxacin, neomycin, tobramycin, or fucidic acid. (given during day)
- Antibiotic ointment: like chloramphenicol, gentamycin, tetracyclin, faramycetin & poly fax. (given at bed time)

2-Gonococcal conjunctivitis:-
- Caused by Neisseria Gonorrhoeae "dibloococcus"

Signs and symptoms:
-- Is a venereal G.U.T infection.
-- Presentation with acute, profuse, and purulent Conjunctival discharge.
-- Intense conjunctival inflammation, chemosis, and frequently with pseudomembrane.
-- Lymphadenopathy is prominent.
-- Keratitis with ulceration of cornea may occur which may rapidly lead to perforation and endophalmitis.
Treatment:
- Admission to hospital.
- Culture and sensitivity test.
- Systemic treatment ==== cefotaxime or ceftriaxone 1 gm(I.V) 2 times for (1 day).
- Topical treatment ==== gentamycin, bacitracin or quinolones.

**Neonatal conjunctivitis**
((Ophthalmia neonatorum)) : Conjunctival inflammation that occurs during the first month of life.

**Causes:**

1-Chlamydial conjunctivitis: -
- Is the most common cause of neonatal conjunctivitis in developing countries.
- Presentation is between 5-14 days
- With an acute mucopurulent discharge
- The conjunctival reaction is papillary because the infant can not form follicles until about the third month.
- Treatment with topical tetracycline and oral erythromycin (for 2 weeks).

2-Simple bacterial conjunctivitis: -
- May present at any time
- Caused by strept. staphylococcus and H.influenza.

3-Chemical conjunctivitis: -
- Presentation within few hours of delivery
- May be caused by silver nitrate or antibiotic used as prophylaxis against gonococcal infection.

4-Viral conjunctivitis "herpis simplex": -
- Presentation between 5-7 days
- Caused by H.S type 2
- Characterized by blepharconjunctivitis and may associated with keratitis.
5-Gonococcal conjunctivitis:
- Present between 1-3 days
- Is a rare cause of neonatal conjunctivitis
- Hyper acute purulent conjunctivitis with chemosis and may associated with keratitis
- Treated by systemic cefotaxime and topical gentamycin or quinolones.

Viral conjunctivitis

1-Adenoviral keratoconjunctivitis:
   a- Non-specific acute follicular conjunctivitis == is the most common and is caused by a range of adenoviral serological variants.
   b- Pharyngoconjunctival fever (PCF) == caused by adenovirus type 3,4,7.
   c- Epidemic keratoconjunctivitis (EKC) == caused by adenovirus type 8,19,37.

   presentation
   - Redness of conjunctiva
   - Watery or mucoid discharge
   - Conjunctival follicular reaction
   - Subconjunctival haemorrhage and Lymphadenopathy
   Treatment: no specific effective antiviral therapy but steroids or antibiotics may indicated for selected cases.

2-Molluscum contagiosum conjunctivitis:
Caused by DNA pox virus.

   Signs and symptoms:
   - The lid margin shows a small, pale waxy, umbilicated nodule.
   - Redness of conjunctiva
   - Watery or mucoid discharge
   - Conjunctival follicular reaction

   Treatment:
   - Is symptomatic and supportive
   - Destruction of the lid lesion of molluscum
Chlamydial infections

1-Adult chlamydial conjunctivitis:

- Is a sexually transmitted disease
- Caused by serotypes D-K of chlamydia trachomatis

Clinical features

- Sub acute unilateral or bilateral mucopurulent discharge
- Conjunctivitis become chronic and may persist 3-12 months without treatment
- Large follicles (( most in the inferior fornix ))
- Peripheral corneal infiltrates
- Tender lymphadenopathy
- Long standing cases are complicated by scarring of conjunctiva and a superior pannus.

Investigations

1- Direct monoclonal flourscent antibody microscopy
2- ELIZA
3- Cell culture (McCoy cell culture).
4- PCR
5- Staining techniques (Giemsa stain).

Treatment

a- Topical : tetracycline ointment for 6 weeks

b- Systemic :
- Azthromycin ( 1 gm) a single dose (and repeated after 1 week).
- Doxycycline 100 mg x2 for 1-2 weeks
- Erythromycin 500 mg x4 for 1 weeks

2-Neonatal chlamydial conjunctivitis:

- Is the most common cause of neonatal conjunctivitis.
- The infection transmitted from the mother during delivery.
- Presentation is usually 5-14 days after birth.

