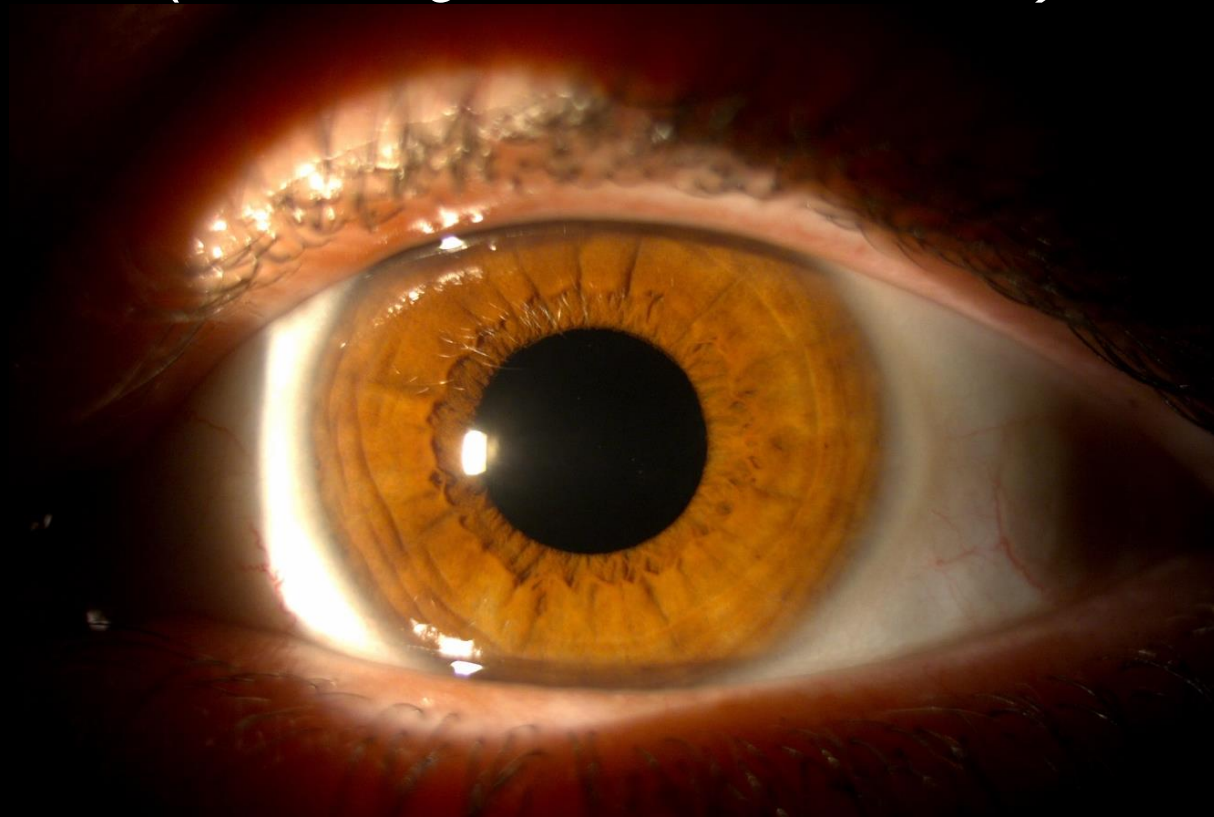


THE PROTECTION OF
THE EYE
(conjunctiva)



The protection of the eye is made of :

A. Eyelids

B. Orbital cavity

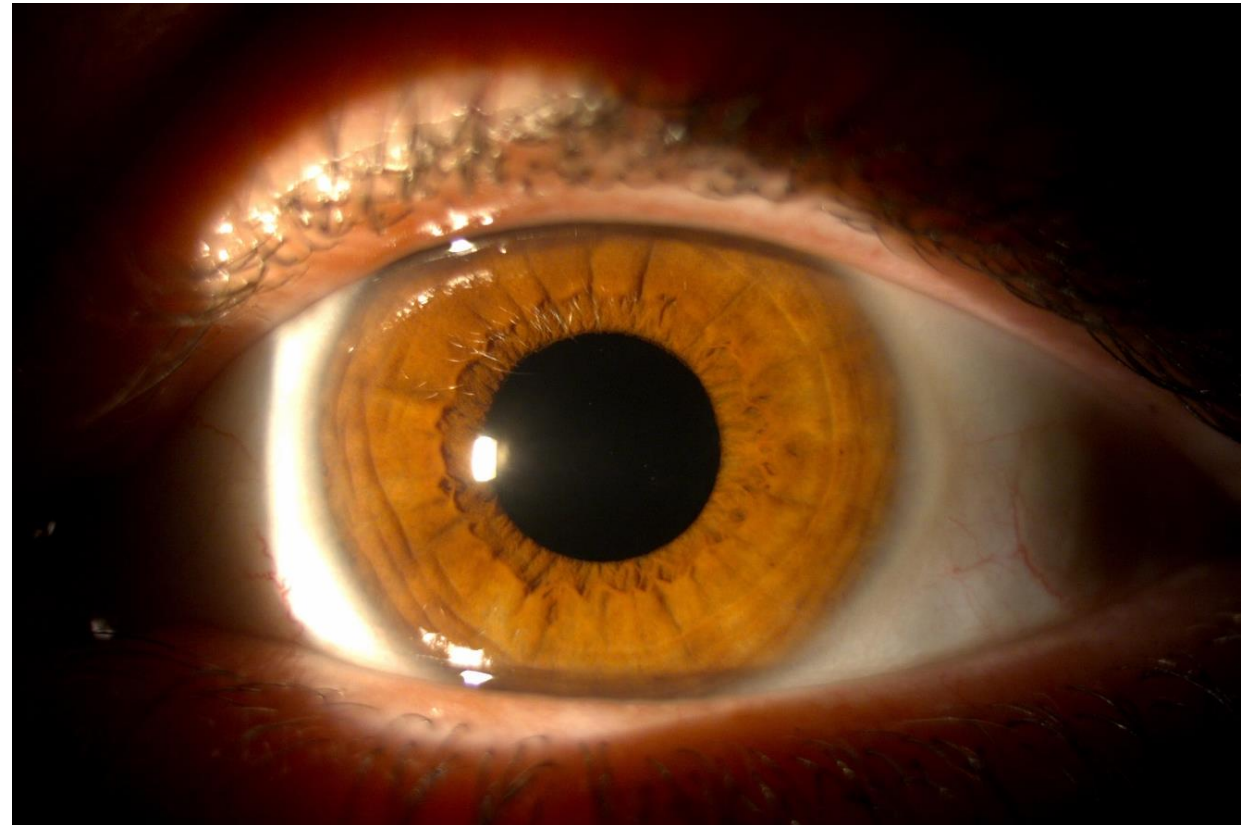
C. Conjunctiva

D. Lacrimal apparatus

E. Eye muscles

Conjunctiva

- *Thin, vascular mucous membrane that normally of shiny appearance*
- Richly vascular
- Dense lymphatic network - drainage to the preauricular and submandibular nodes (eyelids)
- Role in passive and active immunity



