

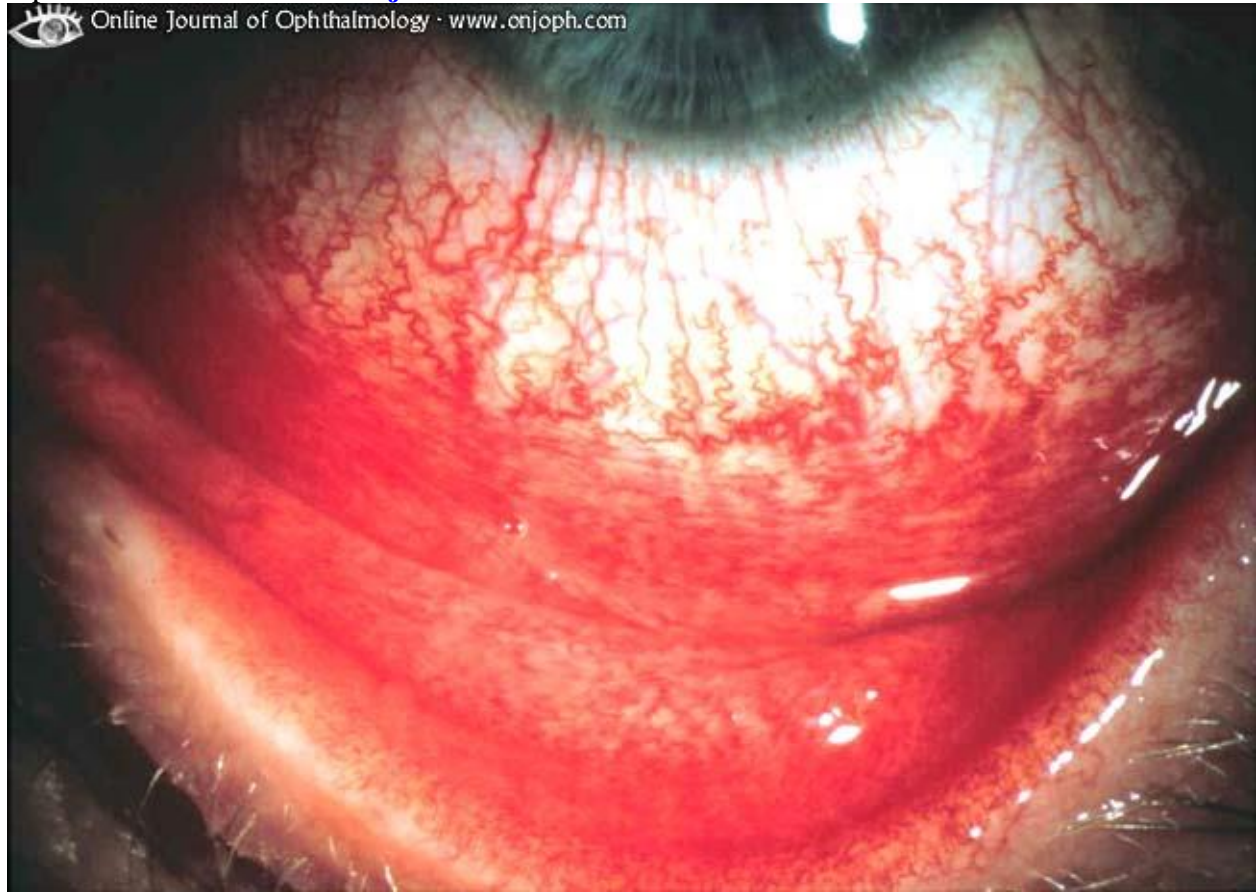
Conjunctival and Scleral Disorders

Last updated: September 5, 2017

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 OCULAR CICATRICIAL PEMPHIGOID → see p. 2991 >>

