

# Ophthalmology Block

## The Red Eye

MBChB IV  
2012

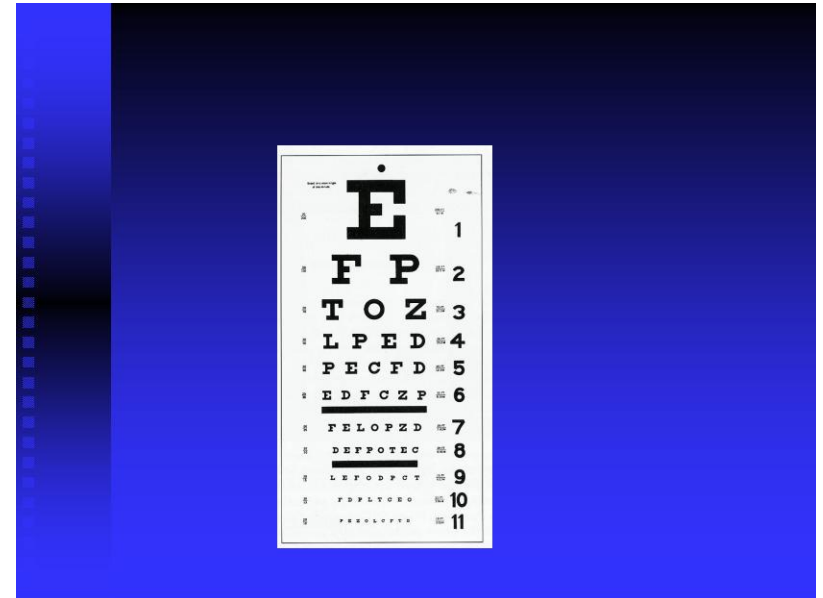
Prof Polla Roux

# ETIOLOGY

- Conjunctivitis
- Blepharitis
- Pterygium
- Keratoconjunctivitis sicca
- Abrasion & FB
- Subconjunctival haemorrhage
- Thyroid Eye Disease
- Herpes simplex keratitis
- Iritis
- Episcleritis
- Acute angle closure glaucoma
- Abnormal lid function
- Conjunctival ca

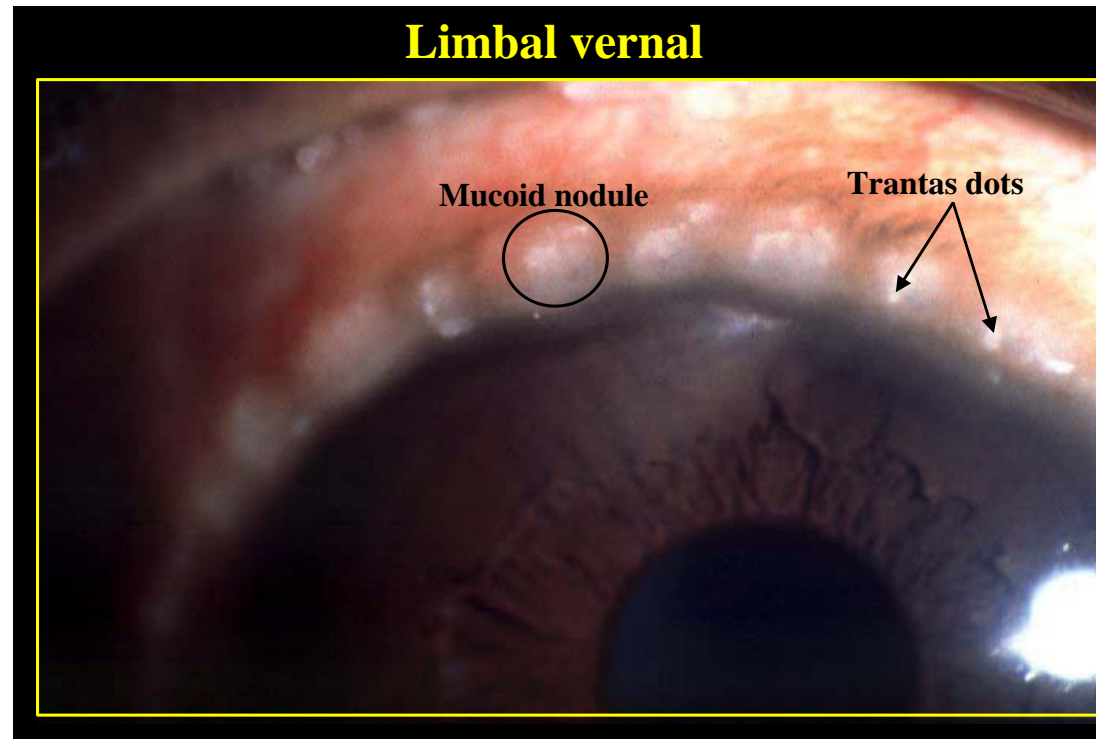
# DIAGNOSTIC STEP 1

- Visual acuity testing
  - R eye then L eye



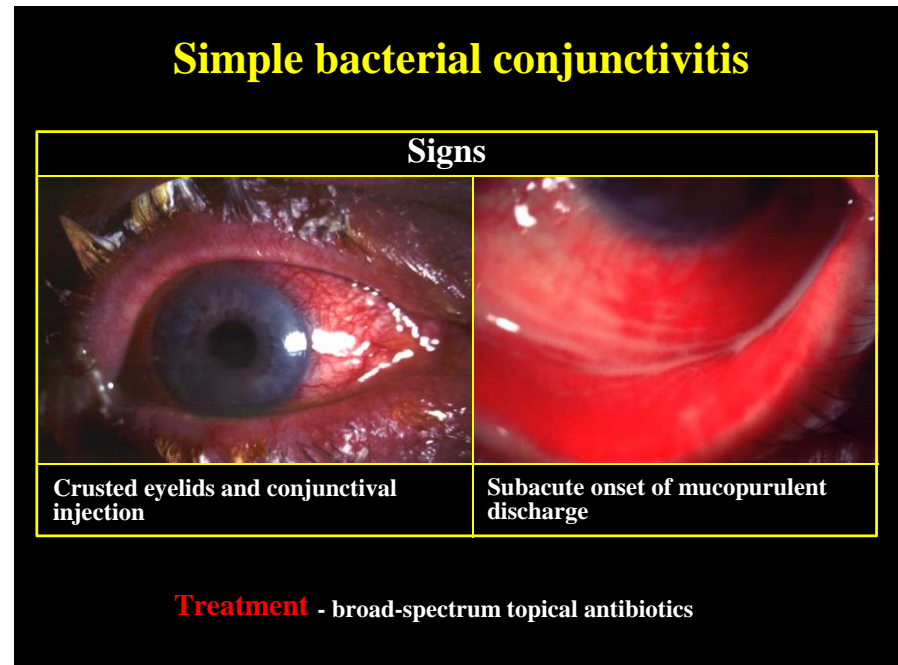
# DIAGNOSTIC STEP 2

- Type of redness
  - Diffuse
  - Subconjunctival haemorrhage
  - Ciliary flush
  - Focal



# DIAGNOSTIC STEP 3

- Type of discharge
  - Watery (serous)
  - Purulent
  - Mucopurulent



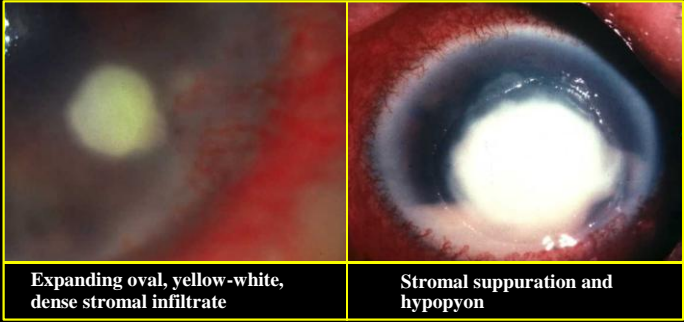
# DIAGNOSTIC STEP 4

- Detect cornea opacities
  - Irregular surface
  - Leucoma
  - Ulcer
  - Keratic precipitates

**Bacterial keratitis**

**Predisposing factors**

- Contact lens wear
- Chronic ocular surface disease
- Corneal hypoaesthesia



Expanding oval, yellow-white, dense stromal infiltrate

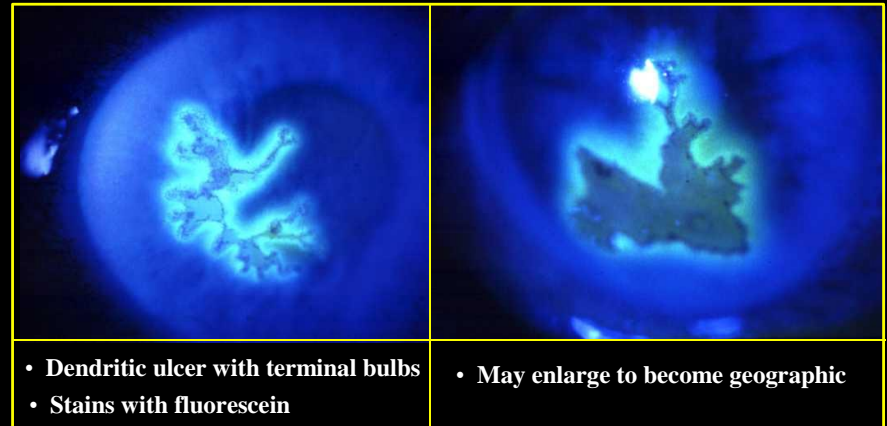
Stromal suppuration and hypopyon

**Treatment** - topical ciprofloxacin 0.3% or ofloxacin 0.3%

# DIAGNOSTIC STEP 5

- Stain tear film with fluorescein
  - Look for disruption of epithelium

## Herpes simplex epithelial keratitis



### Treatment

- Aciclovir 3% ointment x 5 daily
- Trifluorothymidine 1% drops 2-hourly
- Debridement if non-compliant

# DIAGNOSTIC STEP 6

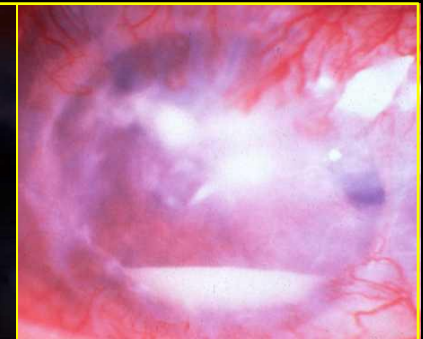
- Examine AC
  - Depth
  - Hypopion (puss)
  - Hyphema (blood)

## Fungal keratitis

Frequently preceded by ocular trauma with organic matter



Greyish-white ulcer which may be surrounded by feathery infiltrates



Slow progression and occasionally hypopyon

### Treatment

- Topical antifungal agents
- Systemic therapy if severe
- Penetrating keratoplasty if unresponsive

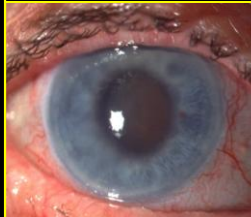
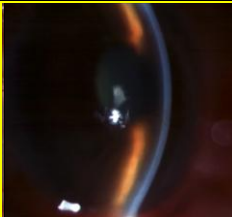
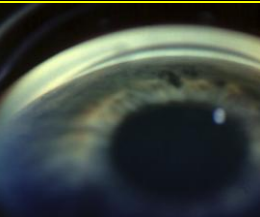


# DIAGNOSTIC STEP 7

- Pupil reactions
  - AACG

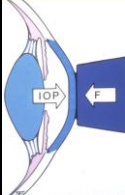





**Acute congestive angle-closure glaucoma**

**Signs**

		
<ul style="list-style-type: none"><li>· Severe corneal oedema</li><li>· Dilated, unreactive, vertically oval pupil</li></ul>	<ul style="list-style-type: none"><li>· Ciliary injection</li><li>· Shallow anterior chamber</li></ul>	<ul style="list-style-type: none"><li>· Complete angle closure (Shaffer grade 0)</li></ul>

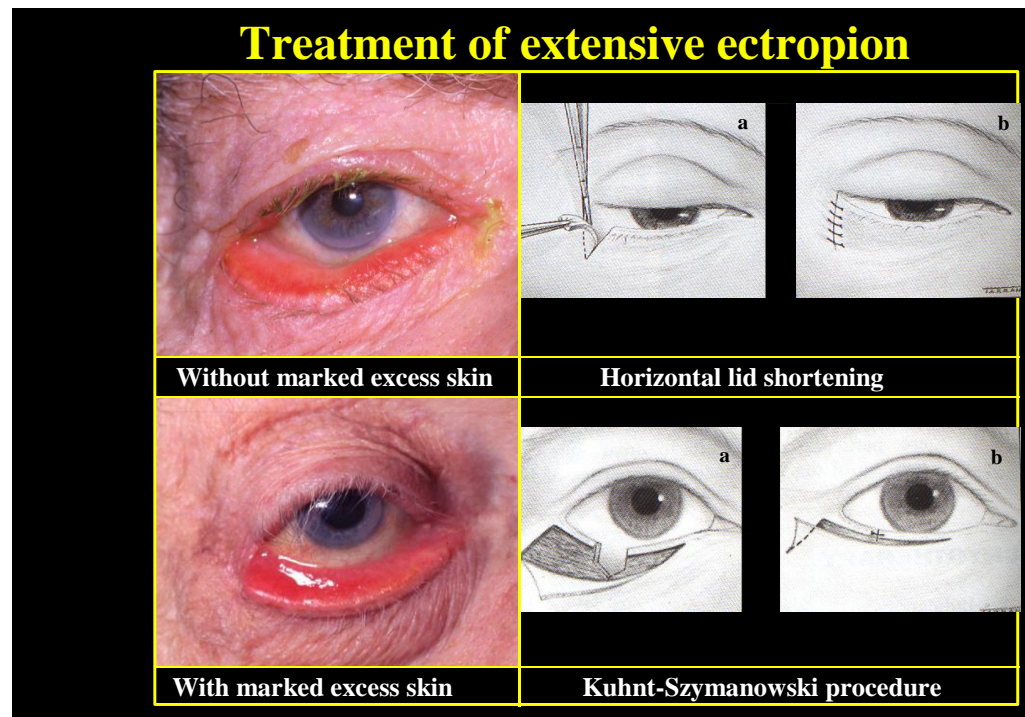
# DIAGNOSTIC STEP 8

- IOP
  - Schiottz tonometry
    - AACG
  - Applanation tonometry
  - Puff tonometry

<b>Tonometers</b>		
		
<b>Goldmann</b> Contact applanation	<b>Perkins</b> Portable contact applanation	<b>Schiottz</b> Contact indentation
		
<b>Air-puff</b> Non-contact indentation	<b>Pulsair 2000 (Keeler)</b> Portable non-contact applanation	<b>Tono-Pen</b> portable contact applanation

# DIAGNOSTIC STEP 9

- Orbit examination
  - TED
- Lid abnormality
  - Blepharitis
  - Hordeolum
  - Ectropion
  - Entropion
  - Trachoma