Anatomy

- **Is divided into three regions:**

1. Bulbar conjunctiva
2. Palpebral conjunctiva
3. Superior / inferior fornices

- **bulbar conjunctiva :**

- Covers anterior part of the eyeball
- Is loosely attached to the sclera and is more closely attached to the limbus of the cornea
- the conjunctival epithelium fuses with the corneal epithelium

Anatomy

- **palpebral conjunctiva**
 - It's a part of the inner surface of the eyelid and is firmly attached to the tarsus
- **conjunctival fornix**
 - Is the space formed by the junction of the bulbar and palpebral portions of the conjunctiva
- **plica semilunaris**
 - Is a semilunar fold of mucous membrane located in the medial corner of the palpebral fissure
- **lacrimal caruncle**
 - Is small, ovoid, pink coloured mass situated near the inner canthus

Histology

- Conjunctiva consists of two layers:
 1. Epithelium
 - 2-5 layers of epithelial cells
 - Non-keratinizing
 2. Stroma
 - lymphatic and fibrovascular tissue
 - Goblet cells
 - Krause and Wolfring glands
 - Crypt of Henle
 - Gland of Manz

Examination methods

Dye staining

- Defects and tears in the conjunctiva or cornea can be visualized by applying a drop of fluorescein dye or rose bengal and inspecting the eye under illumination with a cobalt blue filter

Double eversion (Desmarres eye retractor)

Conjunctival smear

Inspection – slit lamp

- The **bulbar conjunctiva** can be evaluated by direct inspection under a focused light
- Normally it is shiny and transparent
- The **other parts of the conjunctiva** can be inspected by everting the upper or lower eyelid

Symptoms and signs of conjunctival disorders

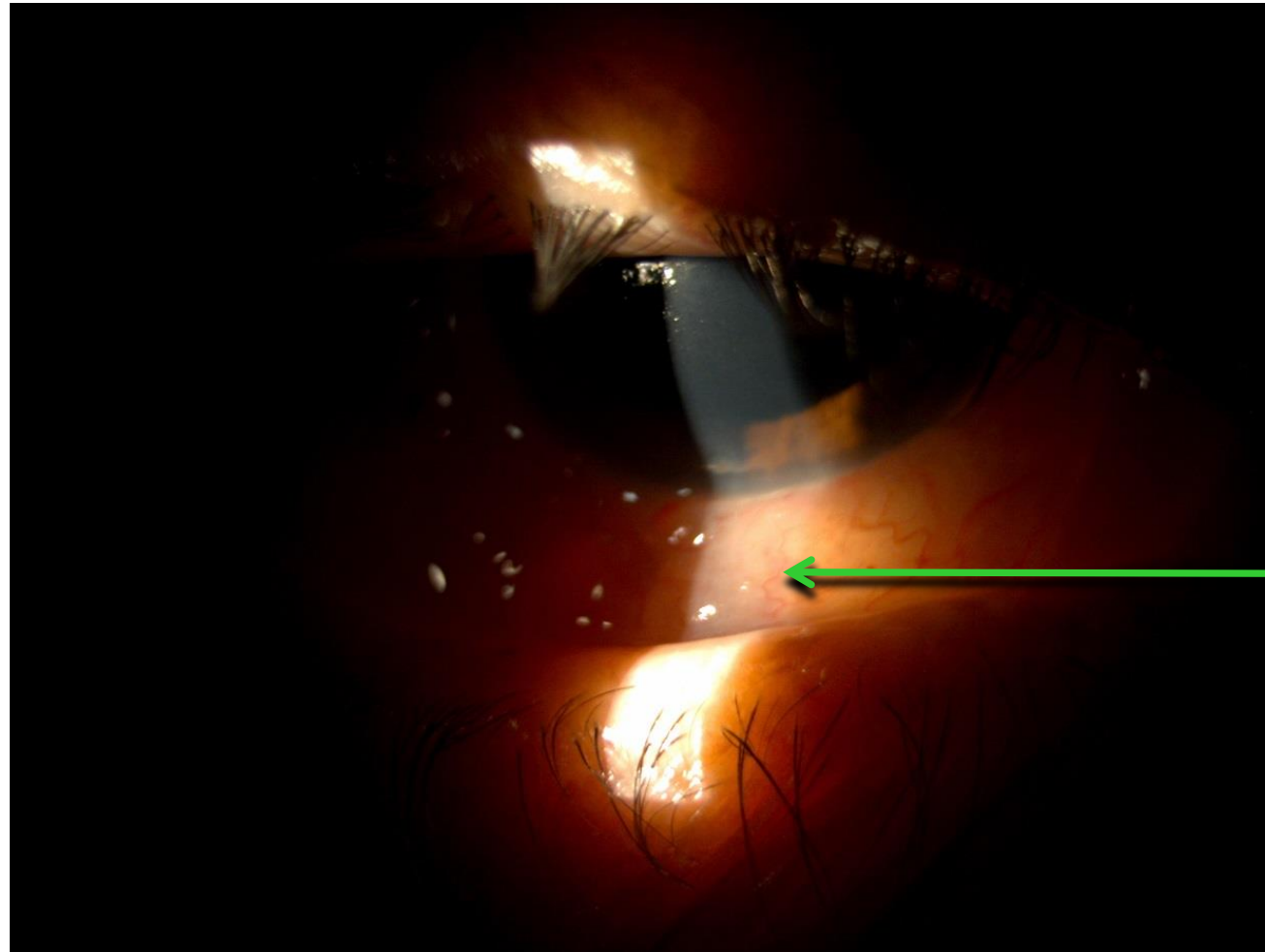
- Symptoms

- Lacrimation
- Ocular burning
- Grittiness
- Discomfort
- Foreign body sensation
- Blurred vision
- Itching – *allergic reactions*