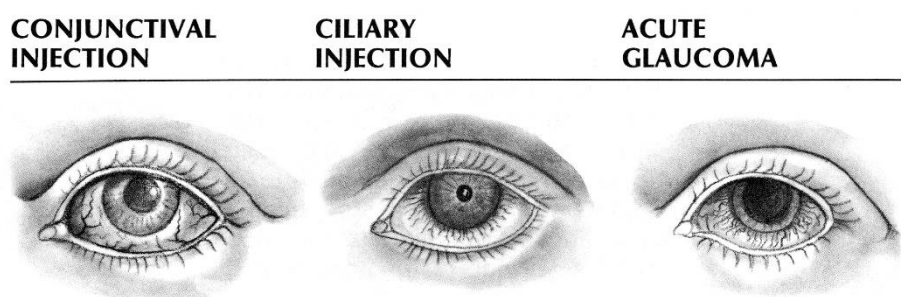
EYE HYPEREMIA

Diffuse conjunctival hyperemia (mainly posterior conjunctival blood vessels) – *movable* bright red irregular vessels, *fading toward cornea*, both bulbar and tarsal conjunctivae; vessels constrict with topical vasoconstrictors – **conjunctivitis**:



Source of picture: "Online Journal of Ophthalmology" >>

Circumcorneal (perilimbal) deep hyperemia (branches of anterior ciliary artery) – *nonmovable*, dilated, fine, straight, deep vessels that regularly *radiate 1-3 mm out from limbus* – **iritis, acute glaucoma, keratitis**.



Large patch of deep hyperemia (involving 20-100% of bulbar surface without hyperemia of tarsal surface) – **episcleritis, scleritis**.

SUBCONJUNCTIVAL HEMORRHAGES

- gross blood extravasation beneath conjunctiva.

- appears as nonmovable homogenous red patch (vessels are not visible).
- may occur after minor trauma / straining / sneezing / coughing; rarely, spontaneously.
- **no pathologic significance!!!** (if recurs – consider bleeding diathesis)
- absorbed spontaneously (usually within 2 wk).
- *reassurance is adequate therapy* (topical corticosteroids, antibiotics, vasoconstrictors, compresses do not speed reabsorption).

CONJUNCTIVAL EDEMA

Bulbar conjunctiva - translucent, bluish, thickened conjunctiva.

CHEMOSIS - gross edema with conjunctiva ballooning & prolapse.

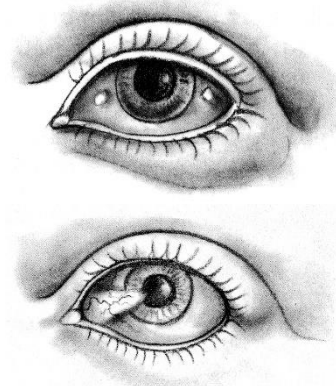
Tarsal conjunctiva - fine, minute projections (papillae), giving conjunctiva velvety appearance.

HYPERPLASIA OF LYMPHOID FOLLICLES (most commonly in inferior tarsal conjunctiva) - small bumps with pale centers.

BENIGN NEOPLASMS OF CONJUNCTIVA

PINGUECULA - raised yellowish white mass (connective tissue accumulation) on bulbar conjunctiva, adjacent to cornea (at 3- and/or 9-o'clock position); unsightly but *does not grow onto cornea* (need not be removed); may become inflamed (responds to topical steroids).

PTERYGIUM - fleshy triangular bulbar conjunctiva *growth onto cornea* (at 3- and/or 9-o'clock position) - may spread across and distort cornea → astigmatism, change in refractive power (H: removal).



ACUTE CONJUNCTIVITIS

ETIOLOGY

1. Viruses
2. Bacteria
3. Allergy – *seasonal allergic conjunctivitis* see p. 1665 (1-2) >>
4. Irritation (wind, dust, smoke, air pollution, intense UV, reflection from snow, eyelid pathology), foreign bodies.

CLINICAL FEATURES

	ACUTE CONJUNCTIVITIS		
	VIRAL	BACTERIAL	ALLERGIC
Discharge (cells)	clear, watery (mononuclear cells)	purulent (polymorphonuclear cells)	clear, mucoid, ropy (eosinophils)
Lid swelling	+	++	+++
Preauricular node swelling	+	+/-	-
Itching	-	-	+++

- **ocular irritation** (photophobia, foreign-body sensation), **diffuse hyperemia & edema** (bulbar + tarsal).
- **discharge**; eyelids are stuck together on awakening.
- cornea*, iris, pupils, vision intact.
*focal corneal inflammation is possible → residual corneal scarring (0.5-1.0 mm) may be visible by slit lamp for up to 2 yr. (may result in decreased vision and significant glare).