# ETIOLOGY

- Conjunctivitis
- Blepharitis
- Pingueculum
- Keratoconjunctivitis sicca
- Abrasion & FB
- Pterygium
- Subconjunctival haemorrhage
- Herpes simplex keratitis
- Iritis
- Episcleritis
- Acute angle closure glaucoma
- Abnormal lid function
- Conjunctival ca

# **CONJUNCTIVAL INFECTIONS**

## **1. Bacterial**

- **Simple bacterial conjunctivitis**
- **Gonococcal keratoconjunctivitis**

## **2. Viral**

- **Adenoviral keratoconjunctivitis**
- **Molluscum contagiosum conjunctivitis**
- **Herpes simplex conjunctivitis**

## **3. Chlamydial**

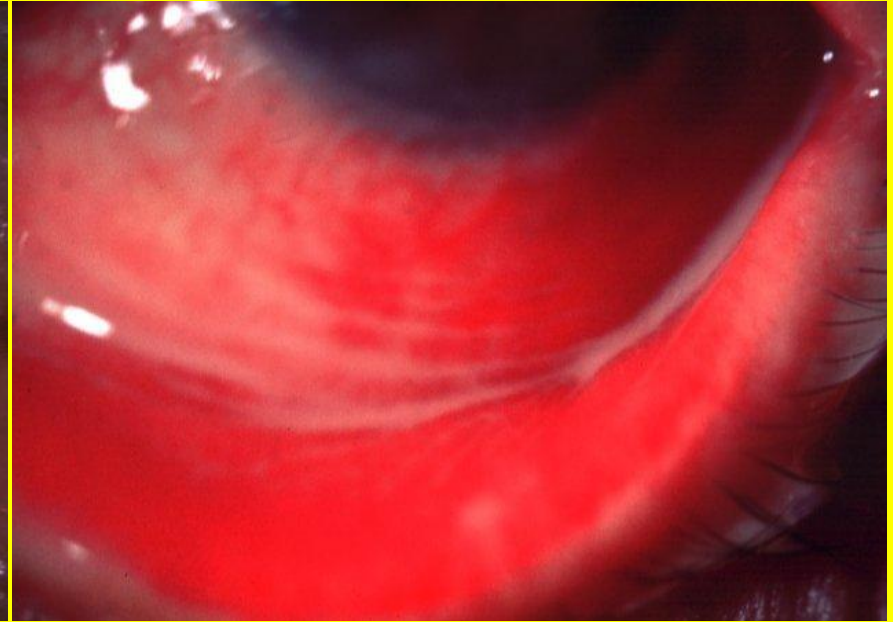
- **Adult chlamydial keratoconjunctivitis**
- **Neonatal chlamydial conjunctivitis**
- **Trachoma**

# Simple bacterial conjunctivitis

## Signs



**Crusted eyelids and conjunctival injection**



**Subacute onset of mucopurulent discharge**

**Treatment - broad-spectrum topical antibiotics**

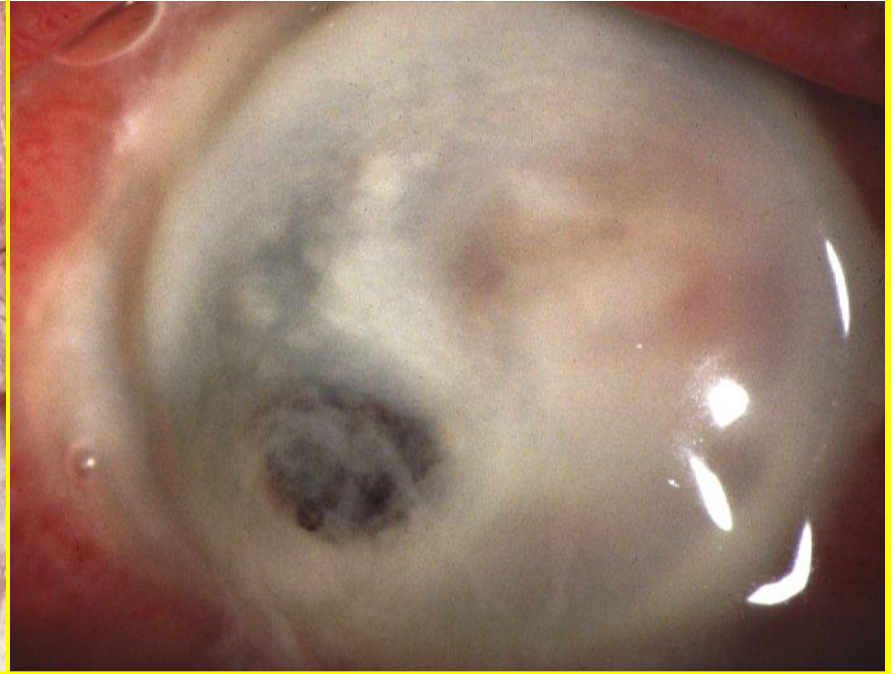
# Gonococcal keratoconjunctivitis

## Signs



**Acute, profuse, purulent discharge, hyperaemia and chemosis**

## Complications



**Corneal ulceration, perforation and endophthalmitis if severe**

## Treatment

- **Topical gentamicin and bacitracin**
- **Intravenous cefoxitin or cefotaxime**

# **Adenoviral Keratoconjunctivitis**

## **1. Pharyngoconjunctival fever**

- Adenovirus types 3 and 7**
- Typically affects children**
- Upper respiratory tract infection**
- Keratitis in 30% - usually mild**

## **2. Epidemic keratoconjunctivitis**

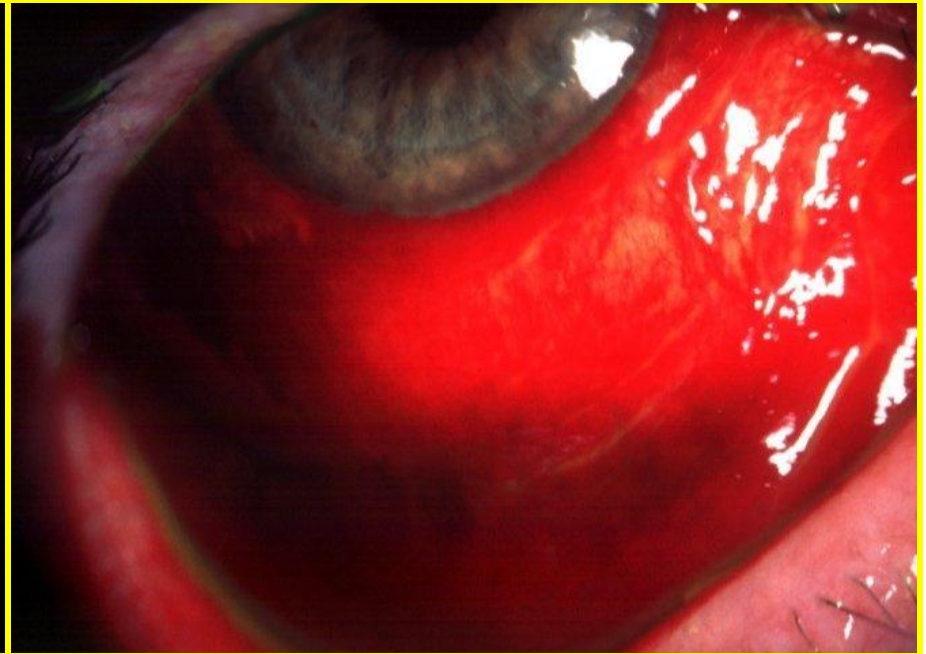
- Adenovirus types 8 and 19**
- Very contagious**
- No systemic symptoms**
- Keratitis in 80% of cases - may be severe**



# Signs of conjunctivitis



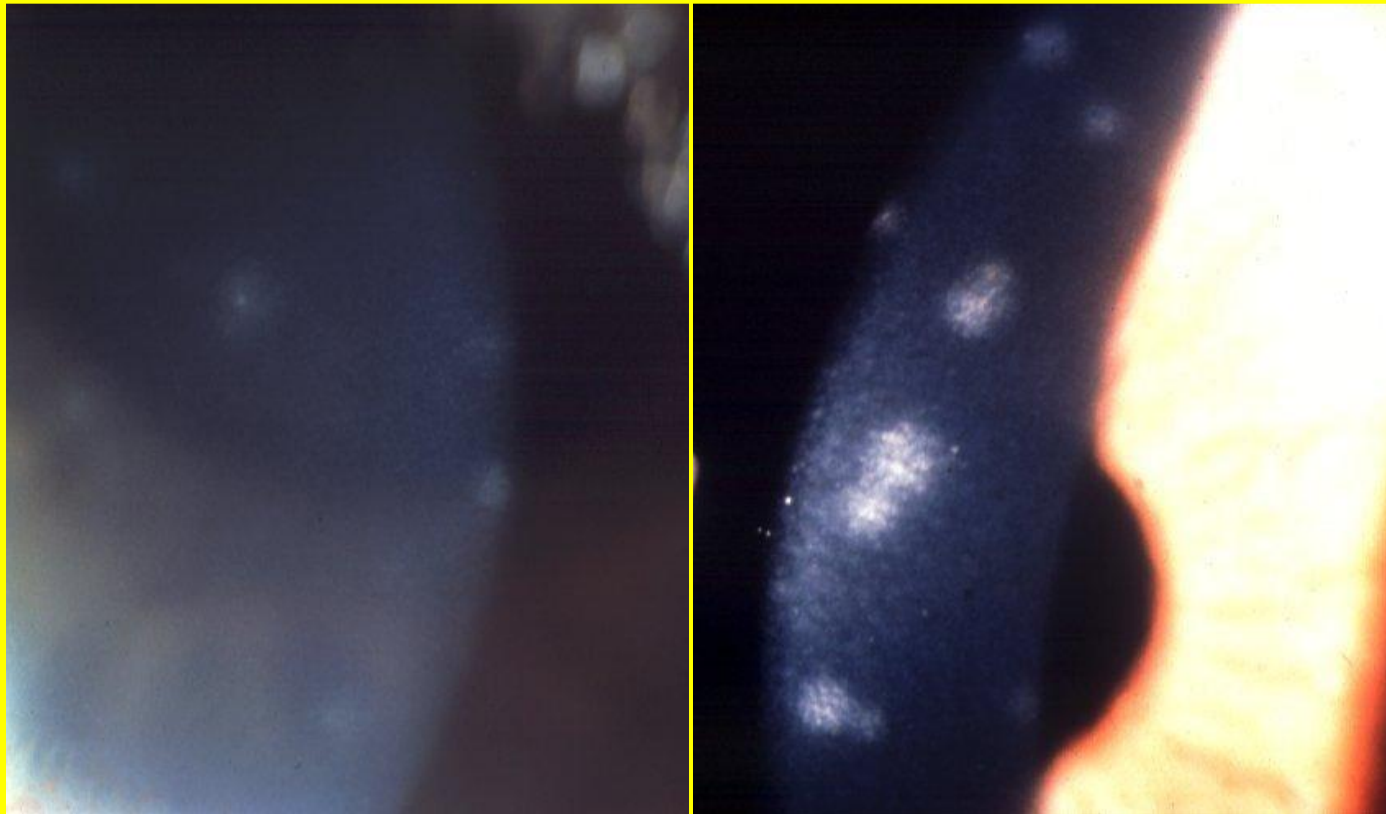
**Usually bilateral, acute watery discharge and follicles**



**Subconjunctival haemorrhages and pseudomembranes if severe**

**Treatment - symptomatic**

# Signs of keratitis



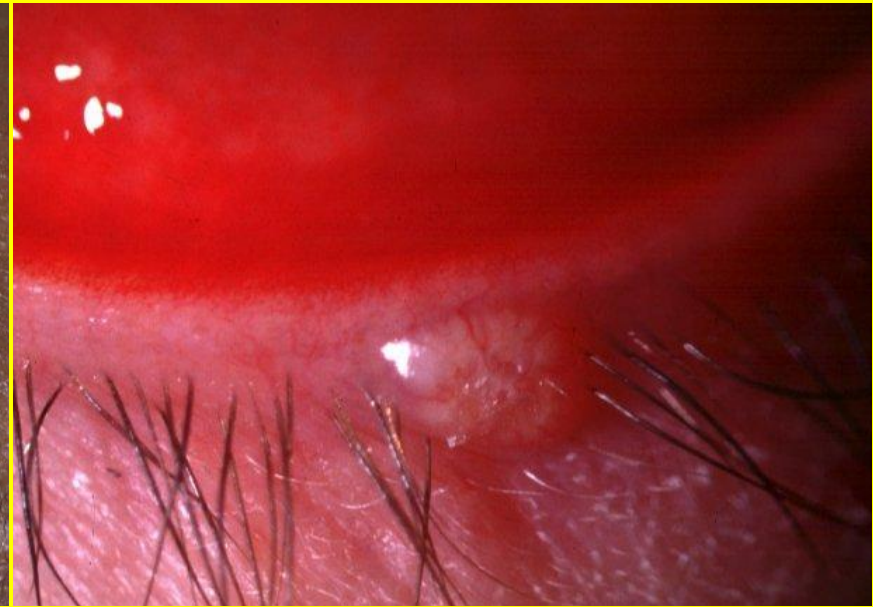
- Focal, epithelial keratitis
- Transient

- Focal, subepithelial keratitis
- May persist for months

**Treatment** - topical steroids if visual acuity diminished by subepithelial keratitis

# Molluscum contagiosum conjunctivitis

## Signs



- **Waxy, umbilicated eyelid nodule**
- **May be multiple**

- **Ipsilateral, chronic, mucoid discharge**
- **Follicular conjunctivitis**

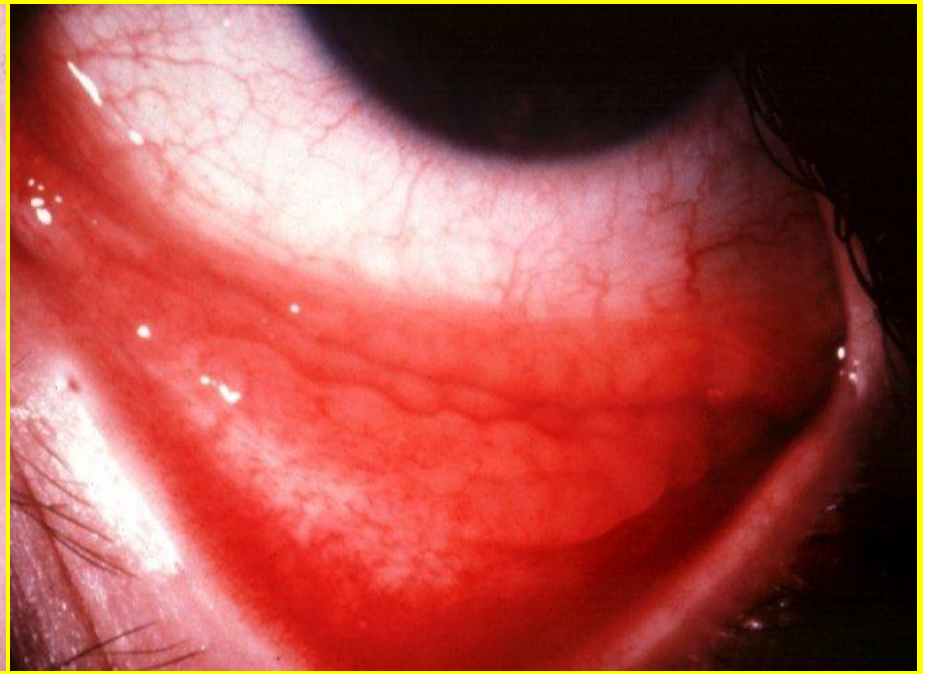
**Treatment - destruction of eyelid lesion**