- Signs

- Chemosis
- Vascular changes - hyperemia
- Subconjunctival hemorrhage
- Pigmentation
- Discharge
- Membranes, pseudomembranes
- Scarring
- Follicles
- Papillae

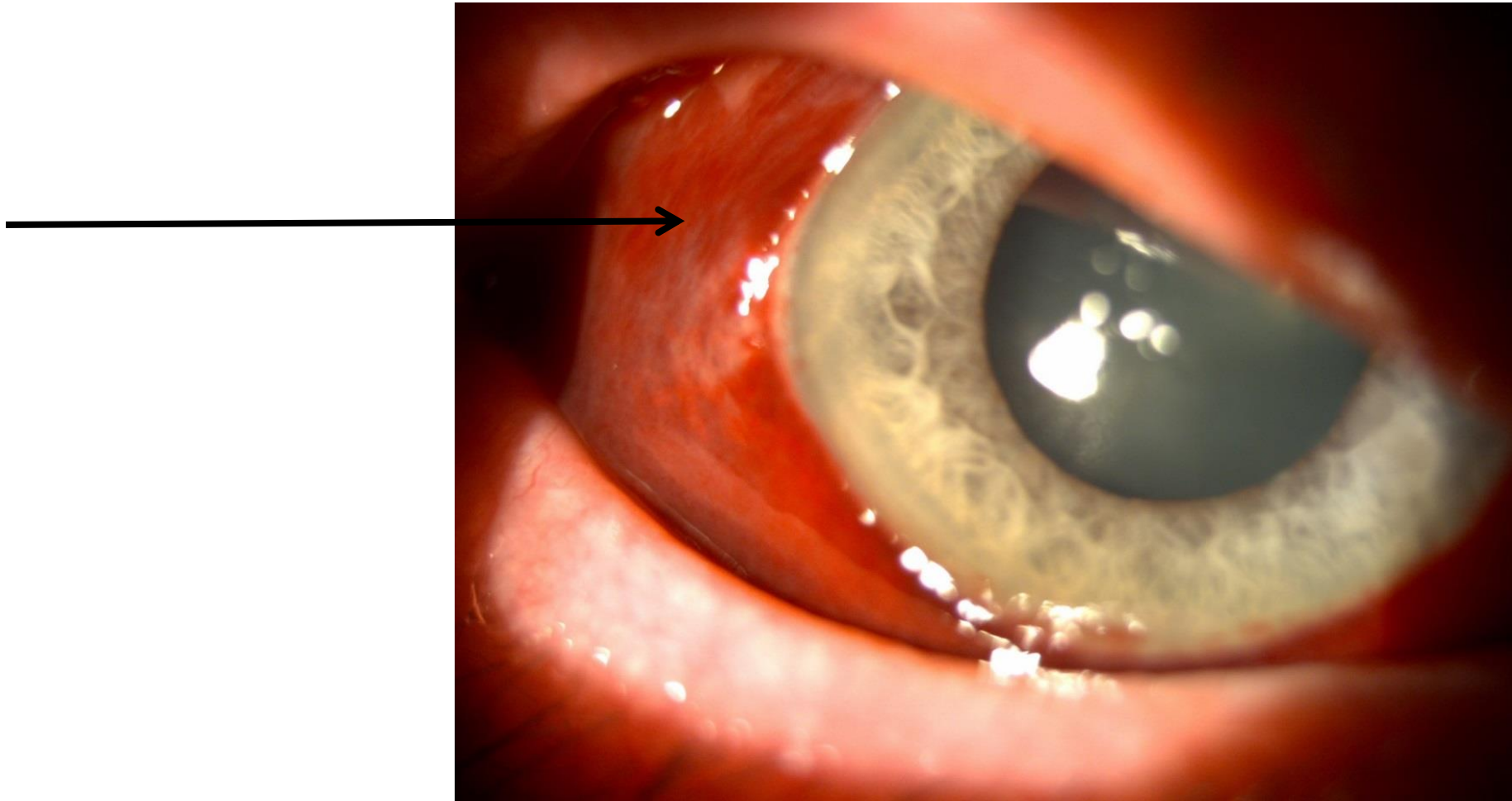
Chemosis



conjunctival oedema



Subconjunctival hemorrhage



Follicles

- **Etiology:** viral + chlamydial infection
- *Hyperplasia of lymphoid tissue within stroma resembling grains of rice*
- **Localization:** Inferior fornix

