Conjunctiva

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Conjunctival anatomy

Two Layers

- Epithelium
  (2-5 layers)
- Stroma
  -Vessels
  -Lymphoid tissue
  -Fibrous tissue

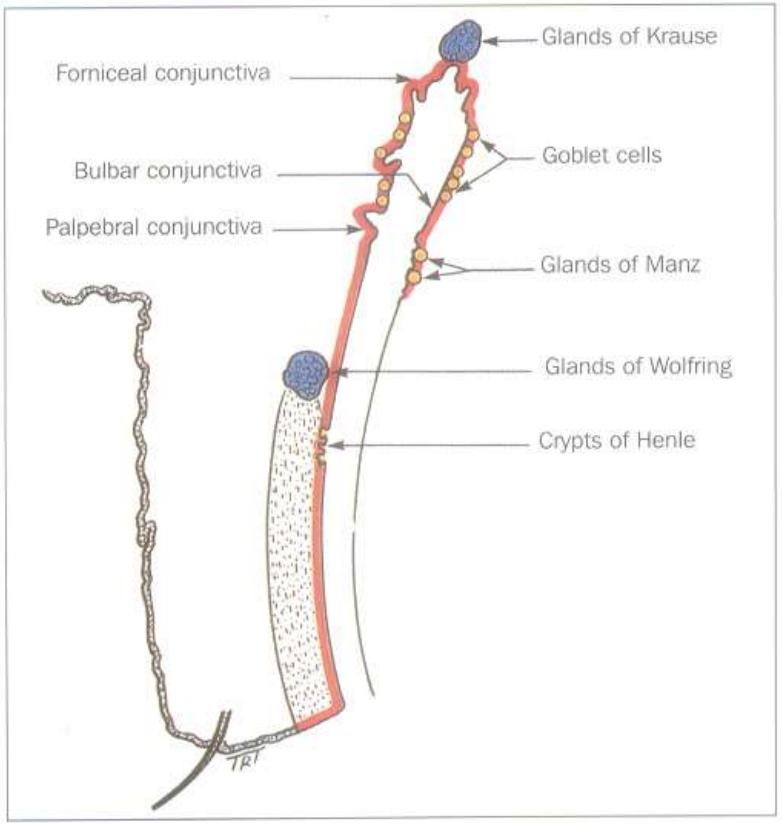


Figure 3.1 Anatomy of the conjunctiva and its glands

Evaluation of Conjunctival Inflammation

- Discharge
  - -Watery (viral, toxic)
  - -Mucinous (allergic, dry eye)
  - -Purulent (bacterial)
  - -Mucopurulent (bact., Trachoma)
- Reaction
  - -Hyperaemia ↑ in fornix
  - -Oedema translucent swelling