Clinical features

- Mucopurulent discharge
- Papillary conjunctival reaction
- Conjunctival scarring and corneal pannus in chronic cases
- It may be associated with otitis, rhinitis and pneumonitis.

**Treatment**

- **Topical**: tetracycline ointment
- **Systemic**: oral erythromycin 25 mg/kg x 2 (for 2 weeks)

(Systemic Tetracycline is contraindicated in children).

3-Trachoma:-

- It is a disease of poor population with poor hygiene conditions.
- The common fly is the major vector in the infective cycle.
- Caused by serotype A, B, Ba, C.

**Clinical features**

1- Presentation is during childhood with a mixed follicular/papillary conjunctivitis and mucopurulent discharge.

2- Chronic conjunctival inflammation with scarring (Arlt lines).
3- Limbal follicles (pathognomonic), when scarring occur called "Herbert pits"
4- End-stage trachoma:
   - severe corneal ulceration
   - corneal opacification
   - Trichiasis
   - Entropion
   - Dry eye

**WHO classification: grading:**

- TF == trachoma follicles (5 or more on the superior tarsus)
- TI == trachomatous inflammation (diffuse)
- Ts == trachomatous conjunctival scarring
- TT == trachomatous trichiasis
- CO == corneal opacity

**Treatment**

1- Single dose of erythromycin
2- The most important preventive measures is strict personal hygiene
3- Treatment of the complications.
1-Allergic rhino-conjunctivitis:
-it is the most common form of ocular and nasal allergy.
-it is a hypersensitivity reaction to specific air born antigen.

Classification :-
a- seasonal allergic R.C.(onset with hay fever in summer)
b- perennial allergic R.C.(onset through out of year with exacerbation in autumn)

C.F.:-
* transient , acute attack of redness , watering and itching
* associated with sneezing and nasal discharge
* conjunctival injection and edema
* small papillary reaction in superior tarsal conjunctiva

Treatment :-
a-topical mast cell stabilizer (nedocromil or lodoxamide)
b-topical antihistamine (levocabastine or emedastine)

2-Vernal keratoconjunctivitis:-(spring catarrh)
-is a bilateral, recurrent allergic disorder
-IGE and cell-mediated immune mechanisms play an important role
-primary affect boys and young adults living in warm dry climates.
-Onset is after the age of 5 years.
-3/4 of patients have associated atopy
-2/3 of patients have (+ve) F.H.

Classification:-
= palpebral
= limbal
= mixed
C.F.:-
*itching, lacrimation, photophobia, F.B. sensation
*diffuse papillary reaction (hyperatrophy)
*cobblestone appearance (large flat papillae)
*giant papillae in sever cases
*mucous discharge
*epithelial corneal erosions and ulceration in sever cases
*plaque formation (desicated mucus coats the base of the ulcer)
*mucoid nodules around the limbus (trantas dots.)

Treatment :-
a-topical:-
- steroids
  -mast cell stabilizers (lodoxamide/nedocromil)
  -antihistamine-like (levocabastine)
  -acetyl cysteine 0.5% for mucolytic
  -cyclosporine 2% for steroid resistant cases.

b-supra-tarsal steroid injection:
  (betamethasone or triamcinolone)

c-surgery:
  -sever shield ulcer
  -debridement
  -superficial keratectomy
  -excimer laser keratectomy

3-Atopic keratoconjunctivitis:
It is a rare disease effects young men with atopic dermatitis.
C.F.:-
-lids are red, thickened, fissured, associated with chronic staphylococcal blepharitis.
-inferior fornical & tarsal conjunctivitis.
-epithelial corneal erosions & ulceration.
-patient with atopic dermatitis may develop keratoconus, cataract or retinal detachment.
Treatment:
*topical: antibiotics, lubricants, steroids, mast cell stabilizers, anti-histamine & cyclosporins.
*systemic: antihistamines, antibiotics & cyclosporine.

Conjunctival degenerations

1- Pinguexula:
-extremely common, usually bilateral & asymptomatic.

C.F.: yellow-white deposits on the bulbar conjunctiva adjacent to nasal or temporal limbus.

Treatment:
The treatment is usually unnecessary but in case of acutely inflamed (pingueculitis) a short course of a weak steroid like fluoromethelon is indicated.