Papillae

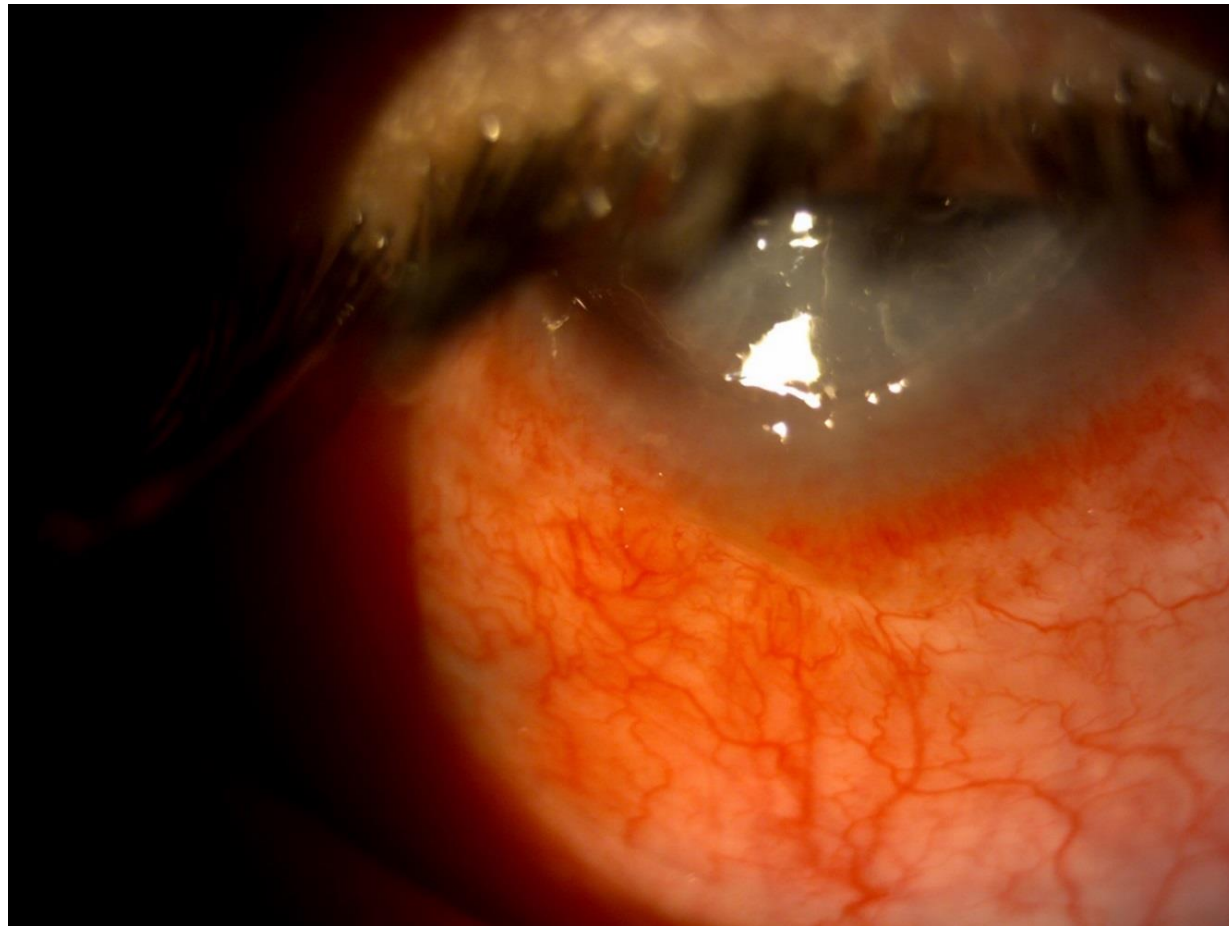
- **Etiology:** Bacterial+allergic+contact lens wear
- *Hyperplastic conjunctival epithelium*
- Micropapillae
- Macropapillae < 1mm
- Giant papillae > 1 mm

Discharge

- **Watery** - acute viral or allergic conjunctivitis
- **Mucoid** - chronic allergic conjunctivitis
- **Mucopurulent** - chlamydial or acute bacterial conjunctivitis
- **Moderate purulent** - acute bacterial conjunctivitis
- **Severe purulent** - gonococcal infection

Vascular changes - hyperemia „Red eye“

- **types of injection:**
 - Superficial / conjunctival
 - Subepithelial vessels dilatation
 - Deep/ciliary
 - Circumcorneal vessels dilatation
 - Mixed
- The conjunctival injection is a typical sign of conjunctivitis
- Deep/ciliary injection is sign of disorders of the uvea
- Mixed injection is sign of the corneal pathologies, glaucoma attack



Conjunctival Degenerations and Aging Changes

Pingueculum

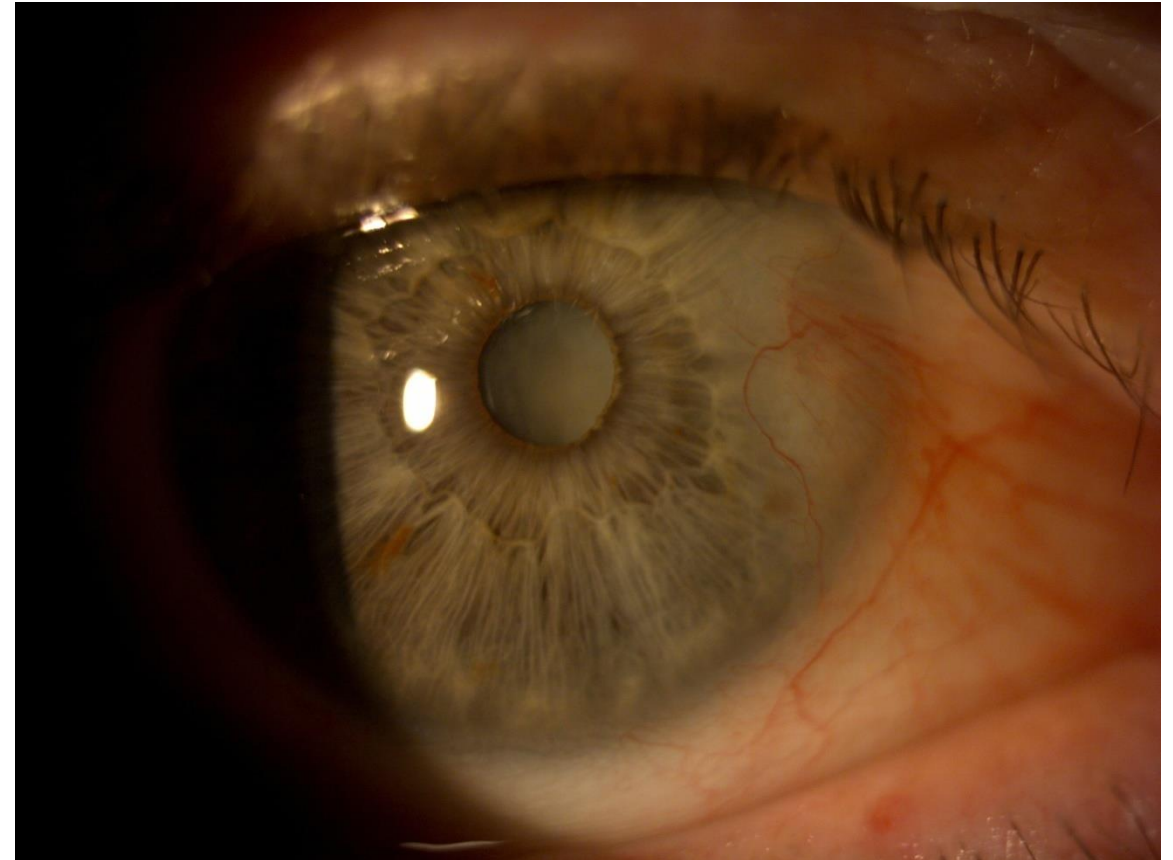
- *A benign degenerative tumor of the bulbar conjunctiva that appears as a yellowish white, slightly elevated tissue mass*
- degeneration of the conjunctival stroma
- **Etiology:**
 - Elderly people
 - Sun exposure
 - Wind
 - Dust