# Herpes simplex conjunctivitis

## Signs



**Unilateral eyelid vesicles**

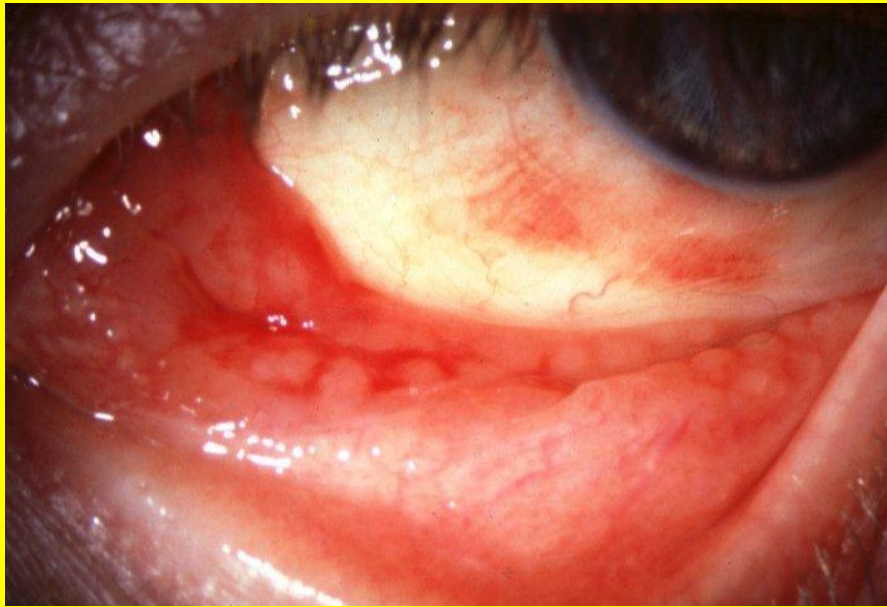


**Acute follicular conjunctivitis**

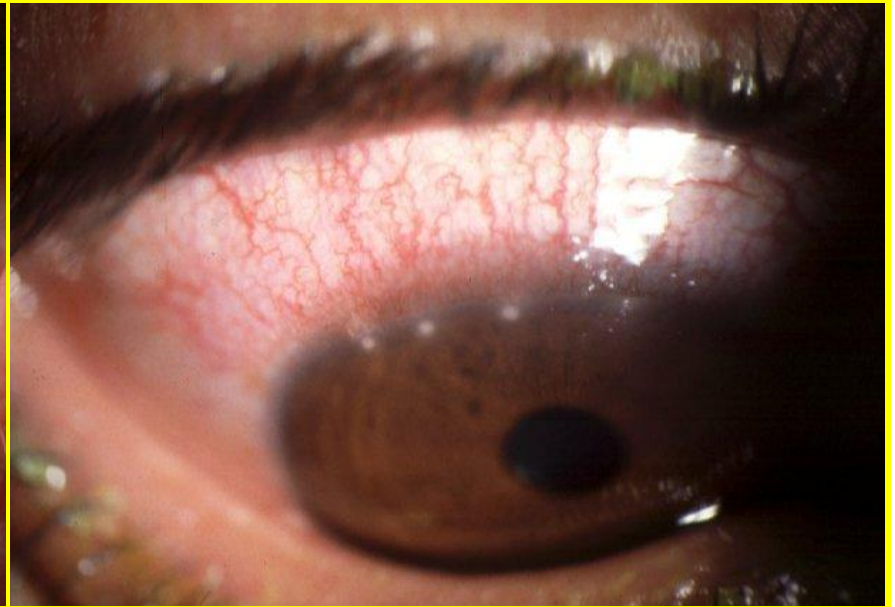
**Treatment - topical antivirals to prevent keratitis**

# Adult chlamydial keratoconjunctivitis

- Infection with *Chlamydia trachomatis* serotypes D to K
- Concomitant genital infection is common



**Subacute, mucopurulent follicular conjunctivitis**



**Variable peripheral keratitis**

**Treatment - topical tetracycline and oral tetracycline or erythromycin**

# Neonatal chlamydial conjunctivitis

- **Presents between 5 and 19 days after birth**
- **May be associated with otitis, rhinitis and pneumonitis**



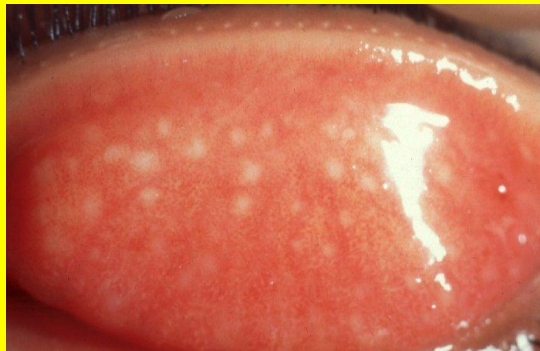
**Mucopurulent papillary conjunctivitis**

**Treatment - topical tetracycline and oral erythromycin**

# Trachoma

- Infection with serotypes A, B, Ba and C of *Chlamydia trachomatis*
- Fly is major vector in infection-reinfection cycle

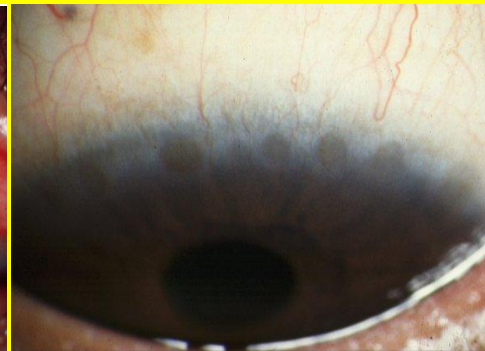
## Progression



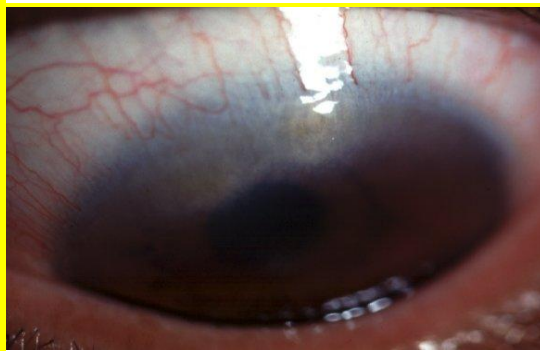
**Acute follicular conjunctivitis**



**Conjunctival scarring (Arlt line)**



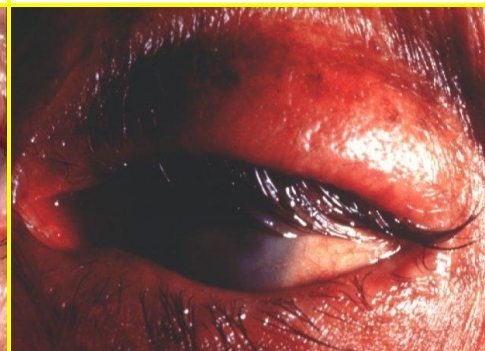
**Herbert pits**



**Pannus formation**



**Trichiasis**



**Cicatricial entropion**

**Treatment - systemic azithromycin**

# **ALLERGIC CONJUNCTIVITIS**

- 1. Allergic rhinoconjunctivitis**
- 2. Vernal keratoconjunctivitis**
- 3. Atopic keratoconjunctivitis**



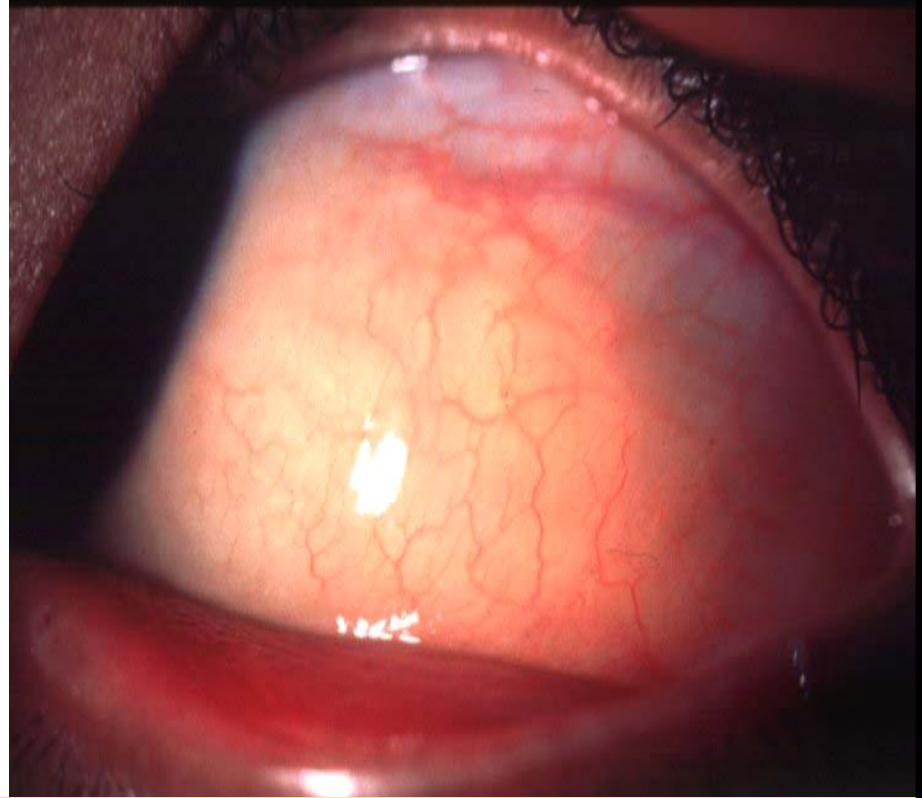
# Allergic rhinoconjunctivitis

- Hypersensitivity reaction to specific airborne antigens
- Frequently associated nasal symptoms

**May be seasonal or perennial**



**Transient eyelid oedema**



**Transient conjunctival oedema**

# Vernal keratoconjunctivitis

**Frequently associated with atopy: asthma, hay fever and dermatitis**



- **Recurrent, bilateral**
- **Affects children and young adults**
- **More common in males and in warm climates**
- **Itching, mucoid discharge and lacrimation**

## **Types**

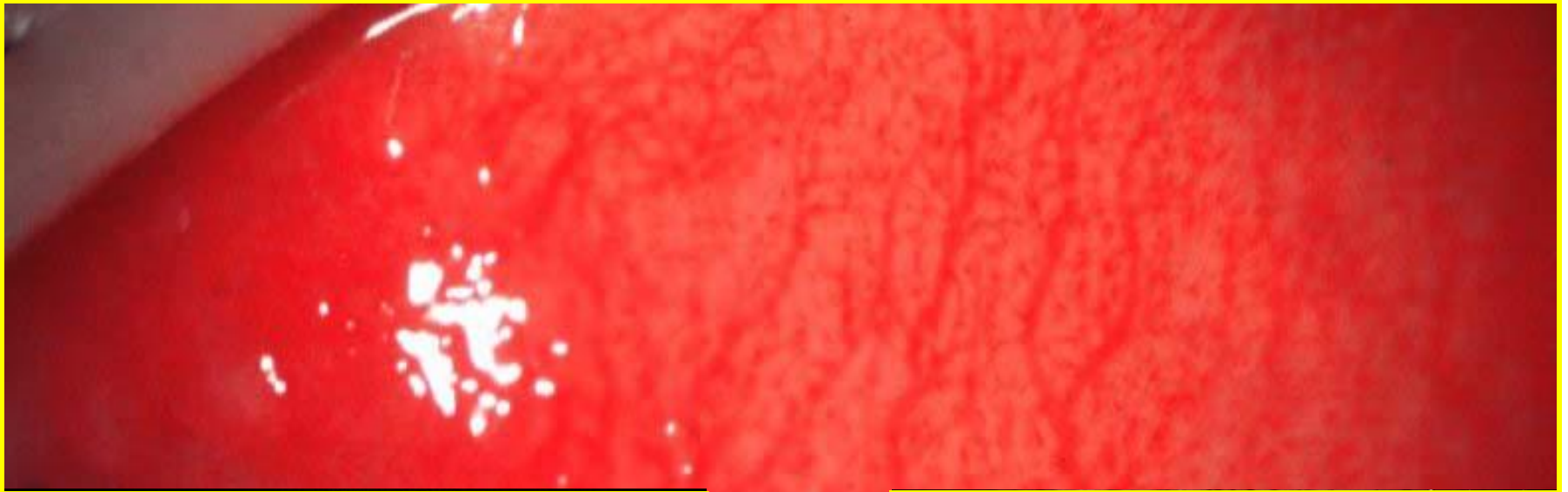
- **Palpebral**
- **Limbal**
- **Mixed**