2- Pterygium:
- it is a triangular fibro vascular sub-epithelial ingrowth of the degenerative bulbar conjunctiva tissue over the limbus on to the cornea.
- It is typically develops in patients who have been living in a hot climates (dryness & U.V. light exposure).

C.F.: in mild cases: small, grey colored corneal opacities near the nasal limbus then the conjunctiva overgrows the opacity & progressively encroaches onto the cornea in a triangular fashion.
A deposit of iron (stocker line) may be seen in the corneal epithelium.
It may cause blurring of vision when it involves the visual axis or by induced astigmatism.

Treatment:
The treatment is indicated for:
1- cosmotic reasons.
2- or visual involvement.
The treatment is done by:
surgical excision with or without conjunctival graft, mitomycin-c or beta-irradiation (to decrease the recurrence rate).
3-Concretions:
are common lesions which most frequently effect elderly patients.
Signs: small, multiple, chalky yellow-white deposits on the tarsal & fornieceal conjunctiva.
Treatment:
It is usually not necessary BUT if large and symptomatic (irritation) it can be removed with a needle under topical anesthesia.

4-Retention cyst: ((epithelial inclusion cyst)).
it is very common and usually asymptomatic. It is consist of thin-walled lesions containing clear fluid.
Treatment:
Simple puncture with a needle.

Keratoconjunctivitis sicca: (KCS)
It refers to a dry eye primarily resulting from aqueous tear deficiency.
Causes:
1-atrophy & fibrosis of the lacrimal tissue (e.g. sjogreen syndrome).
2-tumor of the lacrimal gland.
3-sarcoidosis.
4-blockage of the excretory ductules of the lacrimal gland (e.g. conjunctival scarring).
C.F.:
*irritation.
*mucous discharge.
*tear film abnormalities.
*filamentary keratitis.

The tear film abnormalities includes:
1-Rose Bengal test: stains the conjunctival & corneal filaments.
2-tear film break-up time (BUT) : If less than 10 seconds; it is abnormal.
3-schirmer test: if more than 15 mm it is normal after 5 minutes.

Treatment:
-topical tear substitutes.
-punctal occlusion.
a- Pigmented conjunctival lesions:

1- Conjunctival epithelial melanosis:
it is a benign condition seen in a dark skinned individuals. The pigmentation is within the epithelium.

2- Conjunctival ocular melanosis:
it is an uncommon condition that is due to melanocytic hyperplasia. If this condition is associated with skin melanosis so it is called (naevus of ota).

3- Conjunctival naevus:
it is an uncommon benign condition that is usually unilateral.
it is usually single, sharply demarcated, flat or slightly elevated intra epithelial lesion.
The treatment is usually by excision if indicated.

4- Primary acquired melanosis:
it is an uncommon condition, usually unilateral & typically effects middle aged white people.
It is characterized by irregular, unifocal or multifocal areas of flat, brown pigment of any part of the conjunctiva.
It is a pre-malignant condition.

Treatment: excision or cryotherapy

5- Conjunctival melanoma: (malignant tumor)
it forms 2% of all ocular malignancies.
it is characterized by single black or grey nodule.
Treatment:
Excision with or without cryotherapy or Mitomycin-c

b- Squamous tumors (non-pigmented tumors):
1- Conjunctival papilloma (benign tumor).
2- Conjunctival intraepithelial neoplasia (premalignant tumor).
3- Conjunctival squamous cell carcinoma (malignant tumour).
c-Miscellaneous tumours:
1- conjunctival sebaceous gland carcinoma.
2- conjunctival lymphoma.
3- conjunctival Kaposi sarcoma.
4- epibulbar choristoma (dermoid & lipodermoid).
5- conjunctival pyogenic granuloma.

Choristoma

It is a congenital overgrowth of the normal tissue in abnormal location. There are two types:

1-Dermoid:
this type contains a variety of tissues such as cartilage, fat, muscle, hair follicle, & sebaceous gland.
The presentation is usually in early childhood with smooth, soft yellowish subconjunctival masses that are most frequently located at the limbus.

Treatment:
Surgical excision.

2-Lipodermoid:
this type usually presents in adult life with soft movable sub-conjunctival mass most commonly located at the outer canthus.

Treatment:
By surgical excision BUT should be avoided if possible because of many surgical complications.