- **Follicles**

  -Elevated lymphoid follicles

  -Multiple

  - 0.5 - 5mm

  -Encircled by blood vessels

  -Viral, Trachoma, Toxic

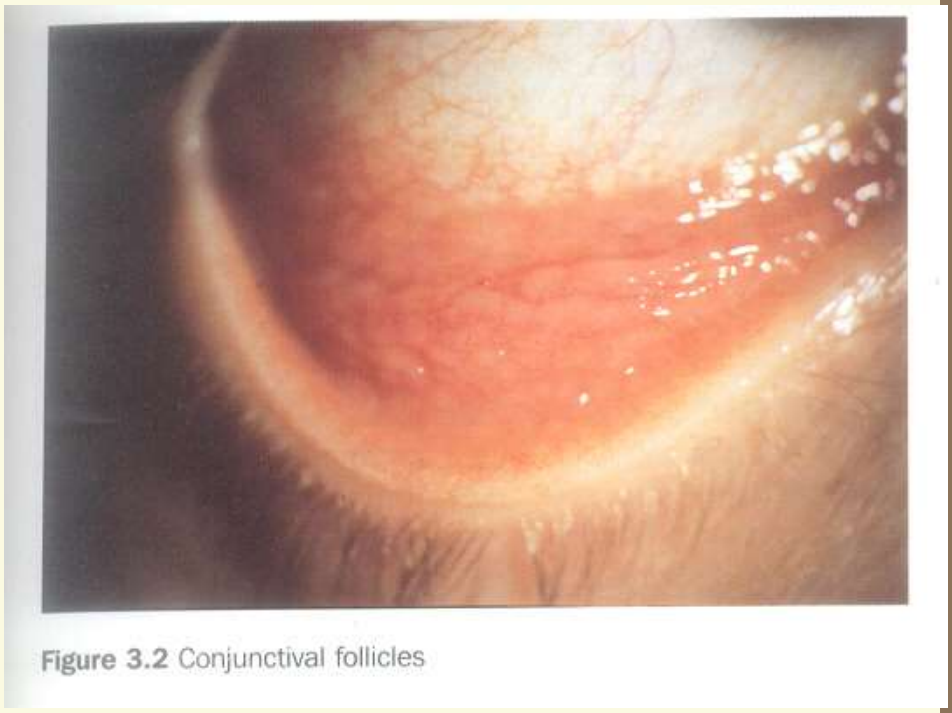


Figure 3.2 Conjunctival follicles

- **Papillae**

-Vascular structure invaded by inflammatory cells

-Hyperaemic areas separated by paler channels

-Bacterial, allergic

Figure 3.3 Conjunctival papillae involving the upper tarsal conjunctiva

Membranes

Pseudomembranes

- -peeled off from the epithelium
- -adenovirus, allergic, gonococcal

True membranes

- -peeling leads to bleeding
- -Diphtheria

Figure 3.8 Removal of a conjunctival pseudomembrane

- Subconjunctival haemmorhage
  - -Viral
  - -Bacterial (pneumo, hemophilus)
- Lymphadenopathy
  - Viral
  - Trachoma

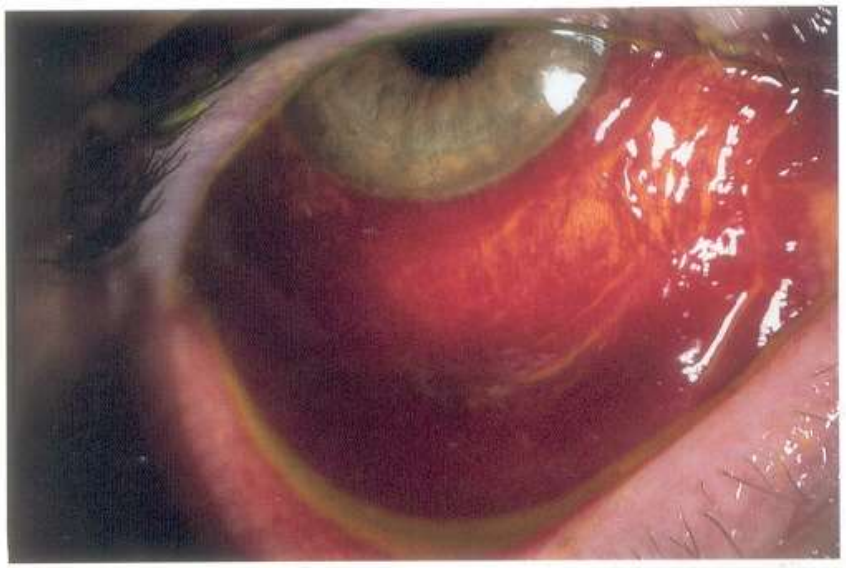


Figure 3.13 Subconjunctival haemorrhages in severe adenoviral conjunctivitis

Chemosis

Figure 3.10 Mucopurulent discharge in bacterial conjunctivitis

Conjunctivitis

- Infective
- Allergic
- Irritative
- Keratoconjunctivitis associated with skin and mucous membrane
- Traumatic

Bacterial conjunctivitis

Predisposing factors:

- Hot dry climate
- Poor hygiene, Flies
- Poor sanitation
- Epidemic

Bacterial

Organisms:

- Staphylococus aureus most common cause
- Stept pneumoniae causes haemorrhagic
- Strept haemolyticus assoc pseudomembraneous ,Diptheraeae causes membranous
- H influenzae cause epidemic
- Moraxella cause angular conjunctivitis
- Pseudomonas may invade cornea
- N gonorrhoeae, mengitidis cause mucopurulent

Bacterial conjunctivitis

Mode of infection:

- Exogenous
- Local spread
- Endogenous

Pathology:

- Vascular response
- Cellular response
- Conjunctival discharge

Accute mucopurulent conjunctivitis

Symptoms

- Foreign body sensation
- Photophobia
- Mucopurulent discharge
- Sticking lids
- Blurred vision with flakes
- Coloured haloes

Signs

-Congestion (↑ in fornix)

-Papillae

-Purulent/MP discharge

-Lid crusts

-Visual acuity usually normal

Treatment

- Resolves in 10-14 days
- Lab tests :Conjunctival swab/scraping (severe, recurrent, non responsive infants)
- Topical antibiotics and ointment HS (Fluroquinolones, aminoglycosides)
- Local hygiene
- Avoid finger eye contact and instrument eye contact

Accute Purulent conjunctivitis

- Two forms: Adult purulent and ophthalmia neonatorum
- Commonest organism is Gonococci others staph aureus and pneumococus

Clinical features

- Stage of infilteration: 4-5 days . Painful tender eyeball with red chemosed conjunctiva. Lids are swollen with with watery discharge. Preauricular nodes are enlarged