## **Treatment**

- **Topical mast cell stabilizers**
- **Topical steroids**

# Progression of vernal conjunctivitis

Diffuse papillary hypertrophy, most marked on superior tars



Formation of cobblestone papillae



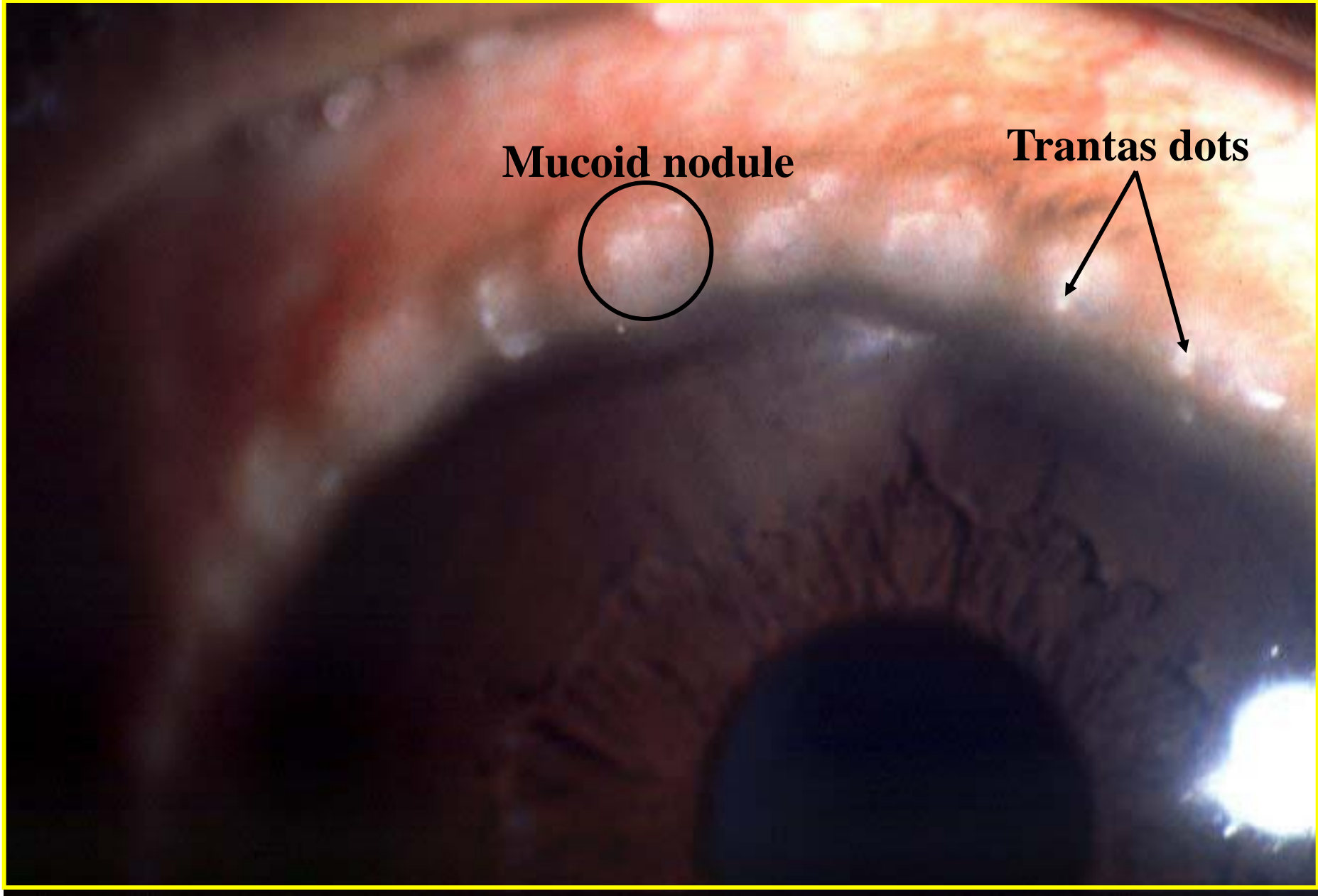
Rupture of septae - giant papillae

# Limbal vernal

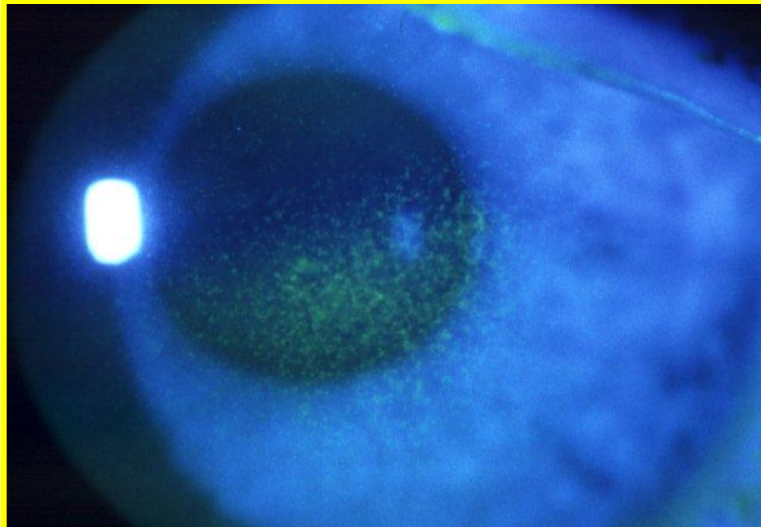
Mucoid nodule



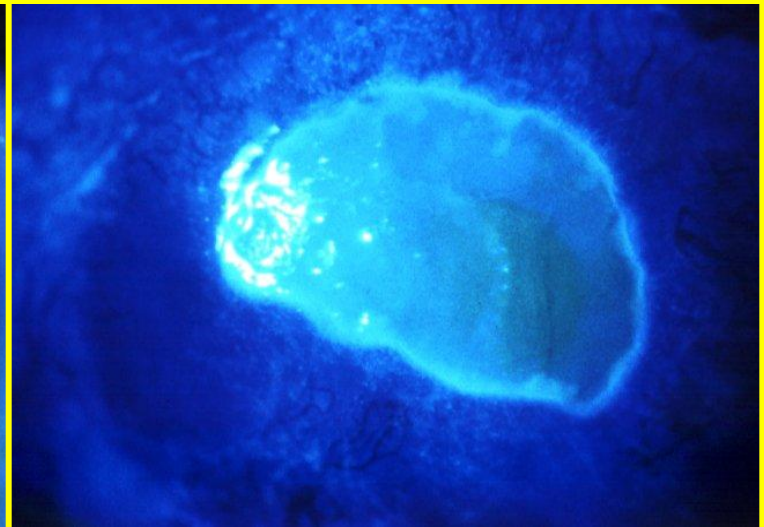
Trantas dots



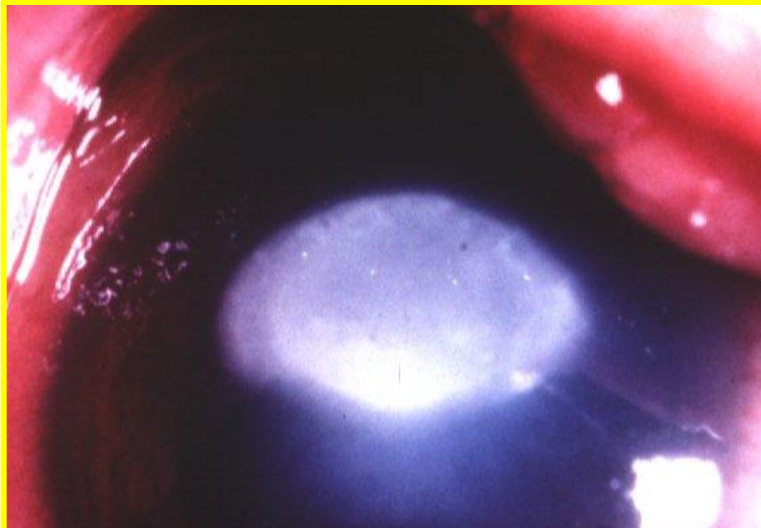
# Progression of vernal keratopathy



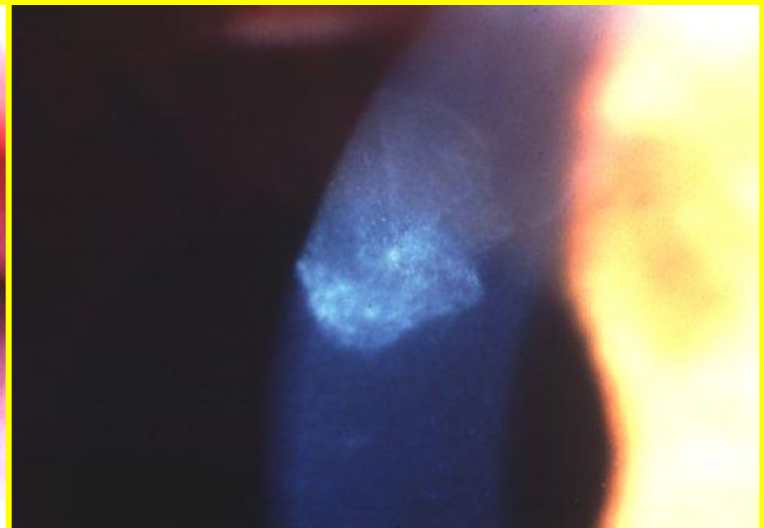
**Punctate epitheliopathy**



**Epithelial macroerosions**



**Plaque formation (shield ulcer)**



**Subepithelial scarring**

# Atopic keratoconjunctivitis



**Typically affects young patients with atopic dermatitis**



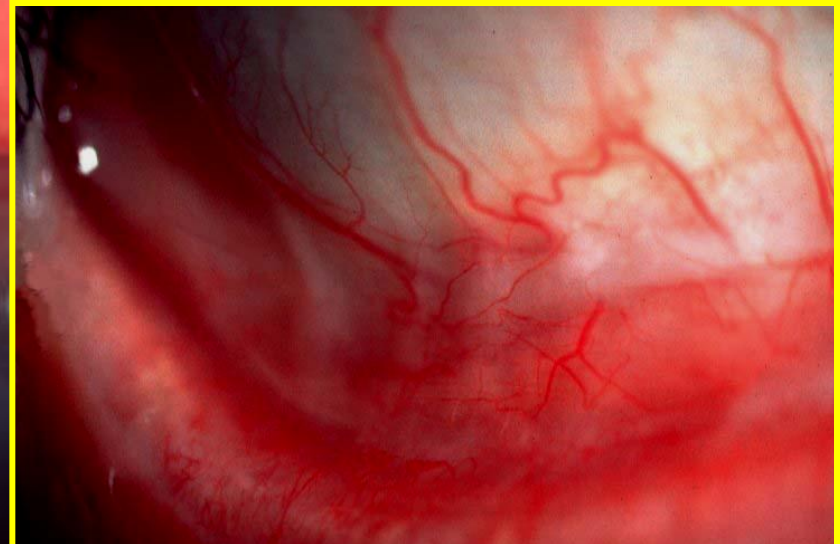
**Eyelids are red, thickened, macerated and fissured**