Pingueculum

- does not cause any symptoms
- bilateral
- nasally at 3 o'clock or 9 o'clock on the limbus
- No treatment is necessary
- Surgical excision for cosmetic reasons
- Inflammation „ pingueculitis “
- Pingueculitis - topical lubrication and topical steroids

Pterygium (*gr. word meaning „wing of butterfly“*)

- *Triangular fold of conjunctiva that usually grows from the medial portion of the palpebral fissure toward the cornea*
- **Etiology:**
 - Hot climates
 - ultraviolet exposure,
 - chronic surface dryness
 - pingueculum



- **Symptoms :**

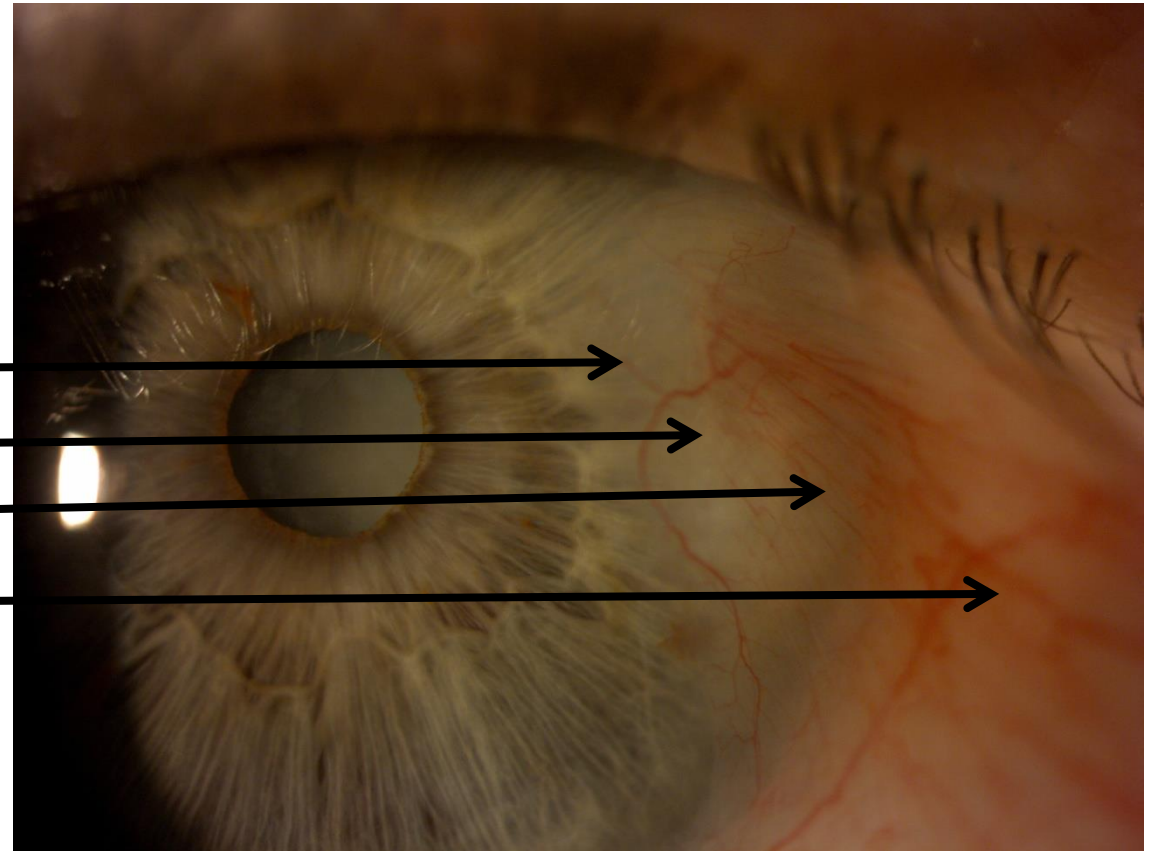
- A pterygium only produces symptoms when its head threatens the center of the cornea and with it the visual axis (corneal astigmatism)