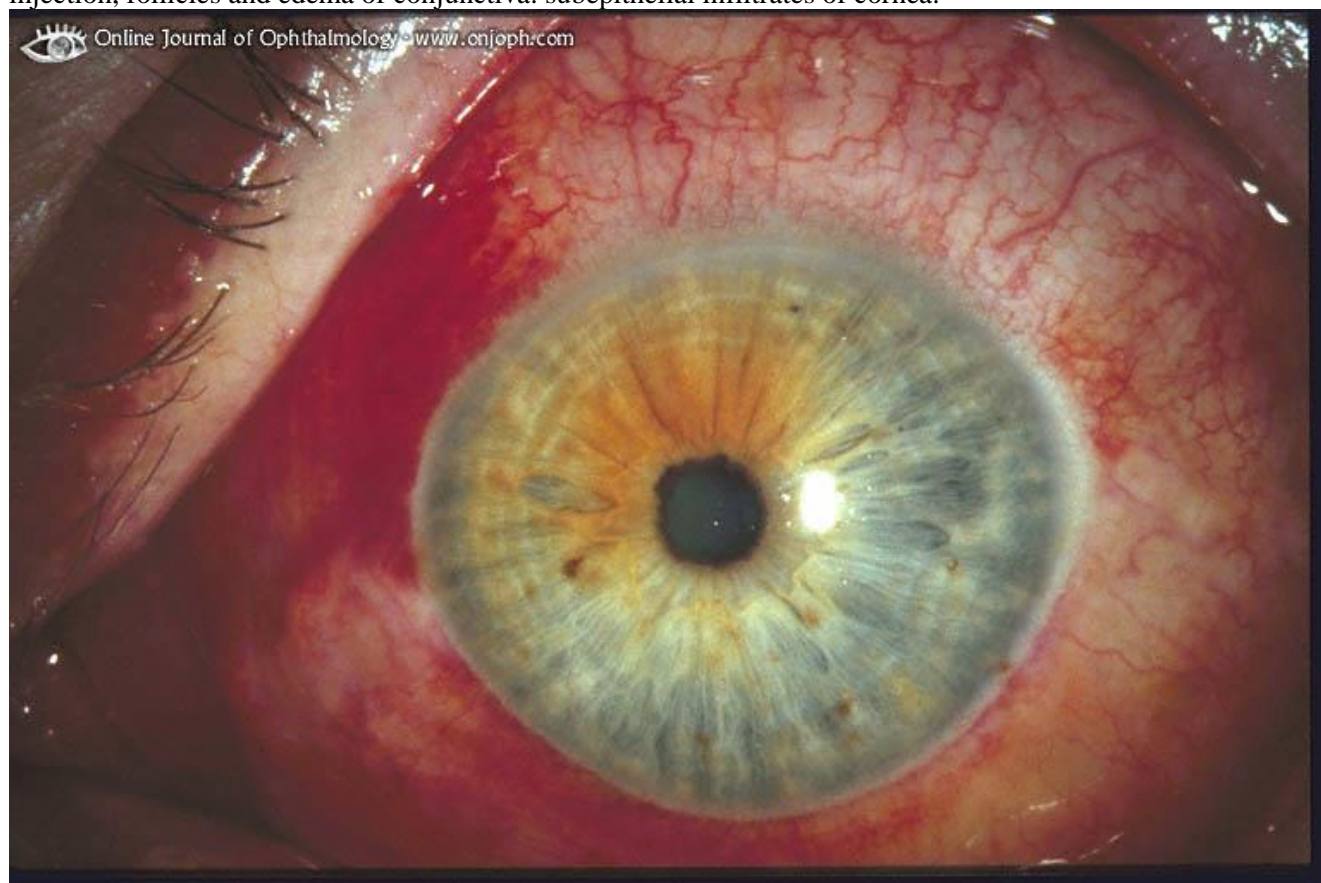
N.B. always perform **corneal fluorescein staining!**