# Progression of atopic conjunctivitis

Infiltration of tarsal conjunctiva causing featureless appearance

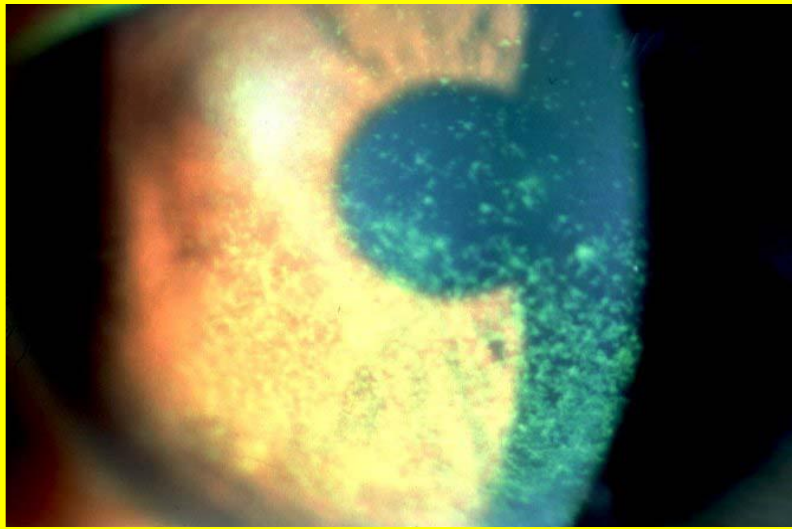


**Inferior forniceal papillae**

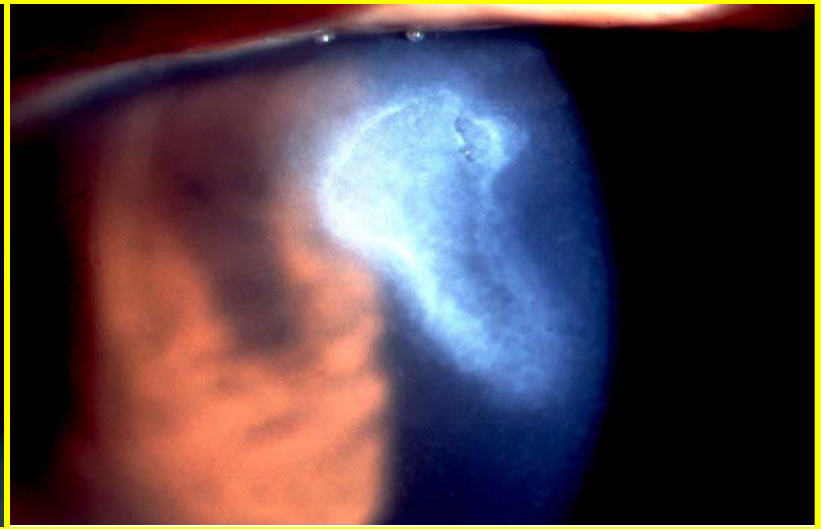


**Mild symblepharon formation**

# Progression of atopic keratopathy



**Punctate epitheliopathy**



**Persistent epithelial defects**



**Subepithelial scarring**



**Peripheral vascularization**



# **CHRONIC MARGINAL BLEPHARITIS**

## **1. Anterior**

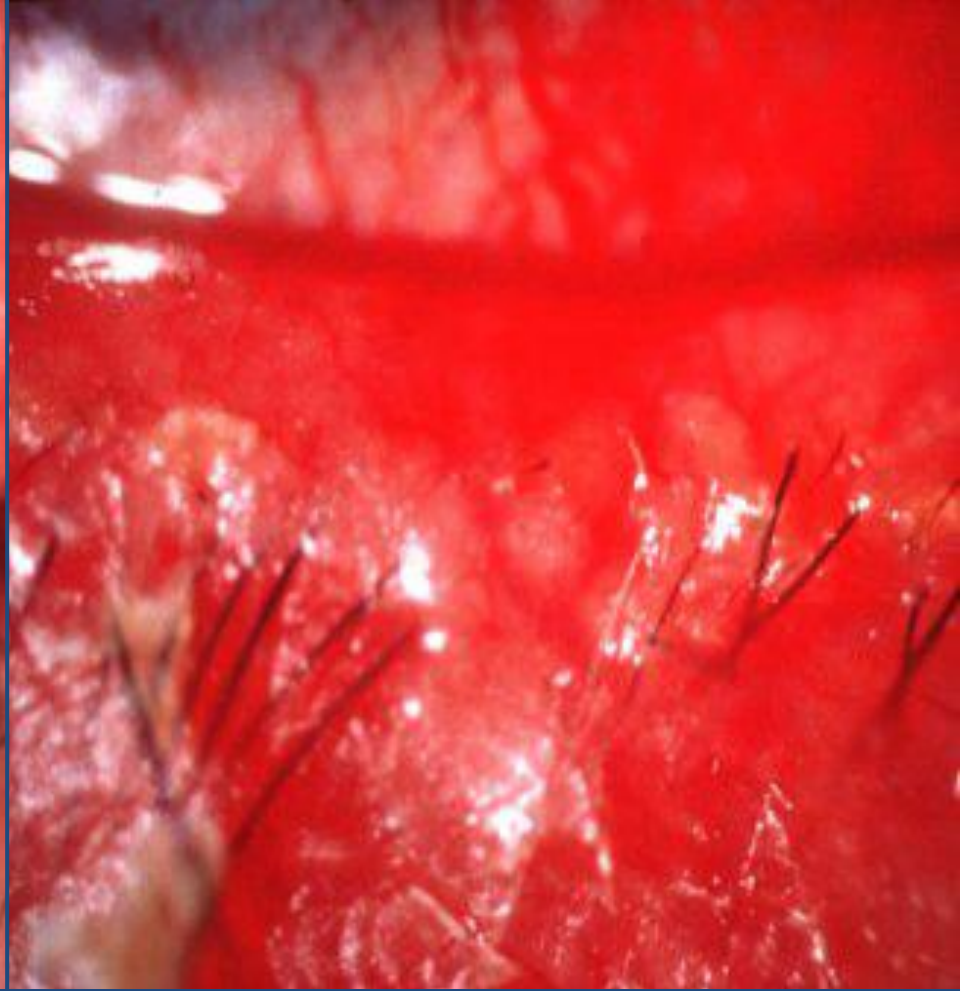
- **Staphylococcal**
- **Seborrhoeic**

## **2. Posterior**

- **Meibomianitis**
- **Meibomian seborrhoea**

## **3. Treatment**

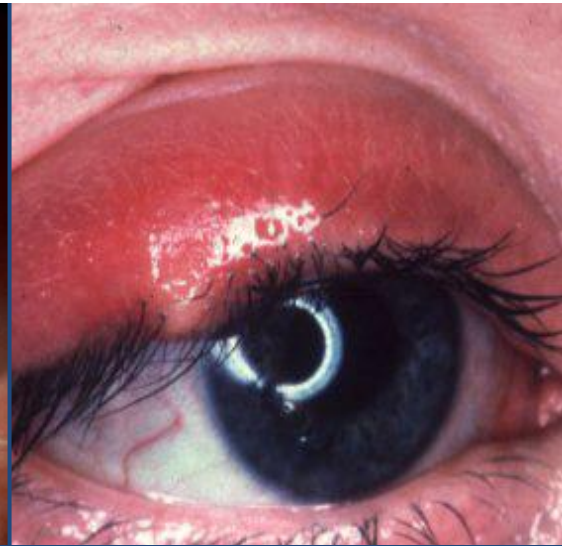
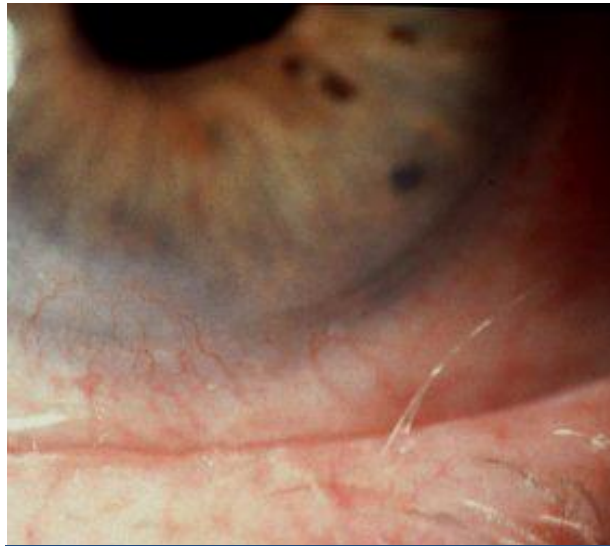
# Staphylococcal blepharitis



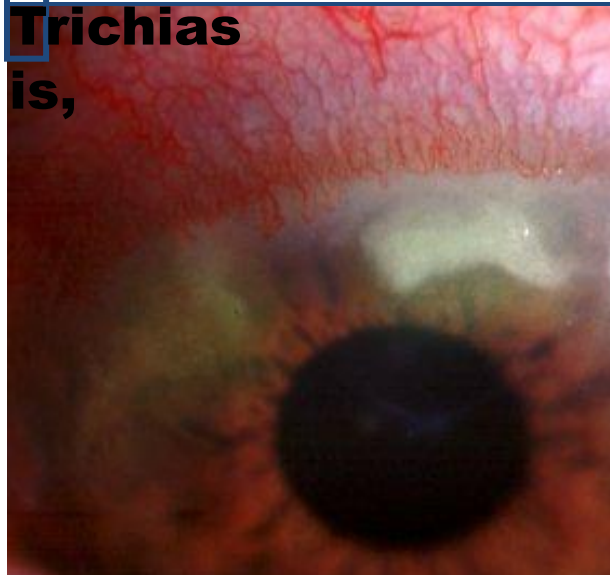
- **Chronic irritation worse in mornings**
- **Scales around base of lashes (collarettes)**

- **Hyperaemia and telangiectasia of anterior lid margin**
- **Scarring and hypertrophy if longstanding**

# Complications of staphylococcal blepharitis



Trichiasis, madarosis, poliosis Recurrent styes

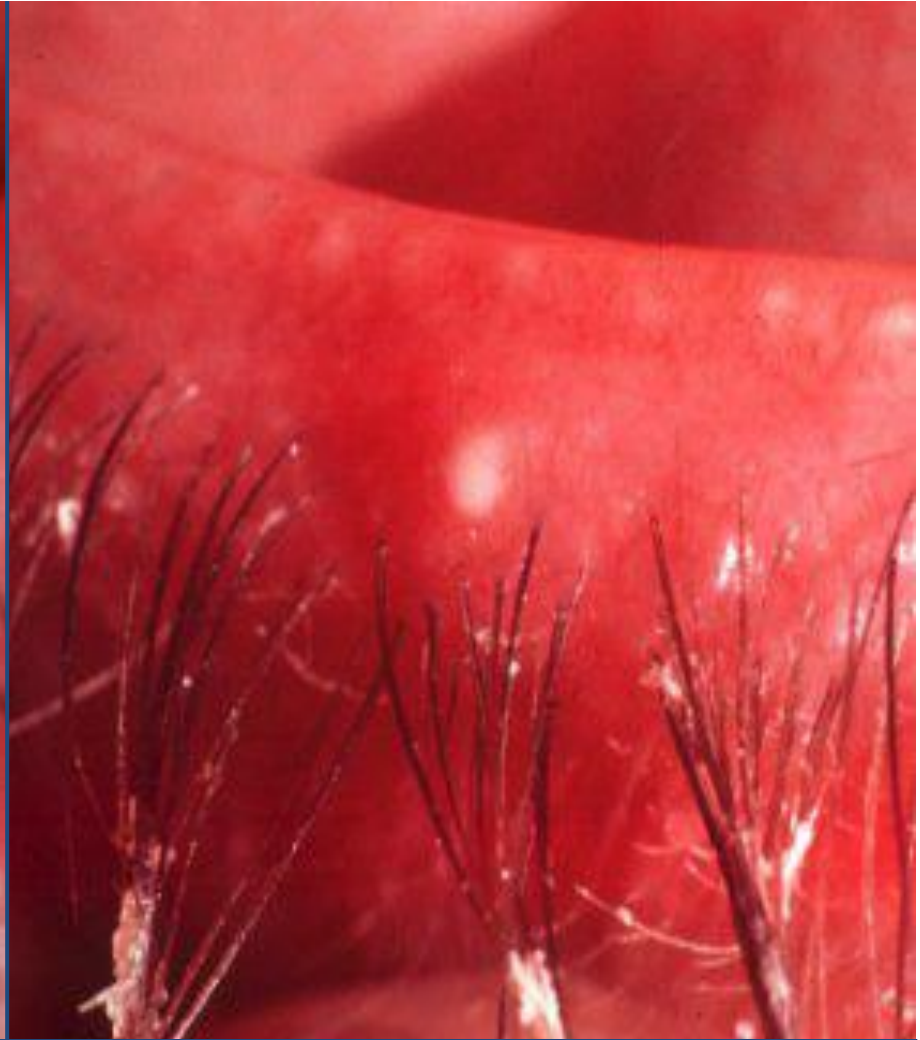


Marginal keratitis Tear film instability

# Seborrhoeic blepharitis

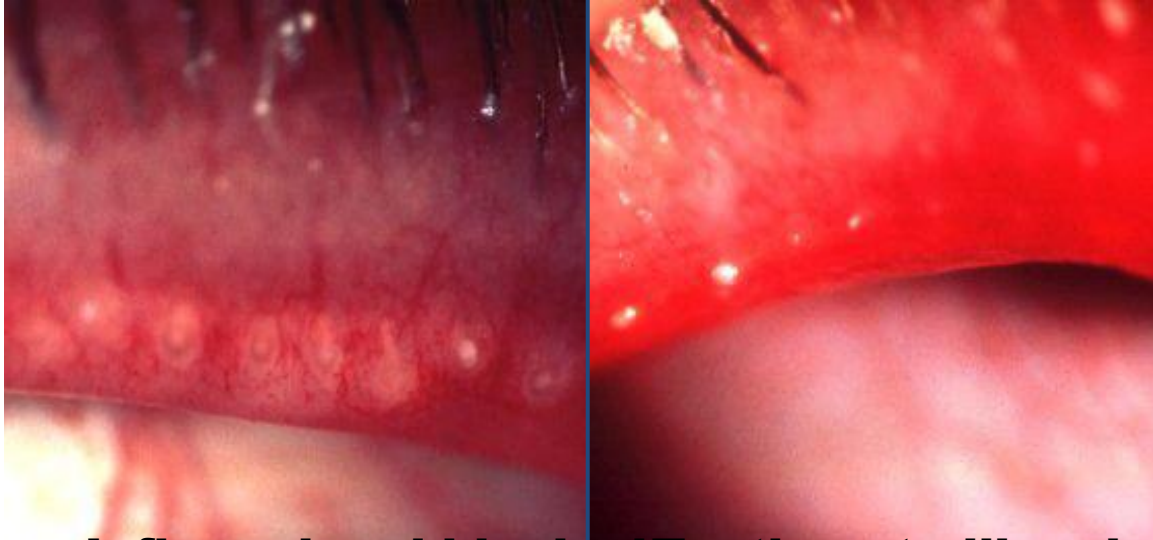


- **Shiny anterior lid margin**
- **Hyperaemia of lid margin**



- **Greasy scales**
- **Lashes stuck together**

# Meibomianitis



**Inflamed and blocked meibomian gland orifices**  
**Toothpaste-like plaques on meibomian glands**



**Thickened posterior lid margin**

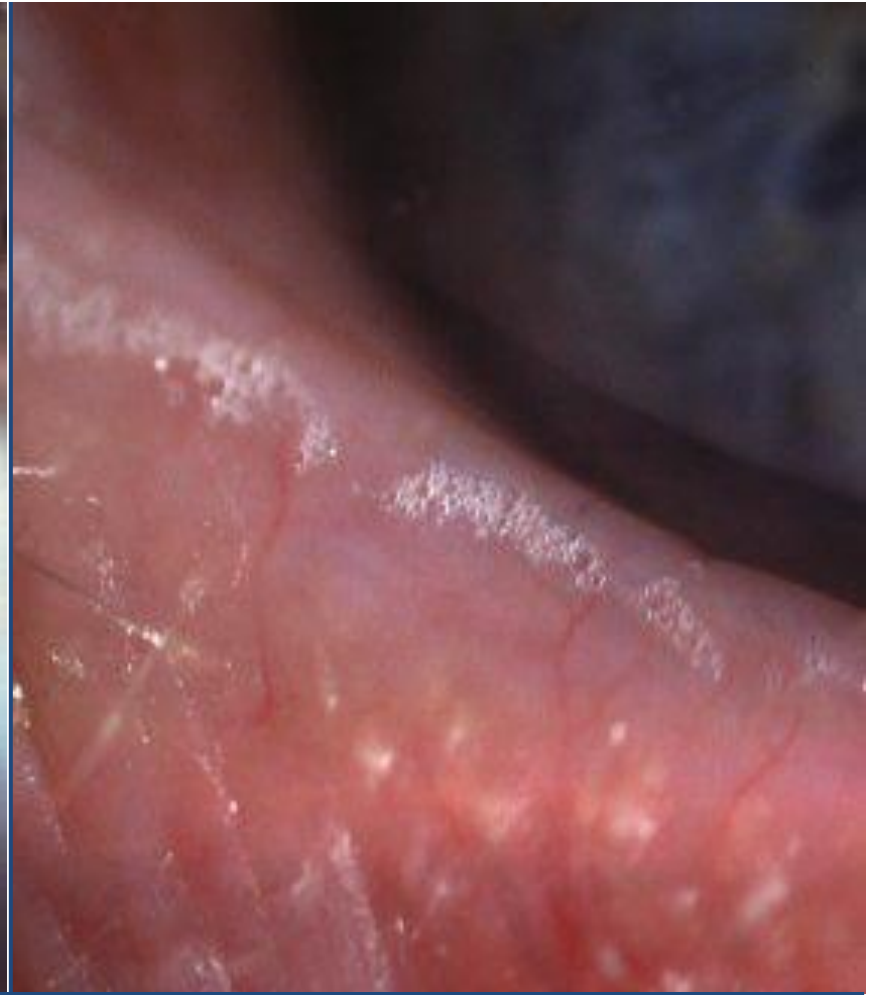


**Meibomian cyst formation**

# Meibomian seborrhoea



**Oil globules over meibomian gland orifices**



**Oily and foamy tear film**

# **Treatment of Chronic Blepharitis**

- 1. Lid hygiene - with 25% baby shampoo**
- 2. Tear substitutes - for associated tear film instability**
- 3. Systemic tetracyclines - for severe posterior blepharitis**
- 4. Warm compresses - to melt solidified sebum in posterior blepharitis**

# **MALIGNANT EYELID TUMOURS**

- 1. Basal cell carcinoma**
- 2. Squamous cell carcinoma**
- 3. Meibomian gland carcinoma**
- 4. Melanoma**
- 5. Kaposi sarcoma**
- 6. Merkel cell carcinoma**
- 7. Treatment**



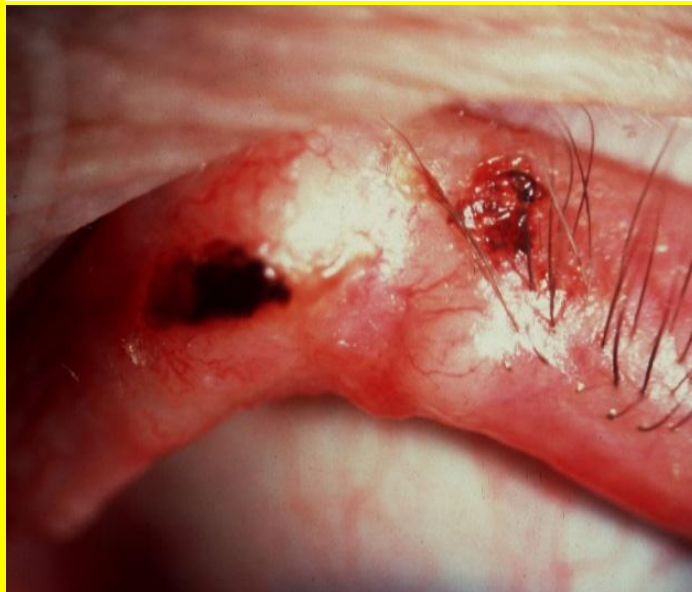
# Frequency of location of basal cell carcinoma



