

## 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
    - Parinand oculoglandular syndrome

## *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
- Organisms : staph .Epidermidis , staph. aureus , strept. pneumonia & H.influenza .

### **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-Gonococal conjunctivitis :-**

- Caused by Neisseria Gonorrhoeae "diblococcus"

### **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 fluorescent antibody microscopy
- 2- ELISA
- 3- Cell culture (McCoy cell culture).
- 4- PCR
- 5- Staining techniques (Giemsa stain).

#### **Treatment**

- a- Topical : tetracycline ointment for 6 weeks
- b- Systemic :
  - Azithromycin ( 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

a- **Topical** : tetracycline ointment

b- **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 occure 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.

## *Allergic Inflammation*

### **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 patient have (+ve) F.H.

**Classification:-**

- = palpebral
- = limbal
- = mixed

### **C.F.:-**

- \*itching , lacrimation ,photophobia ,F.B.sensation
- \*diffuse papillary reaction (hyperatrophy)
- \*cobble stone appearance (large flat papillae)
- \*giant papillae in sever cases
- \*mucous discharge
- \*epith. 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 % → 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. :-**

- inferior forniceal & 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.

\*surgery : for cataract , keratoconus and R.D.

## Conjunctival degenerations

### 1-Pinguecula:

-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 fluorometholon is indicated.

### 2-Pterygium:

- it is a triangular fibro vascular sub-epithelial ingrowth of the degenerative bulbar conjunctival 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- cosmetic 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 & forniceal 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.

## *Conjunctival lesions*

## a-Pigmented conjunctival lesions:

### 1-Conjunctival epithelial melanosis:

it is a benign conditions seen in a dark skinned individuals. The pigmentation is within the epithelium.

### 2-Conjunctival ocular melanosis:

it is 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 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 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 (pre-malignant 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 sub-conjunctival 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.

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