VIRAL CONJUNCTIVITIS

Adenoviruses

- 1) **pharyngoconjunctival fever** (serotypes Ad 3, 4, 7)
- 2) **epidemic keratoconjunctivitis** (serotypes Ad 8, 19, 37, 5):

injection, follicles and edema of conjunctiva. subepithelial infiltrates of cornea:



Source of picture: "Online Journal of Ophthalmology" >>

pseudo-membrane of fibrin & pus (can easily be peeled off without epithelial defect or bleeding):



Source of picture: "Online Journal of Ophthalmology" >>

Enterovirus type 70 - outbreaks of **acute hemorrhagic conjunctivitis**.

Herpesviruses

Coxsackieviruses

May be unilateral!

DIAGNOSIS

- although **cultures** can be taken, *special tissue culture facilities* are necessary; secondary bacterial infection is very rare (if suspected → stained eye smears, cultures).

TREATMENT

- **no treatment** is needed or available!
- **self-limiting**, lasting 1-3 wk in severe cases.
- **highly contagious!!!** - wash hands thoroughly, avoid touching noninfected eye after touching infected eye or nasal secretions, avoid sharing towels or pillows.
- eyes should be kept free of discharge and should not be patched.
- severe conjunctivitis associated with pseudomembranes, vision-limiting corneal inflammation / scarring → topical **corticosteroids** (N.B. can exacerbate ocular herpes simplex virus infections!!!).

BACTERIAL CONJUNCTIVITIS

- Neisseria gonorrhoeae* - **gonococcal conjunctivitis** see p. 229 (9) >>
- Chlamydia trachomatis* (type D-K) - **inclusion conjunctivitis** see p. 244 (4) >>
- Staphylococcus aureus*
- Streptococcus pneumoniae*
- Haemophilus influenzae*.

DIAGNOSIS

- **discharge** should be cultured, **smears** should be stained with Gram stain (to identify bacteria) and with Giemsa stain (to determine leukocytic response).

TREATMENT

- bacteria are **contagious - spread by hand-to-eye and fomite inoculation**.
 - lasts up to 3 wk without treatment and 1-2 days with topical treatment (qid for 7-10 days):
 - a) **SULFACETAMIDE SODIUM** 10%
 - b) **TRIMETHOPRIM / POLYMYXIN B**
 - c) **GATIFLOXACIN** (ZYMAXID®) 0.5% - FDA approved
 - d) **BESIFLOXACIN** (BESIVANCE®) 0.6% ophthalmic suspension - FDA approved
- N.B. poor clinical response after 2-3 days - insensitive bacterium, virus, or allergy.

OPHTHALMIA NEONATORUM (s. BLENNORRHEA NEONATORUM, NEONATAL CONJUNCTIVITIS, INFANTILE PURULENT CONJUNCTIVITIS)

- bacterial conjunctivitis within first 10 days of life.

ETIOLOGY

- in decreasing order:

1. **Chemical injury** - secondary to instillation of **silver nitrate** drops (for ocular prophylaxis); appears within 6-8 h after instillation, disappears spontaneously within 1-3 d.
 2. **Bacterial infection** (acquired during parturition):
 - a) **Chlamydia trachomatis type D-K** (2-4% live births – no prophylaxis is currently used); account for 30-50% of conjunctivitis in infants < 4 wk; occurs 5-14 days after birth
 - b) **Haemophilus influenzae**
 - c) **Neisseria gonorrhoeae** (gonorrhoeal ophthalmia); appears 2-5 days after birth (or earlier with premature rupture of membranes) [see p. 229 \(9\) >>](#)
Isolation of other bacteria (e.g. *S. aureus*, *Str. pneumoniae*) usually represents colonization rather than infection.
 3. **Viral infection** - **herpes simplex virus** types 1 and 2 - **herpetic keratoconjunctivitis**. [see p. 256 \(5\) >>](#)
- etiology is difficult to distinguish on clinical grounds alone.