**Lower lid - 70%**



**Medial canthus - 15%**



**Upper lid - 10%**



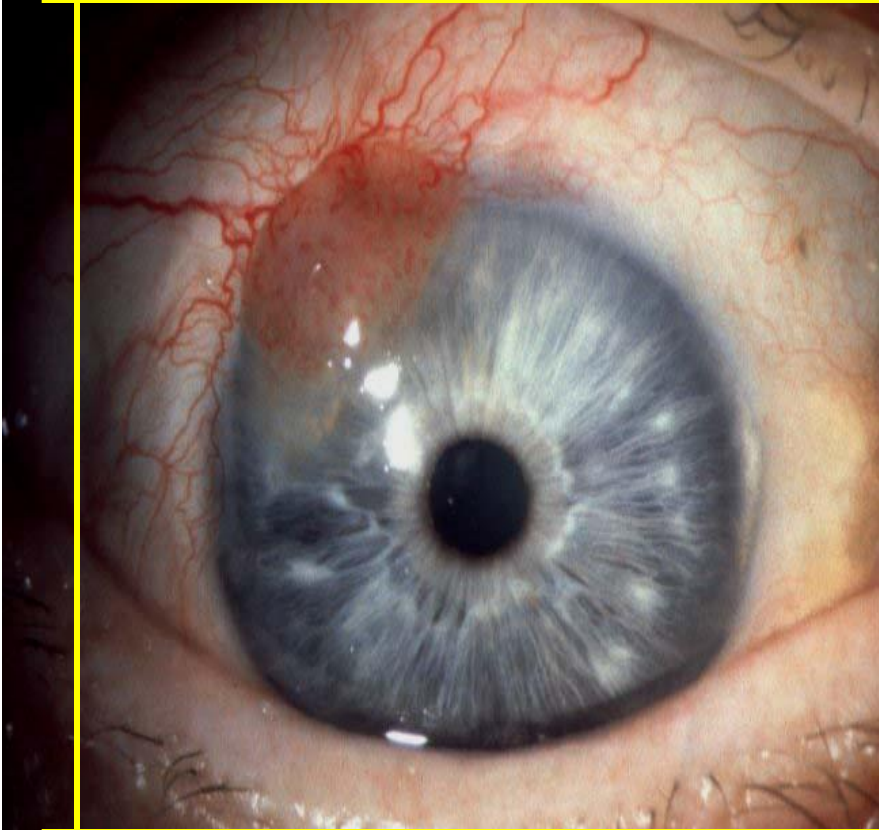
**Lateral canthus - 5%**

# **Basal Cell Carcinoma - Important Facts**

- 1. Most common human malignancy**
- 2. Usually affects the elderly**
- 3. Slow-growing, locally invasive**
- 4. Does not metastasize**
- 5. 90% occur on head and neck**
- 6. Of these 10% involve eyelids**
- 7. Accounts for 90% of eyelid malignancies**

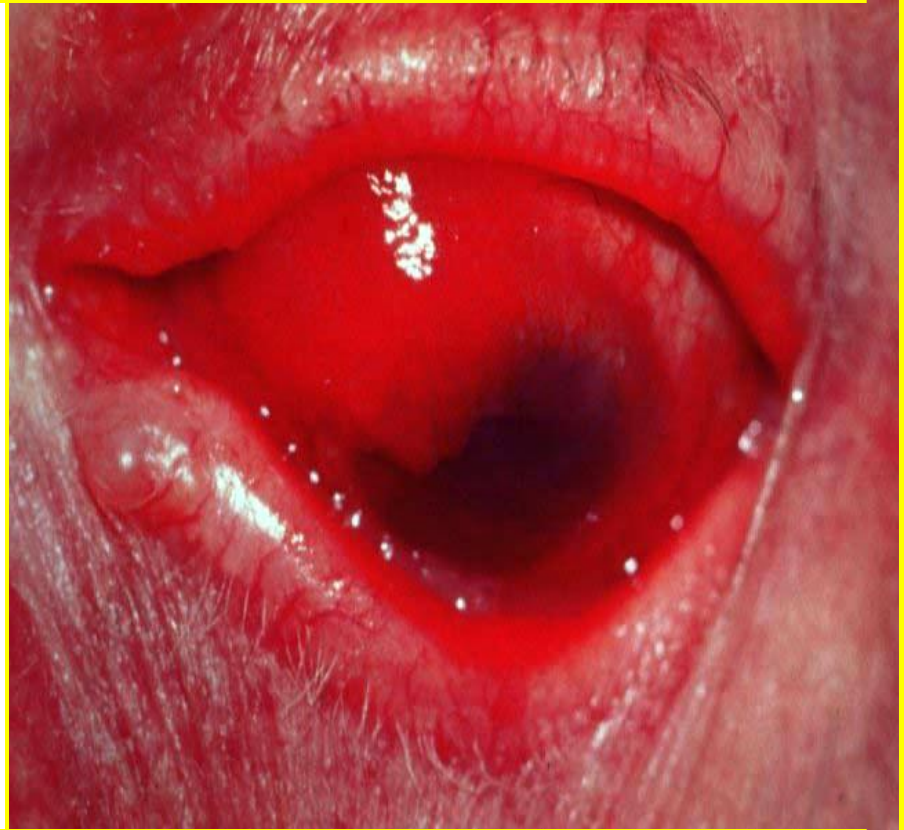
# Squamous cell carcinoma

## Signs



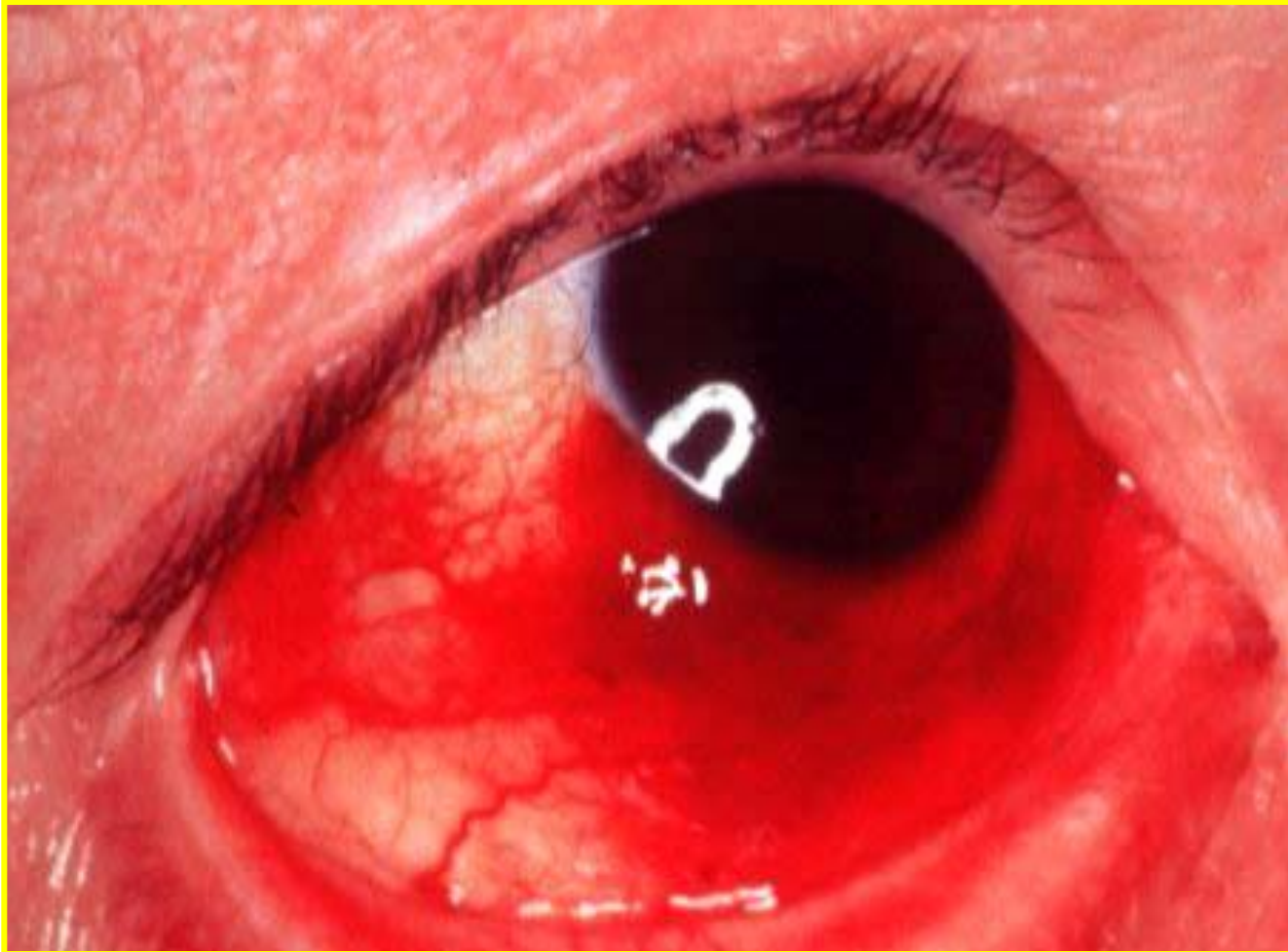
- **Arises from intraepithelial neoplasia or *de novo***
- **Presents in late adulthood**
- **Frequently juxtalimbal**

## Progression



- **Slow-growing**
- **May spread extensively**
- **Rarely metastasizes**

# Kaposi sarcoma

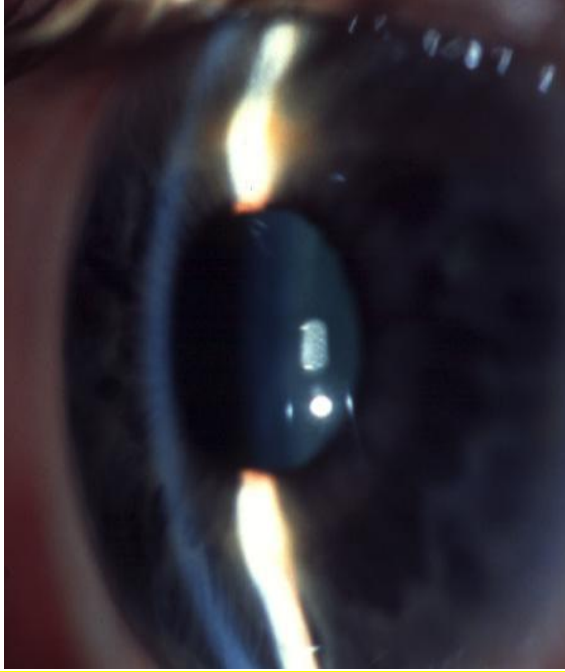


- **Affects patients with AIDS**
- **Vascular, slow-growing tumour of low malignancy**
- **Very sensitive to radiotherapy**
- **Most frequently in inferior fornix**

# **PRIMARY ANGLE-CLOSURE GLAUCOMA**

- 1. Pathogenesis**
- 2. Classification**
- 3. Intermittent**
- 4. Acute congestive**
- 5. Post congestive**
- 6. Chronic**

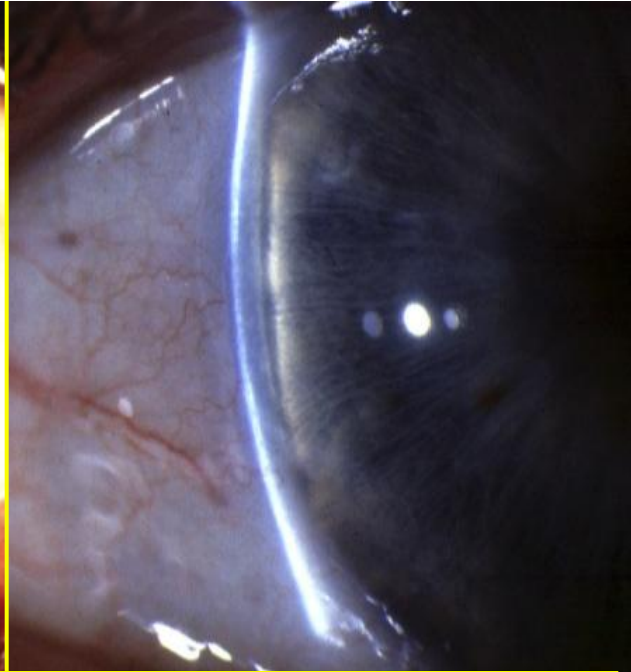
# Anatomical predispositions



- **Convex iris-lens diaphragm**

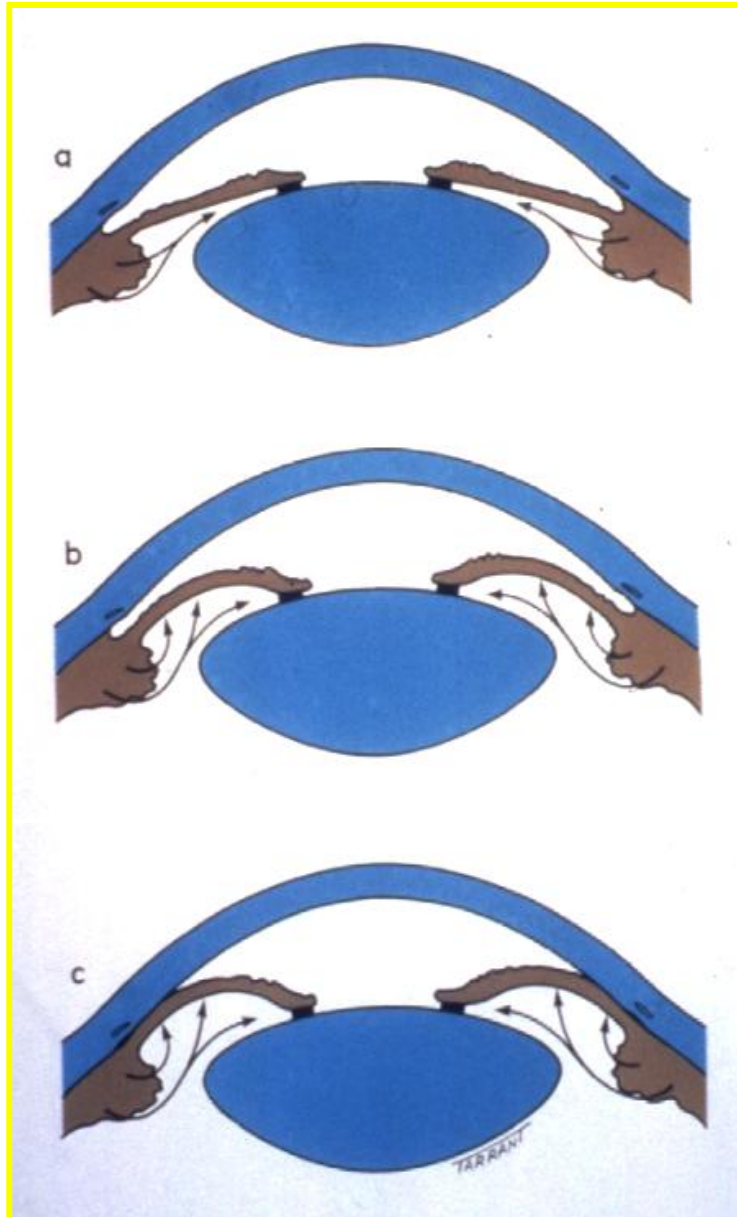


- **Shallow anterior chamber**



- **Narrow entrance to chamber angle**

# Pupil block



- **Increase in physiological pupil block**

- **Dilatation of pupil renders peripheral iris more flaccid**
- **Increased pressure in posterior chamber causes iris bombe**