- **Pterygium consist of:**

- A. cap
- B. head
- C. neck
- D. body
- E. Stocker line

- **Treatment:**

- Surgical



Pseudopterygium

- *Inflammatory adhesion of the conjunctiva to damaged cornea*

- **Etiology:**

- corneal injuries
- chemical injuries
- burns
- Inflammation

- **Symptoms and sign**

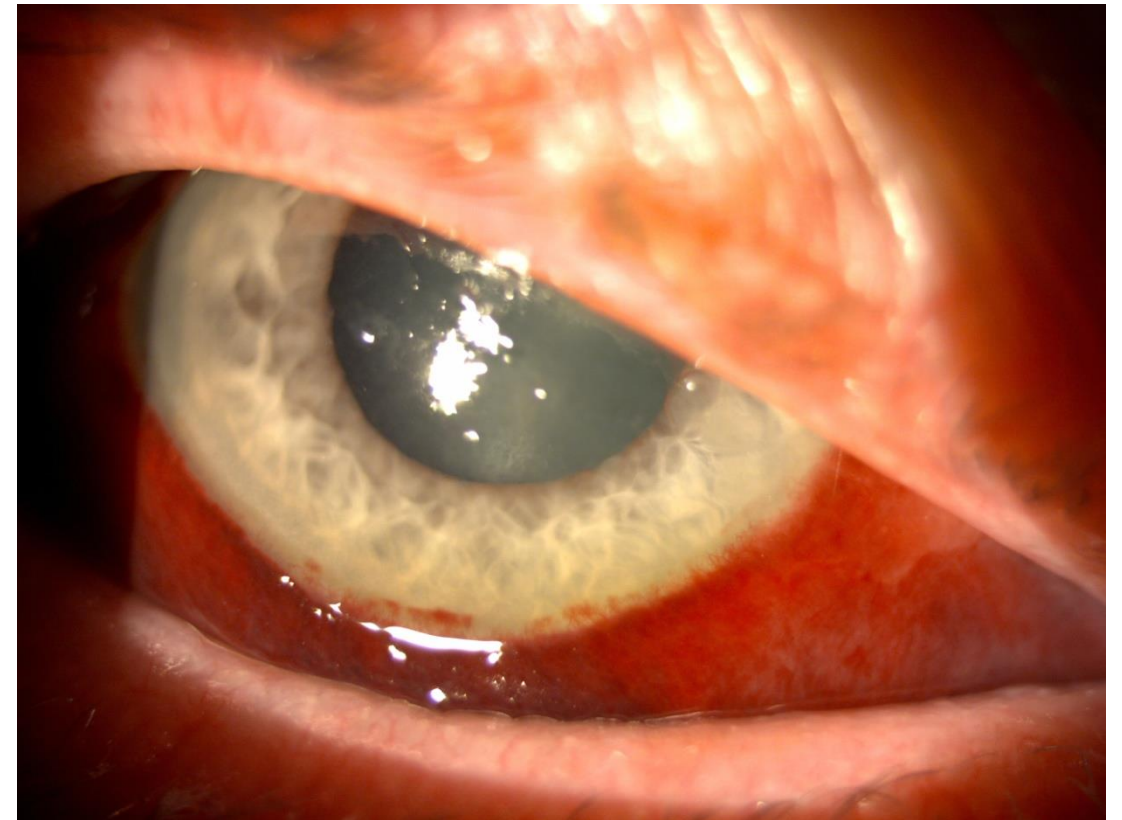
- pain
- double vision
- Situated at any meridian

- **Treatment** : Surgical - ablation

** **Probe test**—A probe can be passed easily beneath the neck of pseudopterygium as it is fixed to the cornea only at its apex*

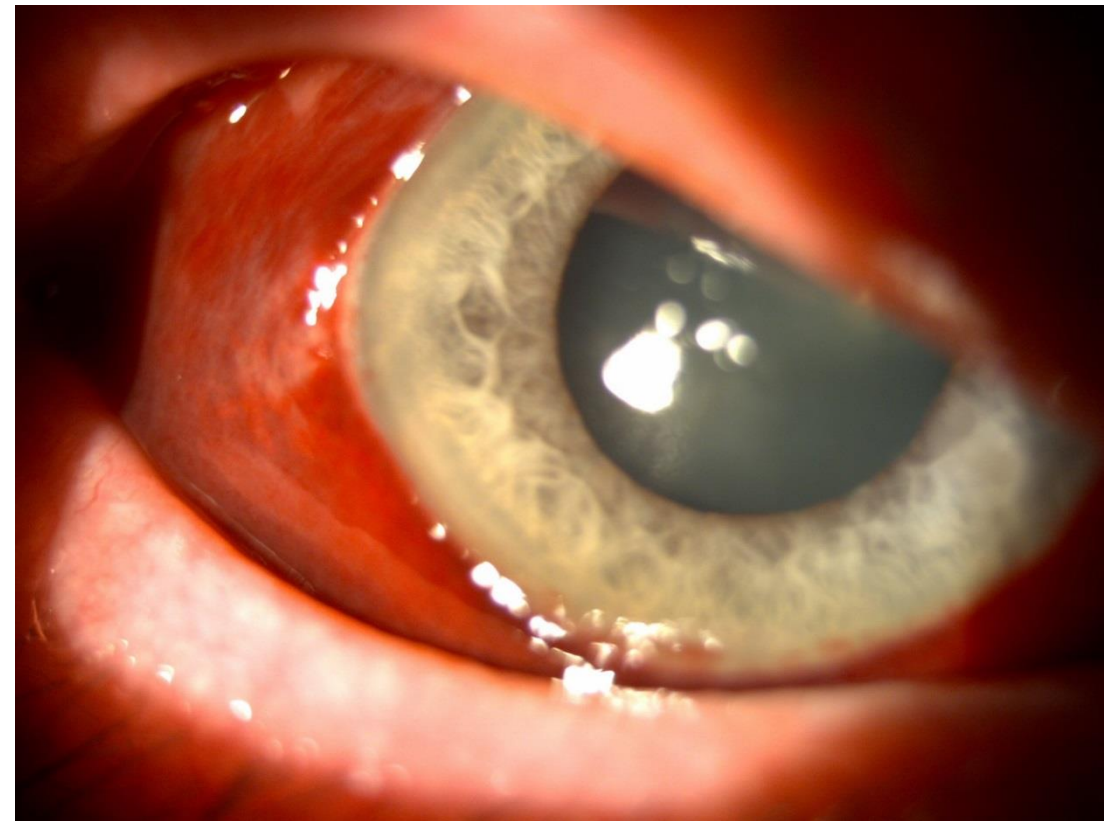
Subconjunctival hemorrhage

- *Extensive bleeding under the conjunctiva*
- **Etiology:**
 - conjunctival injuries
 - spontaneously in elderly patients (as a result of arteriosclerosis)
 - after coughing
 - Sneezing
 - pressing
 - bending over
 - lifting heavy objects
 - Vomiting



Subconjunctival hemorrhage

- Asymptomatic
- Harmless
- Fresh bright red blood is visible under the conjunctiva
- **Treatment:**
 - resolve spontaneously within 2 weeks
 - Vitamin C may help in healing process
- **NB:** *The patient's blood pressure, glycemia and coagulation status need only be checked to exclude hypertension, diabetes or coagulation disorders when subconjunctival hemorrhaging occurs repeatedly.*



Symblepharon

- *Is condition in which there are adhesions between the palpebral and bulbar conjunctiva*
- **Causes:**
 - Chemical burn injury
 - Thermal burns
 - Trachoma
 - Pphemphigoid
 - Membranous conjunctivits

Symblepharon

- **Signs**

- mechanical defect
- desiccation of the cornea
- keratitis!