Accute Purulent conjunctivitis

- Stage of blenorrhoea: purulent thick discharge
- Stage of healing

Complications: corneal ulcer

Treatment:

- Broad spectrum topical and systemic antibiotics
- Ocular Hygiene

Accute membranous conjunctivitis

- Causative org is corynebacterium diptheriae
- Violent infl with fibrinous exudate with membrane

Clinical features:

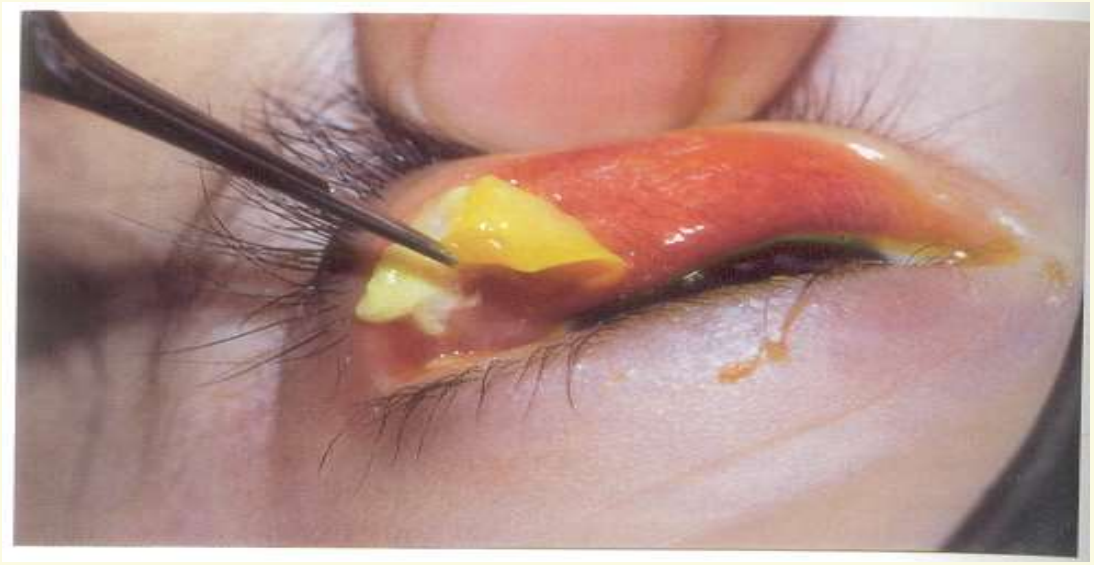
- Stage of infilteration- swollen hard lids, red chemosed conjunctiva with thick grey membrane
- scanty discharge with severe pain

Accute membranous conjunctivitis

- Stage of suppuration: Pain decrease with soft lids. The membrane is sloughed with copious discharge.
- Stage of cicatrisation : healing with cicatrisation, which may cause trichiasis and xerosis

Complications

Corneal ulcer, symblepharon, trichiasis, entropion and xerosis



Accute membranous conjunctivitis

Treatment

- Pencillin eye drops 1:10000/ml every half hrly
- Antidiptheric serum every hour
- Broad spectrum antibiotics oint

Systemic : crystalline pencillin 5lac units IM BD for 10 days

- ADS 50000units IM stat

Pseudomembranous conjunctivitis

- Bacteria like low virulence C dipth, staph,strept, N gonococci and H influnzae
- Virus like H simplex and adenovirus
- Chemical irritant like acid, ammonia, lime, Agno3

Pathology : Fibrinous exudate on surface which coagulate on surface as membrane which can be peeled off underlying intact epith

Chronic catarrhal conjunctivitis

- Predisposing factors- Dust, foreign body, seborrhoic scales, ref error etc
- Organism – Staph aureus, G –ve like E coli, klebsiella
- Source:

untreated mucopurulentconjunctivitis, chr dacryocystitis and URI

Chronic catarrhal conjunctivitis

- Clinical feature:
  - Chronic rednesss, FB sensation, tiredness, mucoid discharge and watering.
  - Signs – congestion, papilary hypertrophy, lid margin congestion, surface sticky.
- Treatment
  - Eliminate predisposition factors
  - Topical antibiotics
  - Nsaids

Angular conjunctivitis

- Chronic conjunctivitis with mild infl confined to conjunctiva and lid margins near the angles
- Organism – Moraxella Axenfield
- Source – Nasal cavity
- Pathology – Proteolytic enzyme
- Treatment- Tetracycline 1% 2 wks


EyeRounds.org

Trachoma

- Chronic keratoconjunctivitis affecting supf epithelium of the conjunctiva and cornea.
- Mixed follicular and papilary response.
- One of the leading cause of blindness

Etiology:

- Chlamydia trachomatis .it is epitheliotopic and produce inclusion bodies (HP bodies)
- 11 serotypes (A,B,Ba,C,D,E,F,G,H,J and K)
- A,B,Ba,C assoc with hyperendemic

Trachoma

- D-K assoc with paratrachoma or oculogenital trachoma
- Predisposition
  - Age no bar, more in females
  - Dry dusty weather and in poor class
- Source: Discharge of affected person
- Mode
  - Direct spread through contact
  - Vector -Flies

Trachoma

- Fomites- towels, tonometers etc

Natural course: Accute stage in first decade then inactive in second decade. The sequelae occurs in 4^{th} to 5^{th} decade.