- **Angle obstructed by peripheral iris and rise in IOP**

# Classification

## 1. **Latent** - asymptomatic

- IOP may remain normal
- May progress to subacute, acute or chronic angle closure

## 2. **Subacute** - intermittent angle closure

- May develop acute or chronic angle closure

## 3. **Acute**

- **Congestive** - sudden total angle closure
- **Postcongestive** - follows acute attack

## 4. **Chronic** - 'creeping or latent' angle closure

- Follows intermittent angle closure

## 5. **Absolute**

- No PL following acute attack



# Intermittent angle-closure glaucoma

## Signs



- **Epithelial oedema and closed angle during attack**

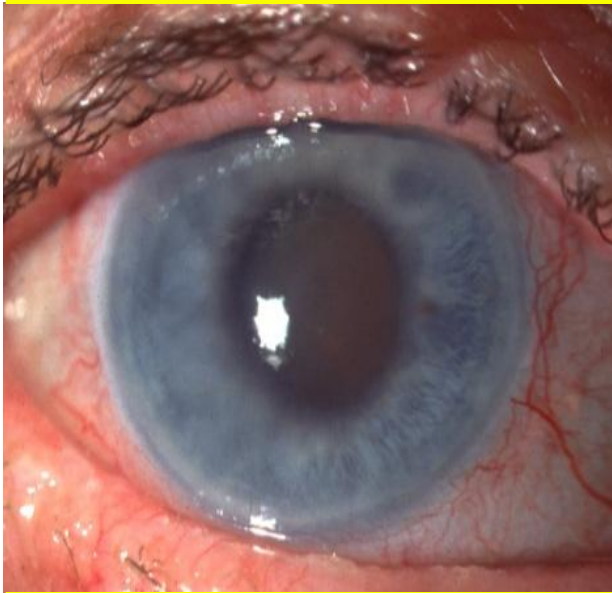
## Treatment



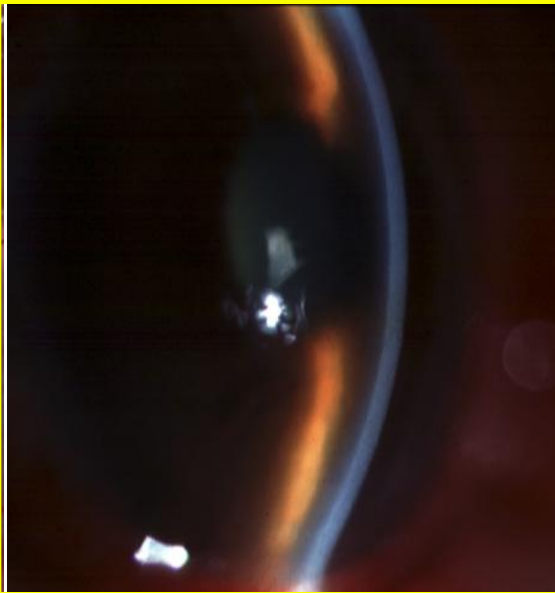
- **Treatment - bilateral YAG laser iridotomy**

# Acute congestive angle-closure glaucoma

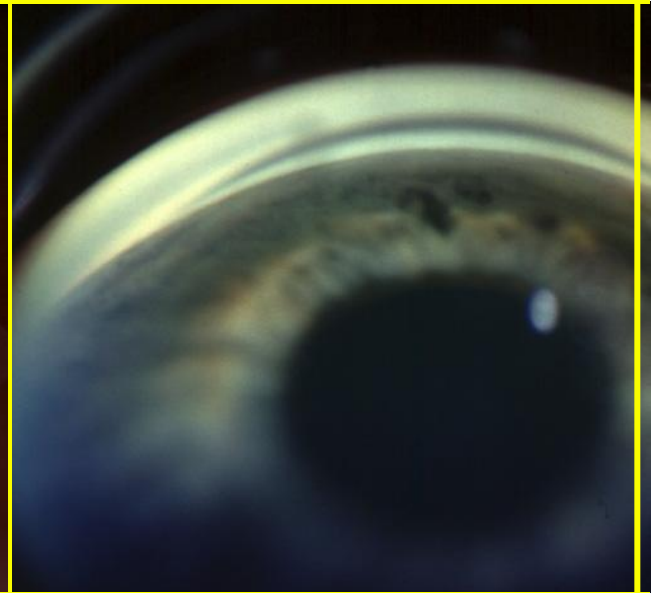
## Signs



- **Severe corneal oedema**
- **Dilated, unreactive, vertically oval pupil**



- **Ciliary injection**
- **Shallow anterior chamber**



- **Complete angle closure (Shaffer grade 0)**

# **Treatment of Acute Congestive Angle-Closure Glaucoma**

**1. Acetazolamide 500 mg i.v.**

**2. Hyperosmotic agents - if appropriate**

- **Oral glycerol 1-1.5 g/kg of 50% solution in lemon juice**
- **Intravenous mannitol 2g/kg of 20% solution**

**3. Topical therapy**

- **Pilocarpine 2% to both eyes**
- **Beta-blockers**
- **Steroids**

**4. YAG laser iridotomy**

- **To both eyes when cornea is clear**

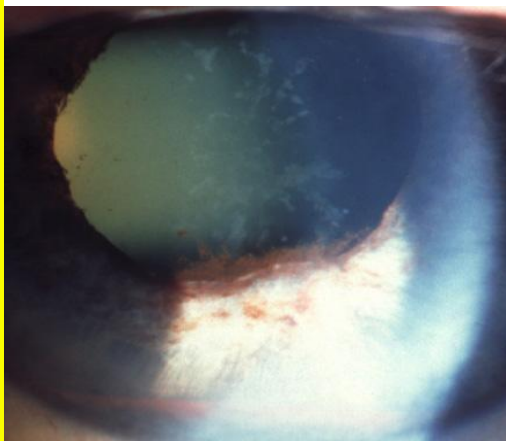
# Signs of postcongestive angle-closure glaucoma



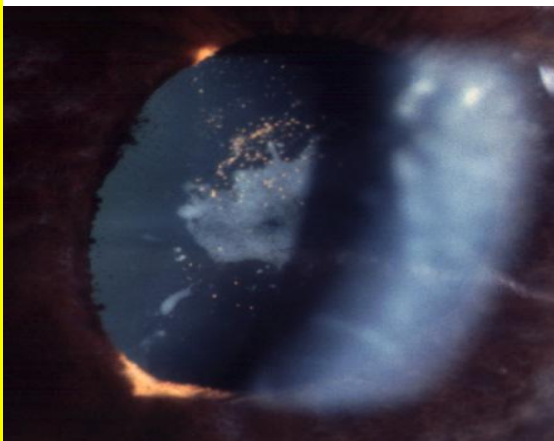
• **Folds in Descemet membrane**



• **Stromal iris atrophy with spiral-like configuration**



• **Posterior synechiae**  
• **Fine pigment on iris**



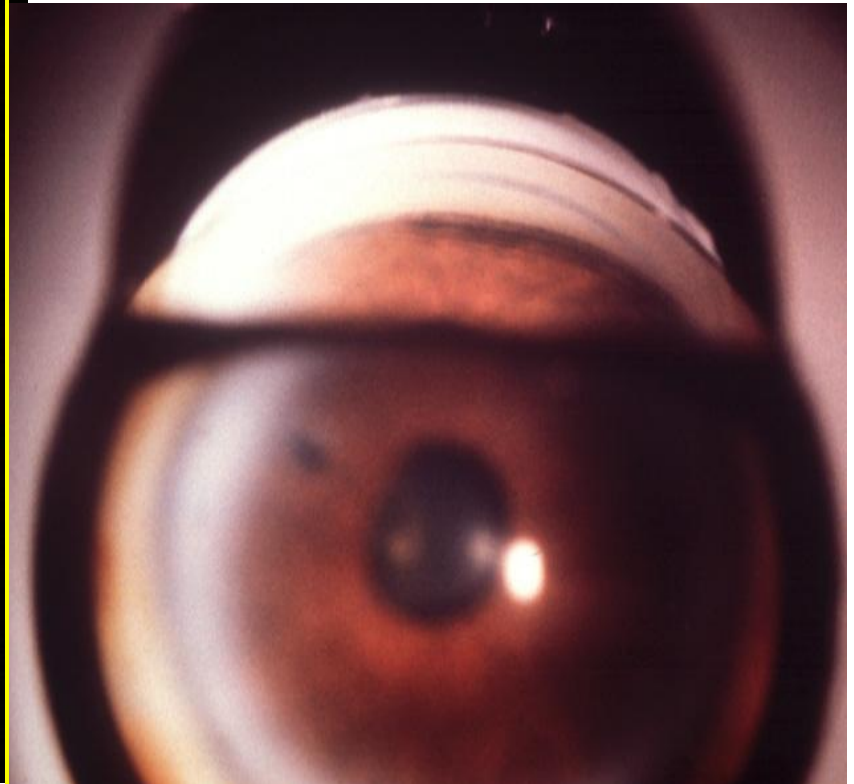
• **Fixed dilated pupil**  
• **Glaukomflecken**

# Chronic angle-closure glaucoma

## Signs



- **Similar to POAG with cupping and field loss**



- **Easily missed unless routine gonioscopy performed**
- **Variable amount of angle closure**

# **EPISSLERITIS AND SCLERITIS**

## **1. Episcleritis**

- **Simple**
- **Nodular**

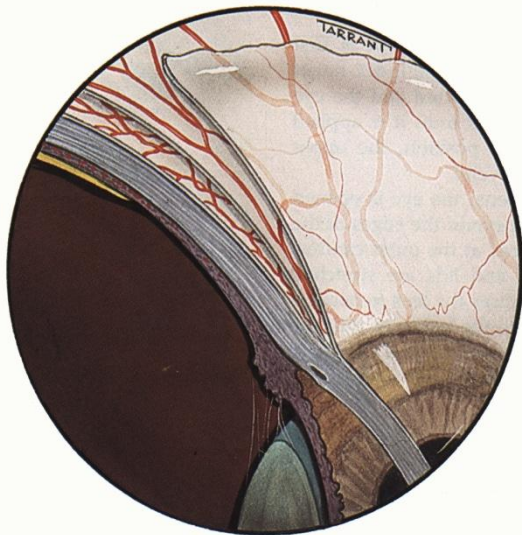
## **2. Anterior scleritis**

- **Non-necrotizing diffuse**
- **Non-necrotizing nodular**
- **Necrotizing with inflammation**
- **Necrotizing without inflammation**  
( **scleromalacia perforans** )

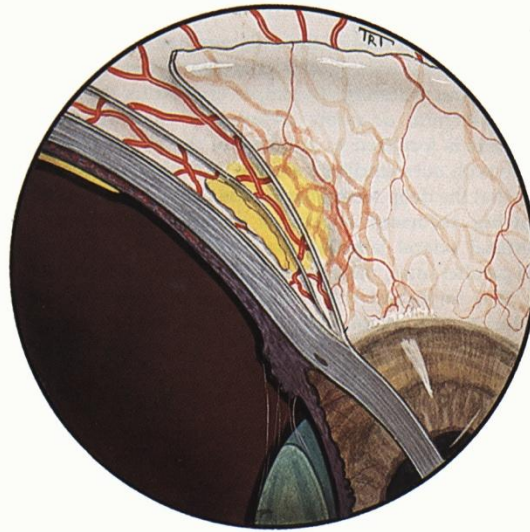
## **3. Posterior scleritis**

# Applied anatomy of vascular coats

**Normal**



**Episcleritis**



**Scleritis**



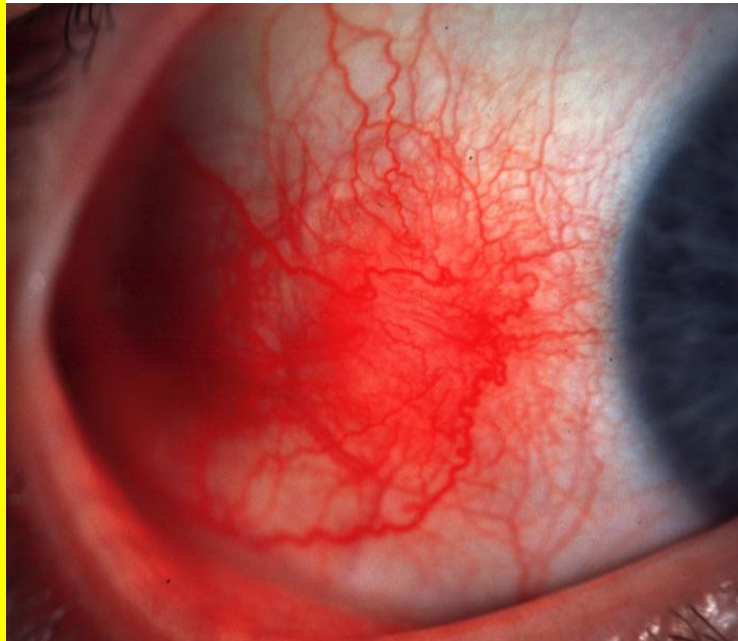
- **Radial superficial episcleral vessels**
- **Deep vascular plexus adjacent to sclera**

- **Maximal congestion of episcleral vessels**

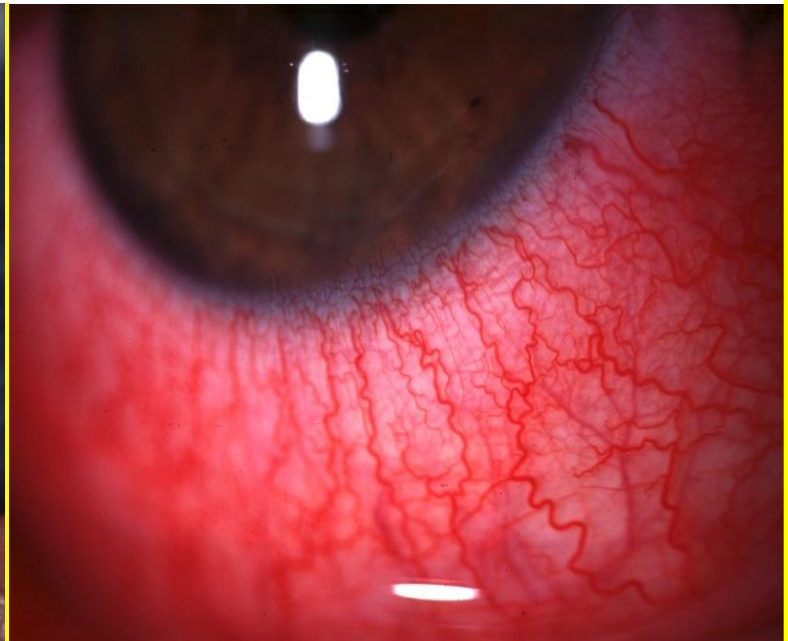
- **Maximal congestion of deep vascular plexus**
- **Slight congestion of episcleral vessels**