- **Treatment :**

- A glass rod and lubricant or ointment is swept around the upper and lower fornix several times a day
- reconstruction surgery

Inflammation

(conjunctivitis)

the most frequent eye disorder

Conjunctivitis

- **Classification based on cause:**
 - **non-infectious:** allergic, lacrimal,
 - **Infectious :** viral, bacterial, fungal, parasitic
- **Classification based on the type of exudate:**
 - Catarrhal, purulent, mucopurulent, membranous
- **Classification based on duration:**
 - Acute- duration is less than four weeks
 - subacute
 - chronic - duration is longer than three to four weeks

Infectious conjunctivitis

Bacterial conjunctivitis

- **Etiology:**

- **Pathogens:** *Staphylococcus, streptococcus, pneumococcus*
- **Risk factors:** infected individuals, contact lenses, sinusitis, immunodeficiency states

- **Symptoms and signs:**

- eyelid oedema
- conjunctival injection
- chemosis
- Papillae
- mucopurulent discharge , yellowish crusts

Bacterial conjunctivitis

- **Diagnosis**

- History
- Clinical examination
- Severe, uncertain, or persistent cases require microbiological examination to identify the pathogen **E.g.: Gram and Giems**

- **Treatment:**

- ATB drops / ointment
- washing of the eyes with clean water
- good hygiene (eg, washing hands with soap and water)

Chlamydial Conjunctivitis (Trachoma)

- ❖ *Trachoma is the world's leading infectious cause of blindness*
- ❖ *Trachoma is endemic in parts of Africa, Asia, the Middle East, Latin America, the Pacific Islands, and aboriginal communities in Australia*

Etiology:

- **Pathogen:** *Chlamydia trachomatis* serotype A,B,C
- gram-negative, obligate intracellular bacteria
- It is commonly seen in unhygienic, crowded, dusty and dirty environment
- Left untreated, the disorder progresses through four stages

WHO grading of trachoma

Trachomatous inflammation, follicular (TF)

- is the presence of 5 or more follicles (each at least 0.5 mm in diameter) on the central part of the upper tarsal conjunctiva
- Herbert pits - follicles at the limbus

WHO grading of trachoma

Trachomatous inflammation, intense (TI)

- is pronounced inflammatory thickening of the upper tarsal conjunctiva that obscures more than one half the normal deep tarsal vessels
- Thick, velvet conjunctiva
- Papillae

WHO grading of trachoma

Trachomatous scarring (TS)

- is defined as the presence of easily visible scars in the tarsal conjunctiva
- This form may be associated with the development of dry eye syndrome, bacterial conjunctivitis and dacryocystitis

WHO grading of trachoma

Trichomatous trichiasis (TT)

- is defined as the presence of at least 1 eyelash rubbing on the eyeball or evidence of recent removal of in-turned lashes
- Trichiasis is due to subconjunctival fibrosis over the tarsal plate that leads to lid distortion

WHO grading of trachoma

Corneal opacity (CO)

- is defined as easily visible corneal opacity over the pupil that is so dense that it blurs at least part of the pupillary margin when it is viewed through the opacity
- This condition includes pannus, epithelial vascularization, and infiltration only if it involves the central cornea

Trachoma

- **Diagnosis**
- History
- Clinical appearance
- PCR

- **Treatment**
- ("S") surgical (trichiasis surgery, entropion surgery)
- ("A") antibiotics (azithromycin, tetracycline)
- ("F") facial cleanliness
- ("E") environmental improvement (General improvements in personal and community hygiene)

Chlamydial Conjunctivitis *(Inclusion Conjunctivitis)*

- **Etiology:**
 - *Chlamydia trachomatis* serotype D, E, K
 - chronic follicular conjunctivitis
 - Oculogenital infection is caused by direct contact
 - **In the newborn** this occurs at birth through the cervical secretion
 - **In adults** it is primarily transmitted during sexual intercourse, and rarely from infection in poorly chlorinated swimming pools
 - **The incubation period:** 4-12 days

Inclusion Conjunctivitis *(Chlamydial Conjunctivitis)*

- **Signs:**
 - Conjunctival hyperemia
 - viscous discharge
 - Follicular reaction
 - Preauricular lymphadenopathy
 - vaginitis and/or cervicitis
 - nonsymptomatic urethritis

Inclusion Conjunctivitis *(Chlamydial Conjunctivitis)*

- **Diagnosis:**

- clinical appearance
- laboratory tests
- Chlamydia may be detected in conjunctival smears, by immunofluorescence, or in tissue cultures
- Gynecologic, urologic examination

- **Treatment:**

- *In adults*, the disorder is treated with tetracycline or erythromycin eyedrops or ointment over a period of four to six weeks
- *Children* should be treated with erythromycin instead of tetracycline

Viral conjunctivitis (*Adenoviral keratoconjunctivitis*)

- **Etiology:**
- highly contagious conjunctivitis
- is caused by *adenovirus*
- The most commonly associated serotypes include adenovirus 8, 19, and 37
- is spread by direct contact with eye secretions
- The incubation period is 2-14 days

Viral conjunctivitis *(Adenoviral keratoconjunctivitis)*

- Symptoms
- Irritation
- Soreness
- Photophobia
- foreign body sensation
- excessive tearing
- periorbital pain
- decreased visual acuity

Viral conjunctivitis (*Adenoviral keratoconjunctivitis*)

- **Signs:**

- pre-auricular lymphadenopathy
- Eyelid oedema
- watery discharge
- Conjunctival hyperaemia
- follicles
- Conjunctival haemorrhage
- Chemosis
- Membranes / pseudomembranes
- diffuse, focal epithelial keratitis, subepithelial opacities

Viral conjunctivitis (*Adenoviral keratoconjunctivitis*)

- Treatment

- Artificial tears
- Cold compresses
- Cycloplegic agents for severe photophobia
- Topical steroids
- Povidone iodine - dilute solution
- Topical antibiotics - if sec.bact. infection involves

Noninfectious Conjunctivitis

- Simple chronic conjunctivitis
- allergic conjunctivitis
- conjunctivitis sicca

Simple chronic conjunctivitis

- **Etiology:**
 - Irritation by smoke, dust, heat
 - Concretions
 - misplaced eye lashes
 - dacryocystitis
 - Foreign body
 - Seborrhoea
 - chronic intranasal infection