- Symptoms- FB sensation, lacrimation, mucoid discharge. If sec bacterial infection then mucopurulent conjunctivitis .

Trachoma

Conjunctival Signs

- Congestion of tarsal and forniceal conjunctiva
- Conjunctival follicles- central part contain histiocytes, lymphocytes and giant cells (leber cell) ,cortex have lymphocytes and periphery have blood vessels. P/o of necrosis and leber cells differentiate trachoma from other follicular conjunctivitis

Trachoma

- Papillary hyperplasia
- Conjunctival scarring, linear scar k.a Arlts line
- Concretions – dead epithelial cells with inspissated mucous in glands of henle

Corneal signs:

- Superficial keratitis
- Heberts follicles
- Pannus- Progressive or regressive

Trachoma

- Corneal ulcer
- Heberts pits
- Corneal opacity

Grading

McCallan classification 1908

- Stage 1- incipient or stage of infilteration. Hyperemia of conjunctiva and immature follicles

Trachoma

- Stage 2- Established or florid. Mature follicles, papilae and progressive pannus.
- Stage 3- scarring of palpebral conjunctiva
- Stage 4- Sequelae.

WHO classification 1987 (FISTO)

- TF: Trachomatous infl-follicular- Five or more follicle each 0.5mm or more on upper tarsal conjunctiva. Deep tarsal vs visible

Trachoma

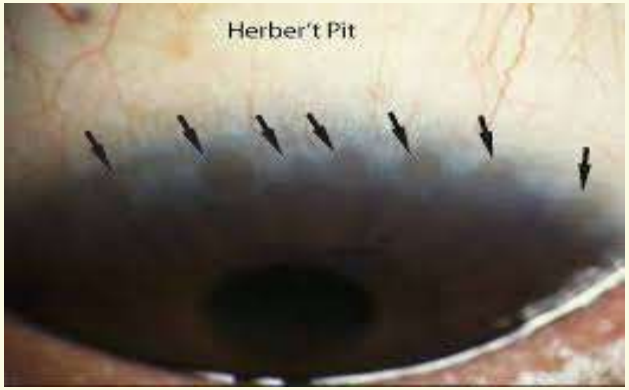
- TI : Trachomatous infl intense- Inflamatory thickening obscure more than half of deep tarsal vessels
- TS: scarring- white bands or sheets of scarring
- TT: Trachomatous trichiasis- atleast one eyelash rubs cornea
- CO: Opacity- partly obscuring pupil and vision < 6/18

Trachoma

Sequelae

- Lids- trichiasis, tylosis, ptosis, madarosis, ankyloblepharon
- Conjunctiva- concretions, pseudocysts, xerosis, symblepharon
- Corneal- opacity, ectasia, xerosis, pannus
- Other like chronic dacryocystitis and dacryoadenitis.

Complication : ulcer


Herber't Pit

Trachoma

Diagnosis

- Clinical
  - Conjunctival follicles and papilae
  - Pannus
  - Epithelial keratitis at superior limbus
  - Cicatrisation or sequelae
  -

Trachoma

LAB Diagnosis

- Conjunctival cytology- Geimsa stain show PMN, plasma and leber cells
- Inclusion bodies by geimsa, iodine stain or imf stain
- PCR
- Isolation by yolk sac culture

Trachoma

Differential diagnosis

- EKC - follicles in fornix, and lower palpebral conjunctiva, assoc papilae and pannus typical in trachoma.
- VKC- large papilae with cobble stone appearance.white ropy discharge

Trachoma

Management

- Active trachoma
  - Topical antibiotic- 1%tetracycline or 1% erythromycin ointment QID for 6 wks followed by intermittent tt in endemic areas
  - Systemic –Tetracycline or erythromycin 250mgQID 3-4 wks
  - Doxycycline 100mgBID 3-4 wks or single dose 1gm Azithromycin.
  - Combined therapy in severe cases

Trachoma

Treatment of sequelae

- Concretions – removal
- Trichiasis- epilation , electrolysis, cryolysis
- Entropion – surgery
- Xerosis – Artificial tears