# Simple episcleritis

- **Common, benign, self-limiting but frequently recurrent**
- **Typically affects young adults**
- **Seldom associated with a systemic disorder**



**Simple sectorial  
episcleritis**



**Simple diffuse  
episcleritis**

## **Treatment**

- **Topical steroids**
- **Systemic flurbiprofen 400 mg tid if unresponsive**

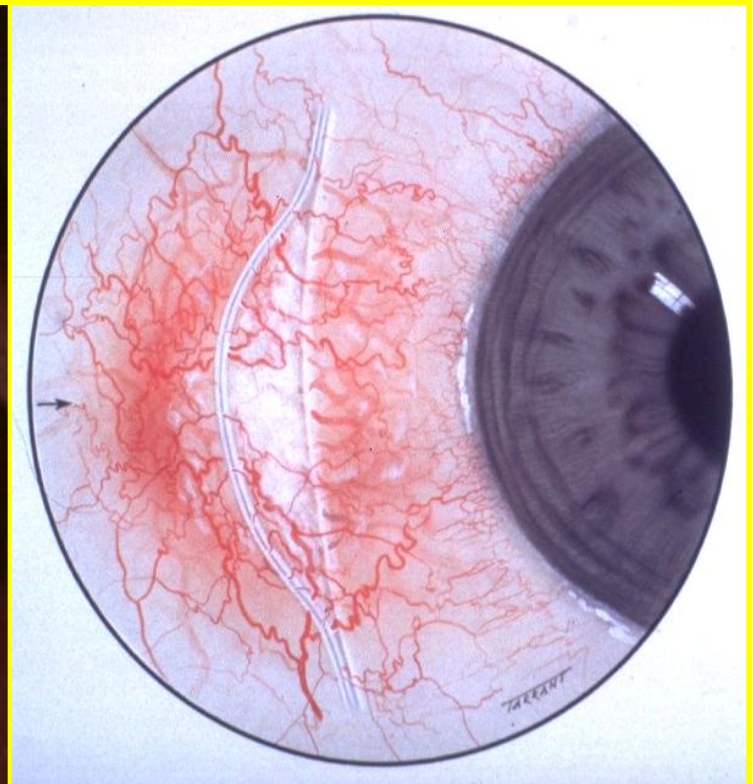


# Nodular episcleritis

- **Less common than simple episcleritis**
- **May take longer to resolve**
- **Treatment - similar to simple episcleritis**



**Localized nodule which can be moved over sclera**



**Deep scleral part of slit-beam not displaced**

# **Causes and Systemic Associations of Scleritis**

## **1. Rheumatoid arthritis**

## **2. Connective tissue disorders**

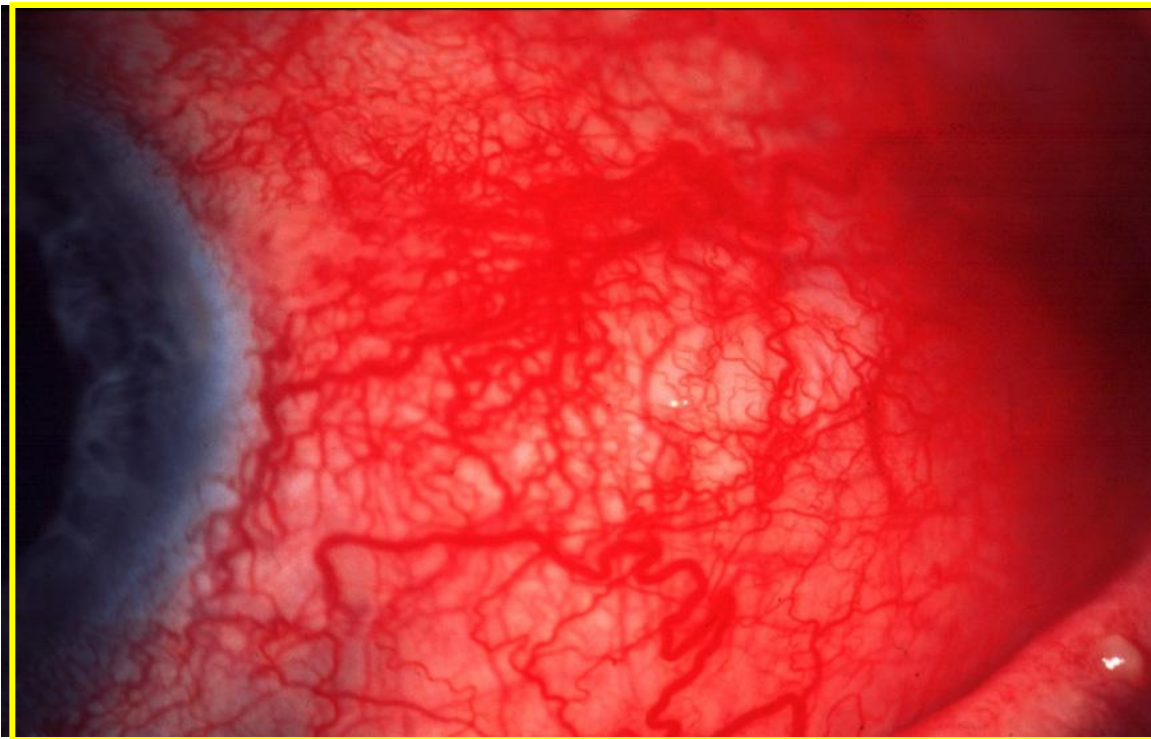
- **Wegener granulomatosis**
- **Polyteritis nodosa**
- **Systemic lupus erythematosus**

## **3. Miscellaneous**

- **Relapsing polychondritis**
- **Herpes zoster ophthalmicus**
- **Surgically induced**

# **Diffuse anterior non-necrotizing scleritis**

- **Widespread scleral and episcleral injection**
- **Relatively benign - does not progress to necrosis**



## **Treatment**

- **Oral NSAIDs**
- **Oral steroids if unresponsive**

# **ECTROPION AND ENTROPION**

## **1. Ectropion**

- **Involucional**
- **Cicatricial**
- **Paralytic**
- **Mechanical**

## **2. Entropion**

- **Involucional**
- **Cicatricial**
- **Congenital**
- **Epiblepharon**

# Involucional

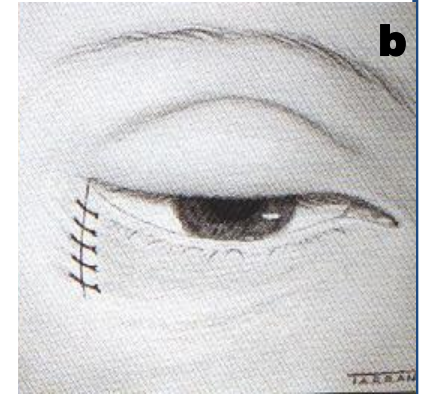
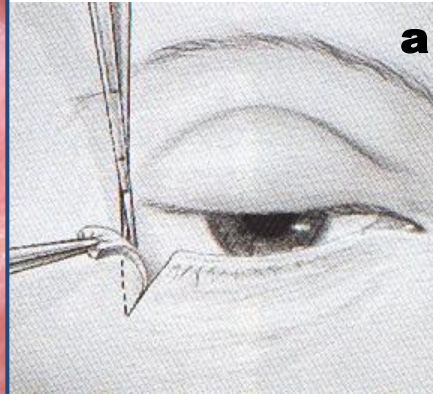


- **Affects lower lid of elderly patients**
- **May cause chronic conjunctival inflammation and thickening**

# Treatment of extensive ectropion



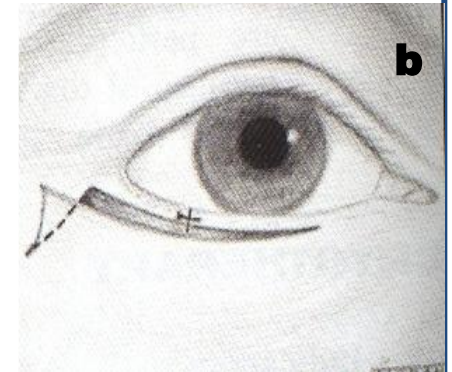
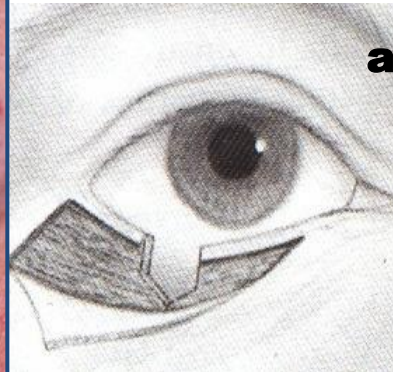
**Without marked excess skin**



**Horizontal lid shortening**

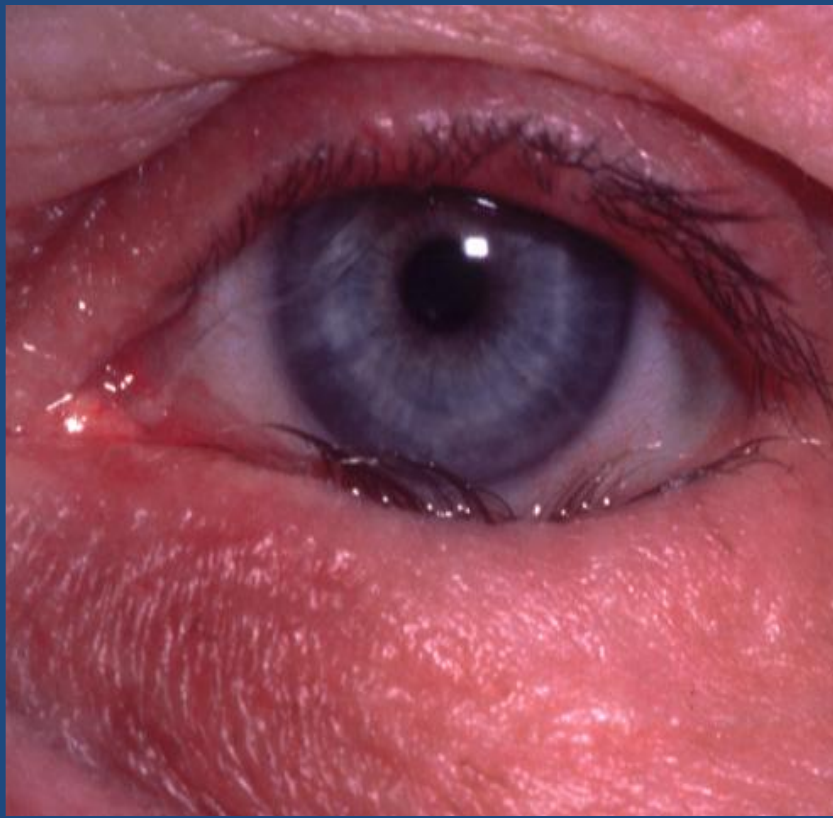


**With marked excess skin**



**Kuhnt-Szymanowski procedure**

# Involuntional entropion

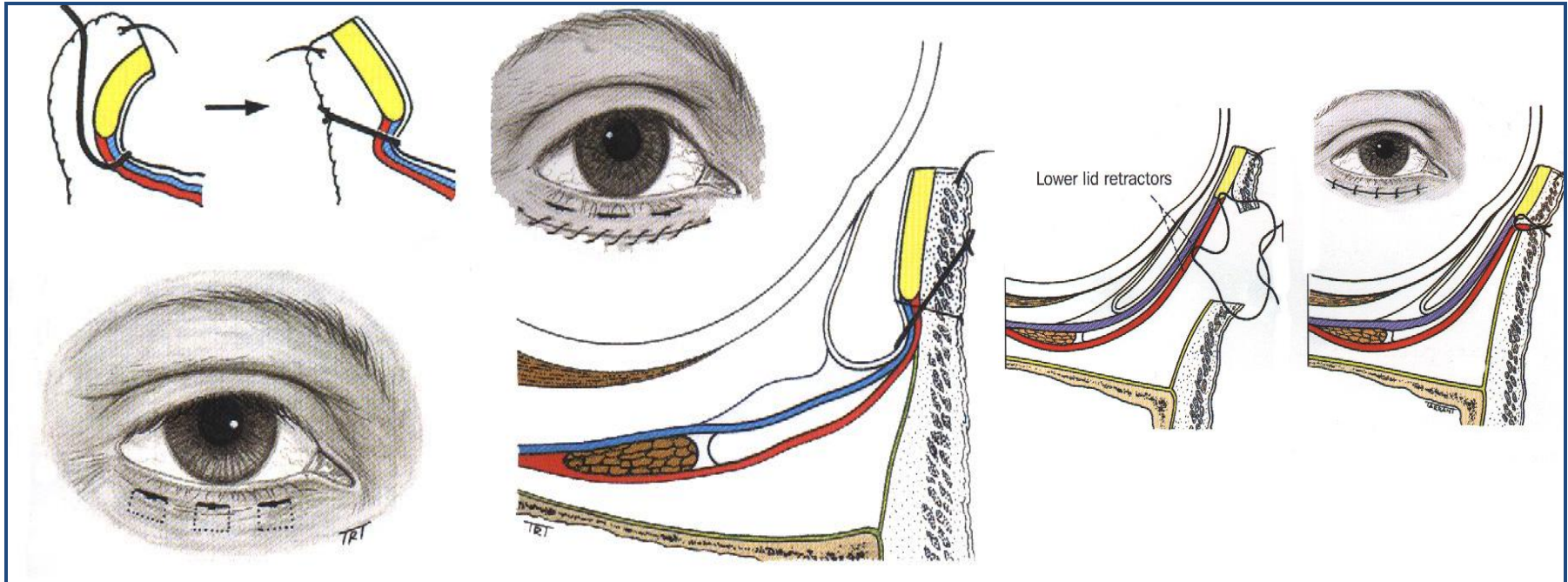


**Affects lower lid because upper lid has wider tarsus and is more stable**



**If longstanding may result in corneal ulceration**

# Treatment options for involutional entropion



• **Transverse  
everting  
sutures  
(temporary)**

• **Weis procedure  
(permanent)**

• **Jones procedure  
(for  
recurrences)**



**End**

**Thank you**

# Memorandum is Ophthalmology an Illustrated colour text

- Basic principles
  - anat, histo, phys and pharms
- Diseases
  - Acute visual loss causes
  - Red eye causes
  - Chronic visual loss causes