DIAGNOSIS

Chlamydial ophthalmia - conjunctival tissue culture, direct monoclonal antibody tests and ELISA; on smear - mononuclear reaction with no m/o.

Gonorrhoeal ophthalmia - culture and Gram stain of conjunctival specimen.

Herpetic keratoconjunctivitis - immunofluorescence in conjunctival cultures (N.B. diagnosis is crucial - disease may disseminate to CNS and other organs!!!).

TREATMENT

Chlamydial ophthalmia – systemic **ERYTHROMYCIN** ethylsuccinate (50 mg/kg/day po q6-8h 2 wk).

Gonorrhoeal ophthalmia – systemic **CEFTRIAXONE** (25-50 mg/kg IM) + frequent saline irrigations (topical a/b are not needed).

Other bacteria - topical **POLYMYXIN + BACITRACIN, ERYTHROMYCIN, TETRACYCLINE**.

Herpetic keratoconjunctivitis - systemic **ACYCLOVIR** (30 mg/kg/day q8h 2-3 wk) + topical **TRIFLURIDINE OR VIDARABINE** while awake + **IDOXURIDINE** ointment at bedtime.

N.B. **ointments containing corticosteroids** may seriously exacerbate eye infections due to *Chlamydia trachomatis* or *herpes simplex virus*!

CHRONIC CONJUNCTIVITIS

- exacerbations and remissions that occur over months or years.

- causes - similar to acute conjunctivitis;
 - Chlamydia trachomatis** (types A-C) - **trachoma** [see p. 244 \(3\) >>](#)
 - allergy: giant papillary conjunctivitis** [see p. Eye72 >>](#)
vernal keratoconjunctivitis, perennial allergic conjunctivitis [see p. 1665 \(1-2\) >>](#)
- symptoms ≈ acute conjunctivitis but less severe (may be without discharge).

Trachoma; follicle formation of conjunctiva that looks like sago grains:



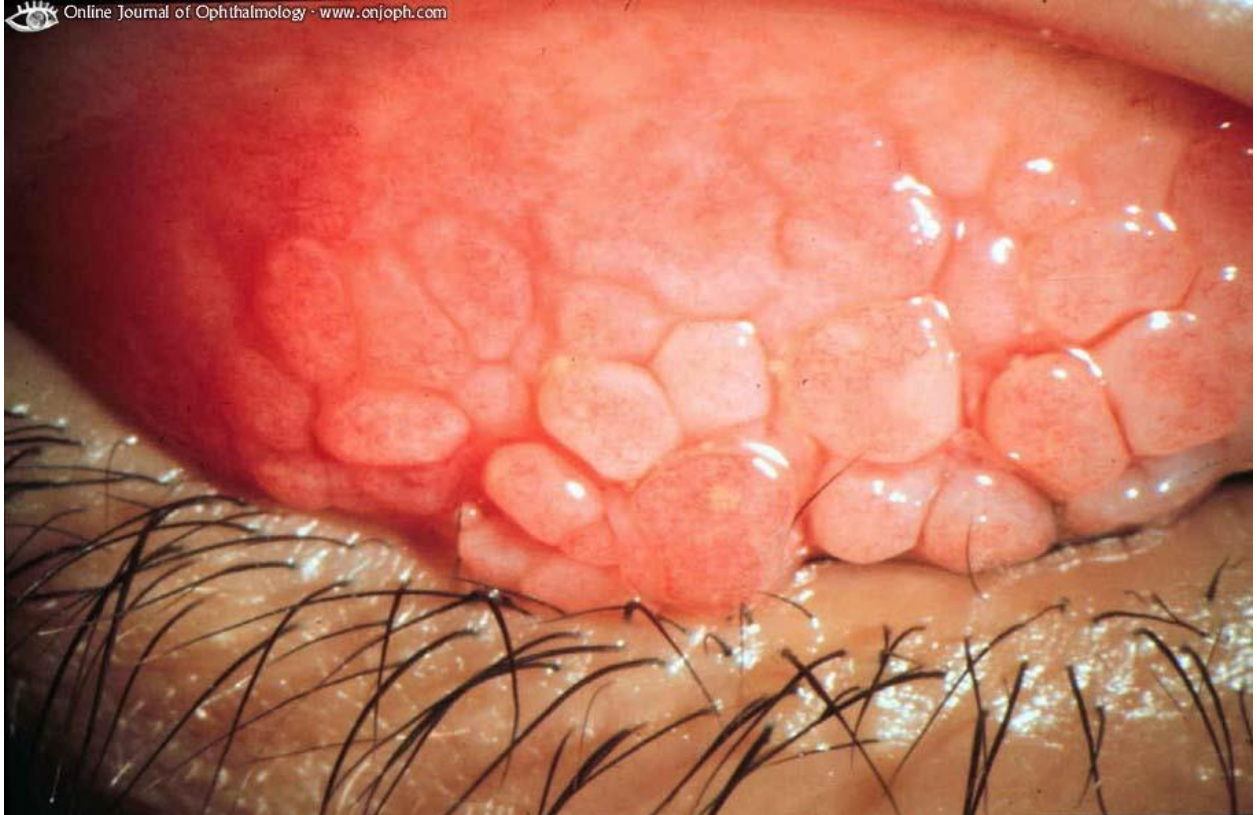
Source of picture: "Online Journal of Ophthalmology" >>