Prophylaxis

- Hygiene
- SAFE and Blanket treatment

Adult Inclusion Conjunctivitis

- Chlamydia Trachomatis serotype D-K
- Source –urethritis in males and cervicitis in female
- Spread – contaminated fingers or pool
- I/C- 4-12 days

Symptoms:

Mucopurulent discharge, hyperemia, lacrimation, irritation and photophobia

Adult Inclusion Conjunctivitis

Signs :

- Hperemia and follicular rx in lower fornix.
- Mild supferficial keratitis
- Preauricular lymphadenopathy,
- If untreated leads to chr follicular conjunctivitis

Adult Inclusion Conjunctivitis

Treatment :

- Topical 1% tetracycline oint QID x6wks
- Systemic Doxycycline 100 mg BIDx 2wks
- Azithromycin 1g single dose
- Prophylaxis – Treat the partner and Hygiene.

Viral Conjunctivitis

- Mostly affect epith of conjunctiva and cornea

Viral infections of conjunctiva

- Adenovirus conjunctivitis
- H simplex keratoconjunctivitis
- H zoster conjunctivitis
- Myxo, Paramyxo virus Conjunctivitis
- ARBOR virus conjuctivitis,enterovirus 70 (picornavirus)

Viral Conjunctivitis

Clinical types

- Accute serous conjunctivitis
- Accute haemorrhagic conjunctivitis
- Accute follicular conjunctivitis

i. Adult inclusion conjunctivitis
ii. EKC conjunctivitis
iii. Pharyngoconjunctival fever
iv. New castle conjunctivitis
v. Accute herpetic

Viral Conjunctivitis

Accute serous conjunctivitis: mild infection with follicular response.

C/F- mild congestion, watery discharge and chemosis.

Treatment: self limiting.Broad spectrum antibiotics to prevent second bacterial infections.

Viral Conjunctivitis

Accute Haemorrhagic conjunctivitis:

- Enterovirus 70 ,spread eye to hand contact
- C/F- short incubation of 1-2 days
- Pain, redness, watering, photophobia, blurred vision and lid swelling
- Signs- congestion, chemosis, haemorrhages in bulbar conjunctiva, follicular hyperplasia, lid edema and preauricular lymphadenopathy, fine epith keratitis

Viral Conjunctivitis

Treatment: very contagious but self limiting course. Therefore prophylactic measures and broad spectrum antibiotics.

Viral Conjunctivitis

Accute follicular conjunctivitis

- Epidemic keratoconjunctivitis(EKC)
  - Occurs in epidemics and is assoc with follicular rx.
  - Etiology – Adenovirus 8and 19
  - C/F-

i. First phase(serous) non spf hyperemia watering and chemosis

ii. Follicles more marked in lower fornix

Viral Conjunctivitis

- Treatment- supportive and prophylactic antibiotics.

Pharyngoconjunctival fever

- Adenovirus 3and 7
- Primarily affects childrens and appear in epidemic form
- C/F- acc follicular rx with pharyngitis,fever and preaur lymphadenopathy and supf punctate keratitis
- Treatment : supportive

Viral Conjunctivitis

Newcastel conjunctivitis:

- Rare follicular conjunctivitis .caused by contacts with owls so common in poultry workers.
- C/F are same as PCF and treatment is supportive.

Viral Conjunctivitis

Accute Herpetic conjunctivitis

- Usually seen in childrens and adoloscents in assoc with primary herpetic infection
- Type 1 involves eyes and spread by kissing
- Type 2 assoc with genital infection rarely effects eyes
- C/F- incubation 3-10 days

Viral Conjunctivitis

- Typical form assoc with vesicles on face and lids
- Atypical without vesicles and resembles EKC
- Corneal involv rare but can occur as supff punctate keratitis and dendritic ulcer
- Treatment –self limiting but antiviral used when there is corneal invilv

Ophthalmia Neonatorum

B/L inflamation of conjunctiva in infant <30days old. Any watering in 1st wk should arouse suspicion.

Etiology

- Before birth- infected liquor in premature ruptured membranes
- Birth- infected birth canal. (Face present)
- After birth- unhygienic delivery. Soiled clothes,fingers or lochia

Ophthalmia Neonatorum

Agents:

- Chemical – Agno3
- Gonococcal- gonorrhoea in mother
- Staph aureus, srept haemolyticus and pneumonae.
- Neonatal inclusion conj . Serotype D-K
- H. Simplex 2

Ophthalmia Neonatorum

Incubation

- Chemical – 4-6 hrs
- Gonococcal- 2-4 days
- Other bacteria- 4-5 days
- Neonatal incl conj- 5-14 days
- H. simplex 5-7 days

Ophthalmia Neonatorum

Signs and symptoms

- Painful, swollen and tender lids
- Mucoid/mucopurulent discharge
- Corneal involv in h simplex

Complications

- Gonococcal corneal ulcer.
- Corneal perforation, staphyloma , opacity.