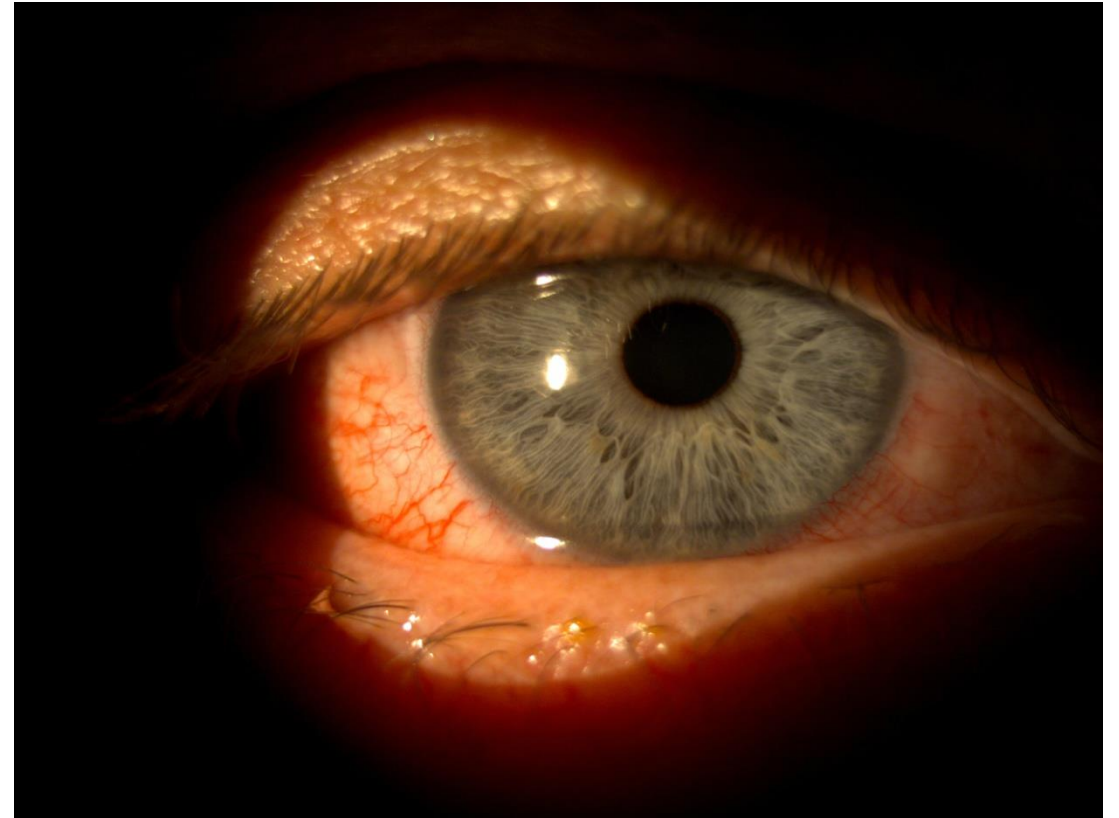
Simple chronic conjunctivitis

- **Symptoms and Signs**

- burning, grittiness
- The edges of the lids feel hot and dry
- Mild serous discharge
- Conjunctival hyperemia
- Papillae

- **Treatment**

- It depends on the cause
- ATB drops



Allergic conjunctivitis (seasonal and perennial)

1. Seasonal

- Allergens : pollen, ...
- worse during the spring and summer

2. Perennial

- Allergens : Animal dander, dust ...
- throughout the year, worse in the autumn

Allergic conjunctivitis (seasonal and perennial)

Signs

- lid oedema
- Chemosis
- Conjunctival hyperaemia
- mild papillary reaction
- Mucous discharge

Symptoms:

- Redness
- Watering
- Itching
- nasal discharge

Allergic conjunctivitis (Vernal conjunctivitis)

- *chronic bilateral inflammation of the conjunctiva, commonly associated with a personal and/or family history of atopy*
- **Onset:**
 - age of 5 years
 - primarily affects **boys**
 - The onset of VKC generally occurs in the first decade and persists throughout the first 2 decades

Allergic conjunctivitis (Vernal conjunctivitis)

- **RF:**

- 90%- asthma, eczema, atopy
- Late spring and summer
- Common in warm dry climates

Symptoms:

- Itching
- Lacrimation
- Photophobia
- foreign body sensation
- burning

Allergic conjunctivitis (Vernal conjunctivitis)

Signs

1. Palpebral

- Conjunctival hyperaemia
- diffuse papillary hypertrophy on superior tarsus
- Mucous deposition between giant papillae

2. Limbal

- Gelatinous limbal conjunctiva papillae
(Horner-Trantas dots)

Keratopathy

- KSP
- Macroerosions
- shield ulcer

Allergic conjunctivitis (atopic conjunctivitis)

- *bilateral inflammation of conjunctiva and eyelids, which has a strong association with atopy*
- Approximately 3% of the population is afflicted with atopic dermatitis, and, of these, approximately 25% have ocular involvement
- symptoms are perennial (seasonal variation)

- **Syptoms**
- Itching
- watery discharge
- redness
- photophobia

Allergic conjunctivitis (atopic conjunctivitis)

- Signs
- eczematoid dermatitis of the eyelids
- meibomian gland dysfunction
- keratinization.
- Blepharitis (STA)
- chemosis
- papillary reaction
- Corneal involvement

Allergic conjunctivitis *(Giant papillary conjunctivitis)*

- *is an immune-mediated inflammatory disorder of the superior tarsal conjunctiva*
- A combination of type I and type IV hypersensitivity reaction
- **Antigens**
 - contact lenses (hard and soft)
 - ocular prostheses
 - extruded scleral buckles
 - elevated glaucoma shunts or filtering blebs
 - scleral shells
 - exposed sutures

Allergic conjunctivitis *(Giant papillary conjunctivitis)*

- **Symptoms**

- ocular itching
- mucoid or ropy discharge
- foreign body sensation

- **Signs**

- large cobblestone papillae
- chronic bulbar conjunctival injection

Allergic conjunctivitis

- **Treatment**
- Artificial tears
- Systemic and/or topical antihistamines
- Vasoconstrictors
- Mast cell stabilizers
- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Corticosteroids
- Immunotherapy

Thank you for your
attention