Trachoma; conjunctival cicatrization with shrinkage (esp. conjunctival side of upper lid), entropion and trichiasis; thickened epithelium near limbus; cornea opacified due to xerosis, formation of pannus and trichiasis:



Source of picture: "Online Journal of Ophthalmology" >>

Vernal Conjunctivitis



Source of picture: "Online Journal of Ophthalmology" >>

Follicular conjunctivitis - upper lid has been everted showing giant papillae:



- therapy depends on cause.
 - irritating factors must be eliminated.
 - overtreatment may produce drug sensitivity!

EPISCLERITIS

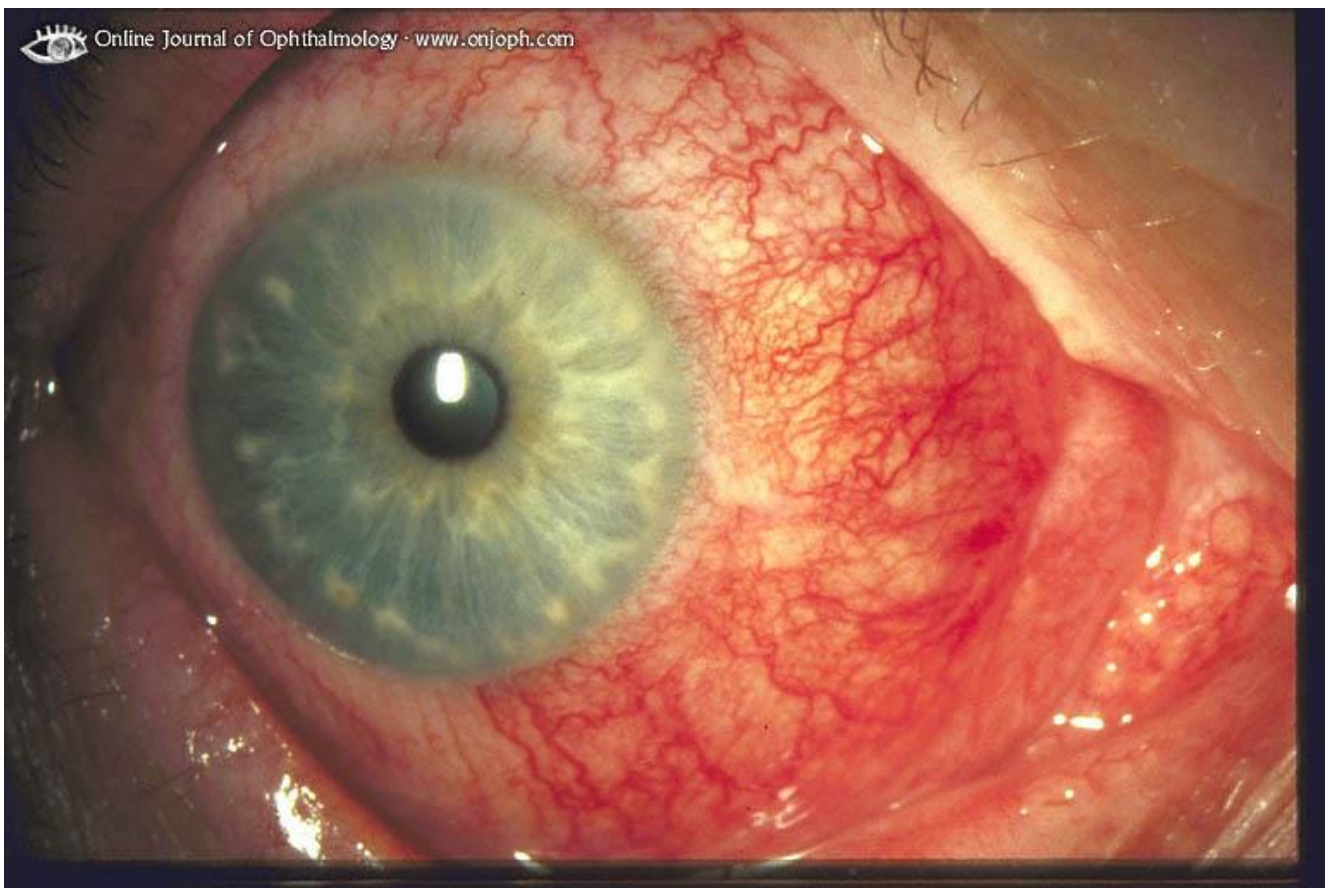
- occurs in young adults; tends to recur.
- cause can be **any inflammatory systemic condition** (e.g. RA, Sjögren syndrome, coccidioidomycosis, syphilis, zoster, tuberculosis); most often etiology cannot be determined.
- tenderness, irritation, mild photophobia, some lacrimation.