Ophthalmia Neonatorum

Management(Prophylaxis)

- Antenatal- treatment of genital infections
- Natal – Hygienic deliveries
- Postnatal- 1% AgNo3(credes method), 1% tetracycline or 0.5% erythromycin oint.

  50mg/kg IM/IV ceftriaxone to infants born to infected mothers.

Ophthalmia Neonatorum

Curative treatment

- Chemical is self limiting
- Infected – saline lavage
- Pencilin drops 5000- 10000U/ml every minute for ½ hrly then every min ½ hrly then ½ hrly till infection controled
- If resistant other broad spectrum like moxifloxacin, gatifloxacin

Ophthalmia Neonatorum

Systemic treatment

- Ceftriaxone 75-100mg/kg IV/IM QID
- Cefotaxime 100-150 mg/kg IV/IM BID
- Crystaline Benzyl pencillin 50000 u to full term and 20000u to premature IM BID for 3 days.
- Neonatal incl conj- 1% tetracycline or 0.5 % erythromycin qid for 3wks.systemic erythromycin 125mgorally QID x 3wks

Allergic conjunctivitis

- Inflamation of conjunctiva due to allergic or hypersenstivity rx which can be immediate (humoral) or delayed (cellular)

Types

A. Simple allergic conjunctivitis

a) Hay fever

b) Seasonal allergic conjunctivitis(SAC)

c) Perenial allergic conjunctivitis (PAC)

Allergic conjunctivitis

B. Vernal keratoconjunctivitis(VKC)

C. Atopic keratoconjunctivitis(AKC)

D. Giant Papillary conjunctivitis(GPC)

E. Phylectunlar keratoconjunctivitis(PKC)

F. Contact dermatoconjunctivitis(CDC)

Allergic conjunctivitis

Simple allergic conjunctivitis

- Hay fever- assoc with fever and allergic conjunc. Allergens are grass, pollens and animal dander.
- SAC- response to seasonal allergens like grass and pollens. Very common.
- PAC- allergens like house dust and mite.

Allergic conjunctivitis

Pathology

- Vascular- increased dilatation and permeability with exudation of fluid.
- Cellular – eosinophils, plasma and mast producing histamines.
- Conjunctival chemosis and papillary rx

Allergic conjunctivitis

Symptoms

- Itching, burning and watering

Signs –

- Chemosis, hyperemia, papillae, lid edema.

Diagnosis

- Clinical or eosinophils in discharge.

Allergic conjunctivitis

Treatment

- Elimination of allergen if possible
- Symptoms releif – vasoconstrictor like Naphazoline.
- Mast cell stablizer like sodium cromoglycate
- NSAIDS and topical antihitaminic and systemic
- Steroids

Allergic conjunctivitis

Vernal keratoconjunctivitis(VKC):

B//L self limiting allergic inflamation having seasonal incidence.

Etiology – Grass pollens

Pathology

- Conjunctival epithelial hyperplasia with with infilt of eosinophils, plasma cells.
- Vascular proliferation with increased permeability. Hyaline changes in chronic

Allergic conjunctivitis

Symptoms

- Marked itching, lacrimation with ropy discharge and heaviness in lids.

Signs

- Palpebral – flat topped papilae with cobble stone pattern. Giant papilae > 1mm
- Bulbar- dusky red congestion, tranta spots.
- Cornea- punctate keratitis, shield's ulcer, plaques, subepithelial scarring.

Palpebral type

- Hyperaemia
- Chemosis
- Papillae(giant) more in superior fornix
- ↑ size, flat topped (cobblestone), sticky and ropy discharge

Figure 3.33 Giant 'cobblestone' papillae on the superior tarsal conjunctiva in severe vernal conjunctivitis

Bulbar type

- Congestion
- Oedematous/ thickened conjunctival nodules
- Discrete white superficial spots (trantas dots)

Figure 3.35 Gelatinous superior limbal elevations with overlying fine white plaques (Trantas dots) in vernal limbitis

Allergic conjunctivitis

- Pseudogerontoxon- cupid bow outline.
- Keratoconus.
- Clinical course- burn out 5-10 yrs

Treatment

- Avoid allergen, cold sponging, vasoconstrictors like naphazoline
- NSAID- ketorolac tromethamine. Down regulate cyclooxygenase

Allergic conjunctivitis

- Lubricants – dilute allergens
- Mast cell stablisers- sod cromoglycate 2% and 4%
- Olopatadine – Dual ax 1% and 2%
- Epinastine , Azelastine and syt anti histaminic
- Ketotifen dual ax
- loteprednol 0.2%, 0.5%, Fluoromethalone
- Topical cycosporine 0.05%, 0.1%

Allergic conjunctivitis

- Treatment of papillae- supratarsal injection, cryoapplications and surgical excision.
- Keratopathy- mild steroid and antibiotic, plaque removal , AMG transplantation.