LOCALIZED CONJUNCTIVAL HYPEREMIA - bright red patch just under bulbar conjunctiva (*simple episcleritis*) or hyperemic, edematous, raised nodule (*nodular episcleritis*).

N.B. palpebral conjunctiva is normal!

- **self-limited** - treatment options:
 - a) **no treatment**
 - b) topical **vasoconstrictors** (e.g. tetrahydrozoline HCl) + topical **corticosteroid** OR oral **NSAID**.

Diffuse episcleritis in Epidemic Keratoconjunctivitis (hyperemic conjunctival and episcleral vessels):



Source of picture: "Online Journal of Ophthalmology" >>

SCLERITIS

- **severe, destructive, vision-threatening*** inflammation of deep episclera and sclera.

*14% lose significant visual acuity within 1 yr!

CLINICAL FEATURES

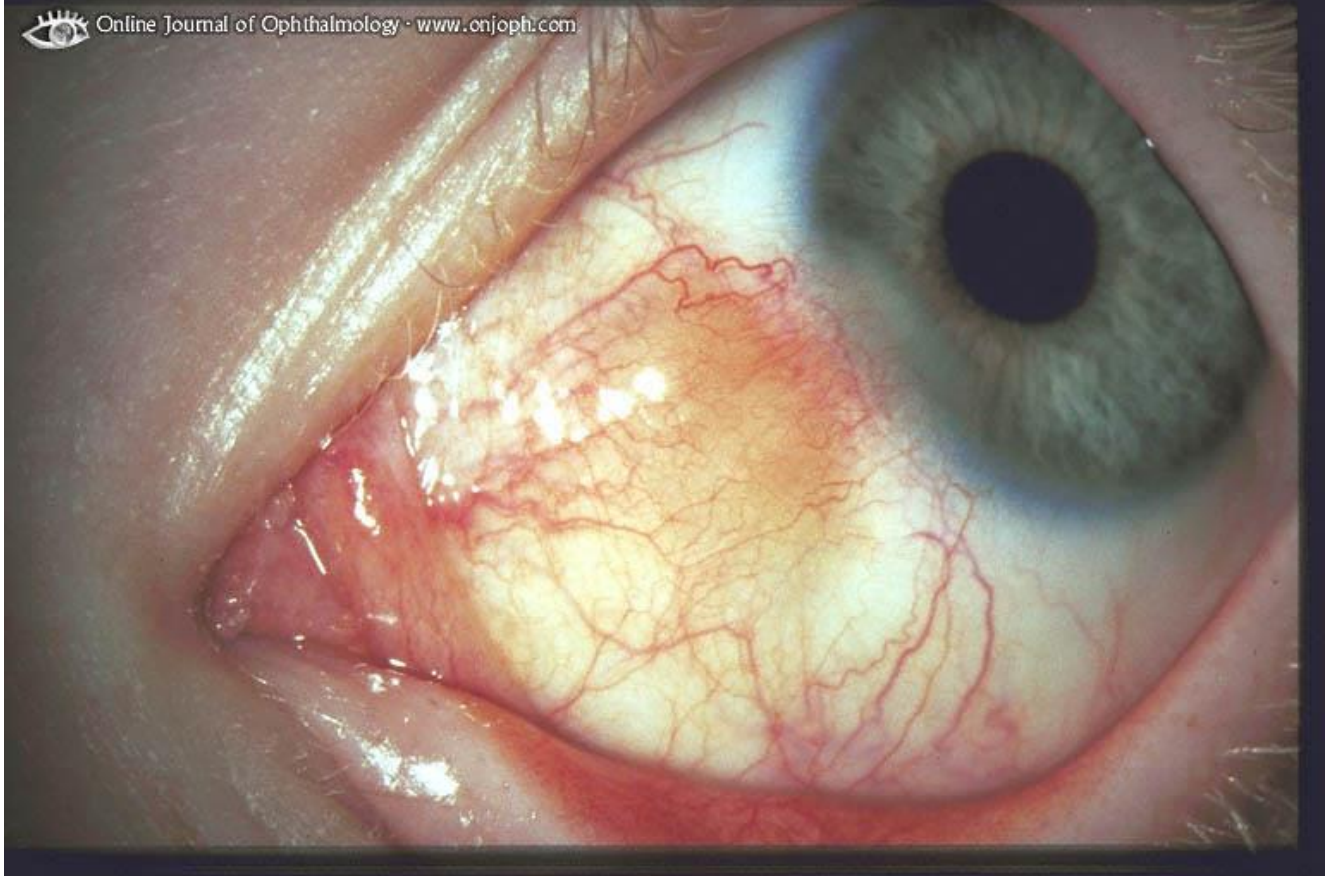
- most common in 4-6th decades.
- **extreme deep PAIN** - interferes with sleep and appetite!
- tenderness, photophobia, lacrimation.
- **BULBAR HYPEREMIA:**
 - deep beneath conjunctiva, more bluish than in episcleritis!
 - surrounding and overlying bulbar conjunctiva is hyperemic (palpebral conjunctiva is normal!)
 - sectoral or widespread (**diffuse scleritis**);
 - may contain hyperemic, edematous, raised nodule (**nodular scleritis**);
 - may contain avascular area (**necrotizing scleritis**) → globe perforation and eye loss may ensue.
- associated **connective tissue disease** (RA, gout) in 20% (in 50% with necrotizing scleritis).
 N.B. **necrotizing scleritis in association with RA** → 50% mortality in 10 yr (mostly from MI)!

necrotizing scleritis with severe RA; superficial and deep injection:



Source of picture: "Online Journal of Ophthalmology" >>

nodular scleritis - elevated, hyperemic, painful:



Source of picture: "Online Journal of Ophthalmology" >>

scleritis and scleromalacia in RA:



necrotizing scleritis - areas of pallor within diffuse areas of redness indicating ischaemia:



posterior scleritis - posterior fundus shows choroidal folds caused by thickened sclera which pushes choroids inward:



Source of picture: "Online Journal of Ophthalmology" >>

TREATMENT

- systemic **corticosteroid**.

- if unresponsive or necrotizing scleritis + RA → systemic **immunosuppression** (e.g. cyclophosphamide, azathioprine).

BIBLIOGRAPHY for ch. "Ophthalmology" → follow this [LINK](#) >>