Allergic conjunctivitis

Atopic keratoconjunctivitis (AKC)- Adult equivalent of VKC and assoc with atopic dermatitis. More in adult males.

Symptoms

- Itching, mucoid discharge, dryness and blurred vision.

Signs

- Inflamed lid margins,hyperemia, papilae,SPK,plaques and thinning of cornea

Allergic conjunctivitis

- Clinical course is protracted with remission and relapse
- Association with keratoconus and cataract
- Treatment same as VKC

Allergic conjunctivitis

Giant papillary conjunctivitis- inflamation of conjunctiva with large papillae.

Etiology- localised allergic response to deposited irritant e.g CL, suture, prosthesis.

Symptoms - itching, stringy discharge, CL intolerance

Signs- large papilae >1mm and hyperemia.

Treatment – remove the cause and antiallergics

Allergic conjunctivitis

Phylctenular conjunctivitis- nodular inflamatory response of conjunctiva and corneal epithelium to some endogenous allergen.Delayed type 4 hypersenstivity to tubercular or staphylococus protein or parasites.

Predisposition- 3-15yr f, undernourished and poor living conditions

Allergic conjunctivitis

Pathology

- Stage of nodule- exudation and infilteration of leucocytes into deeper layers.
- Ulceration- necrosis at apex. Ulceration and infilt by leucocytes,mast cells and plasma cells
- Granulation – Floor covered by granulation.
- Healing – with minimal scar.

Allergic conjunctivitis

- Symptoms- irritation and watering.

Clinical forms

a) Simple phylc conj- pink white nodule which ulcerate and then heals
b) Necrotic PKC- large phylcten with necrosis and ulceration lead to pustular conj
c) Milliary – multiple phylctens.

Allergic conjunctivitis

Phylctenular keratitis

A. ulcerative

i. Sacrofulous- shallow marginal ulcer with long axix parallel to limbus.Heals with no opacity

ii. Fascicular ulcer- ulcer with parallel leash of blood vs. Heals with band shaped opacity.

iii. Milliary – multiple small ulcers

Allergic conjunctivitis

B. Diffuse infilterative keratitis- central infilteration of cornea with rich vs from limbus

Treatment - steroids and antibiotics, cycloplegics

- Treatment of cause e.g TB,tonsilitis etc
- Improve general hygiene and nutrition

Allergic conjunctivitis

Contact Dermatoconjunctivitis

- Allergic rx involv conjunctiva, skin of lids with face.
- Type 4 rx response to prolong contact with chemicals/drugs e.g atropine, pencillin, neomycin
- Eczematous rx in area of skin with hyperemia, papilae in fornix
- Steroids and antibiotics

Conjunctival Degenerations

Pinguecula

-Extremely common

-Yellowish white deposit on bulbar conjunctiva (nasal/temporal)

-Histopathology: Degn. Of collagen fibres, thinning of epithelium, calcification

Treatment

Conservative, rarely surgical

Pterygium

- Hot climate, Dryness and exposure to sun
- C/f: Conjunctival overgrowth over the cornea in triangular fashion
- Destruction of Bowman's membrane and superficial corneal lamellae

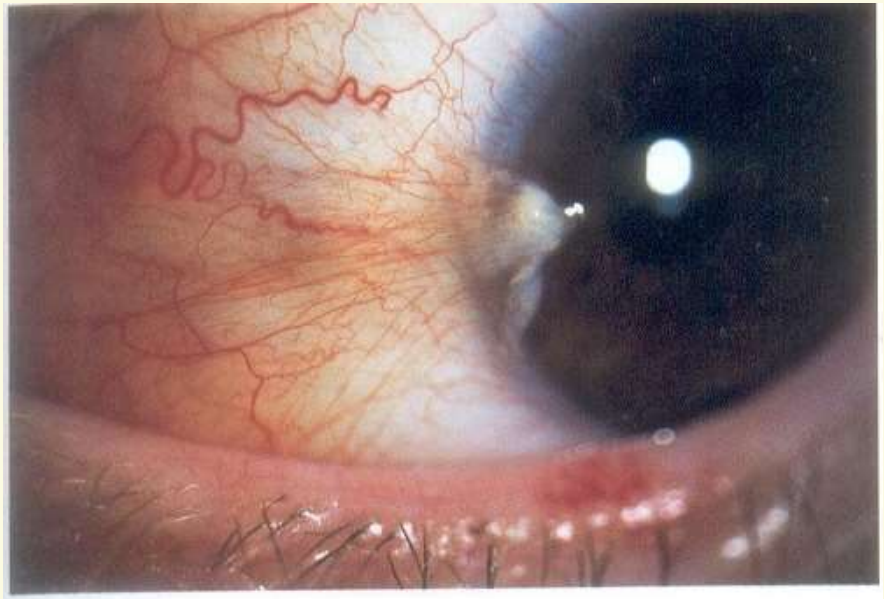


Figure 3.87 Established pterygium

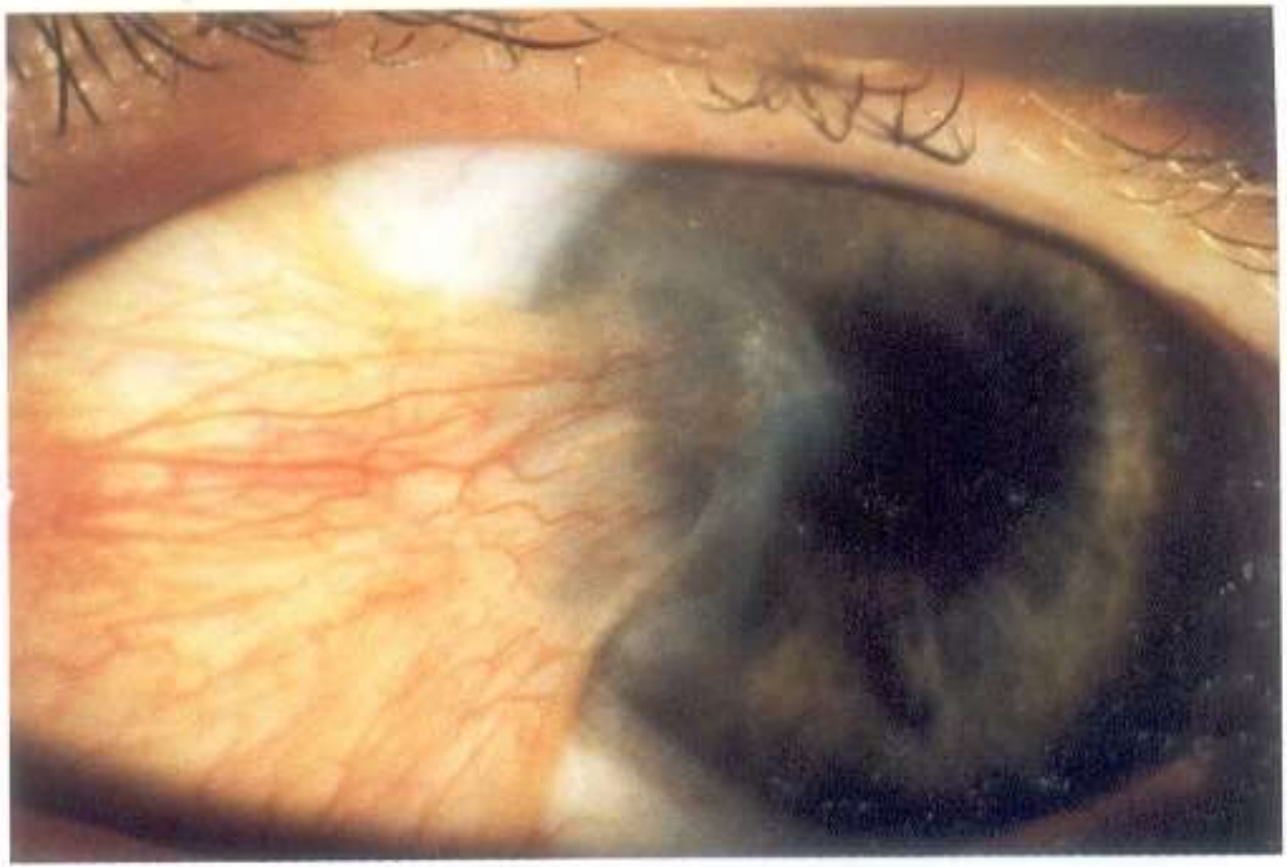


Figure 3.88 Advanced pterygium

Pterygium

- Elastotic hyaline degeneration of cornea.
- Parts- head , neck and body.

Types

- Progressive- vascular and fleshy with infilterates in front of head
- Regressive- thin atrophic,less vascular with no infilterates.

Treatment

Surgical excision

- Visual axis
- Astigmatism
- Double vision
- Cosmesis

Pterygium

- Bare sclera technique
- Mitomycin/thiotepa application
- Beta irradiation
- Auto-conjunctival grafting.

For Any Queries and Clarifications

- Contact Dr. Bhavani Raina on Saturday (21-11-2020), between 01:00 PM to 03:00 PM in Seminar Room of EYE Department.