Conjunctival and Scleral Disorders

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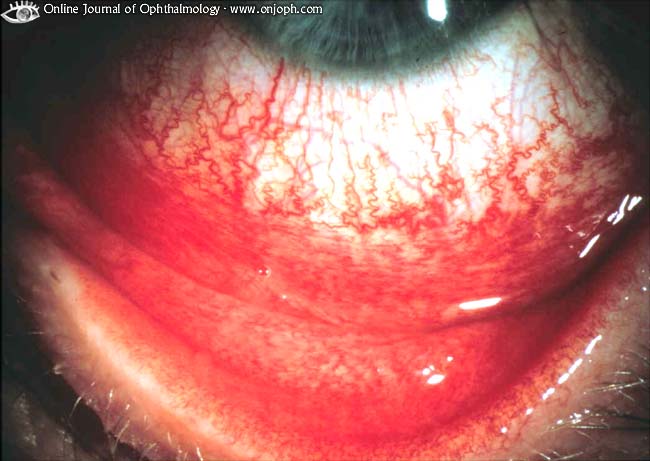
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**Ocular Cicatricial Pemphigoid** → see [p. 2991 >>](http://www.neurosurgeryresident.net/USMLE%202\Skin%20(2931-3030)\2991.%20Bullous%20Diseases.pdf)

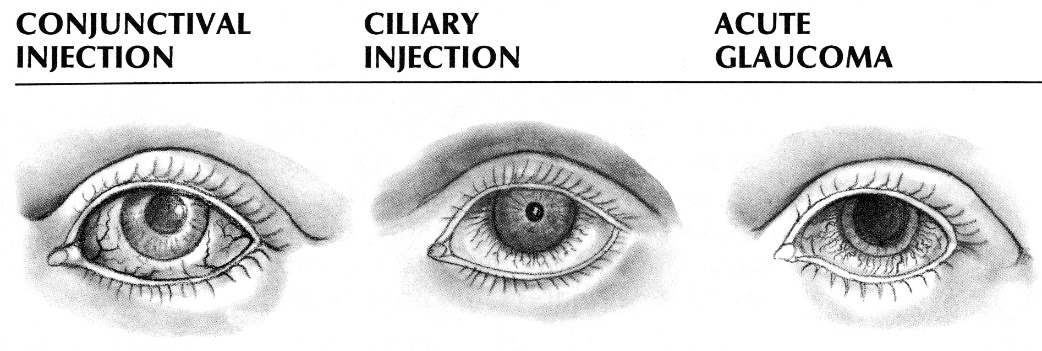
**Eye Hyperemia**

**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**:

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[Source of picture: “Online Journal of Ophthalmology” >>](http://www.atlasophthalmology.com/atlas/frontpage.jsf?locale=en)

**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). | D:\Viktoro\Neuroscience\Eye. Ophthalmology\00. Pictures\Pinguecula.jpg |
| **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). | D:\Viktoro\Neuroscience\Eye. Ophthalmology\00. Pictures\Pterygium.jpg |

Acute Conjunctivitis

Etiology

1. **Viruses**
2. **Bacteria**
3. **Allergy** – ***seasonal allergic conjunctivitis*** [see p. 1665 (1-2) >>](HTTP://WWW.NEUROSURGERYRESIDENT.NET/USMLE%202/Immunology%20(1650-1700)/1665_(1).jpg)
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).

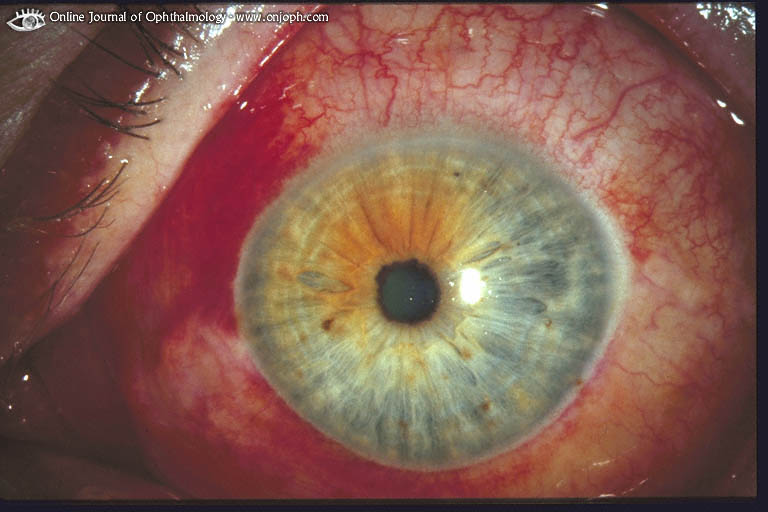
N.B. always perform **corneal fluorescein staining**!

VIRAL CONJUNCTIVITIS

**Adenoviruses**

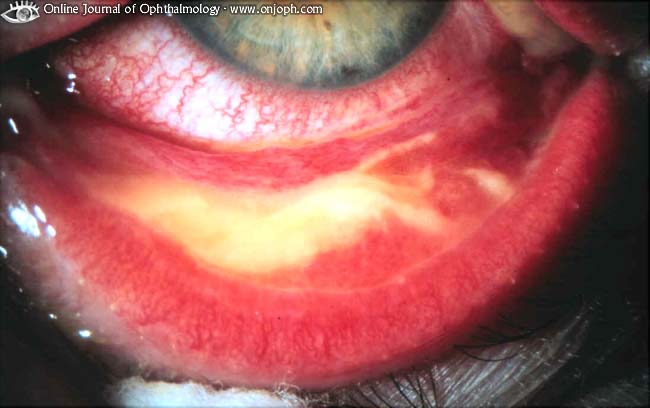
1. ***pharyngoconjunctival fever***(serotypes Ad 3, 4, 7)
2. ***epidemic keratoconjunctivitis*** (serotypes Ad 8, 19, 37, 5):

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



[Source of picture: “Online Journal of Ophthalmology” >>](http://www.atlasophthalmology.com/atlas/frontpage.jsf?locale=en)

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



[Source of picture: “Online Journal of Ophthalmology” >>](http://www.atlasophthalmology.com/atlas/frontpage.jsf?locale=en)

**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) >>](http://www.neurosurgeryresident.net/USMLE%202\Infection%20(201-300)\229%20(9).jpg)

*Chlamydia trachomatis* (type D-K) - ***inclusion conjunctivitis*** [see p. 244 (4) >>](http://www.neurosurgeryresident.net/USMLE%202\Infection%20(201-300)\244%20(4).jpg)

*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):
  + 1. sulfacetamide sodium 10%
    2. trimethoprim / polymyxin B
    3. gatifloxacin (Zymaxid®) 0.5% - FDA approved
    4. 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):
3. ***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
4. ***Haemophilus influenzae***
5. ***Neisseria gonorrhoeae*** (gonorrheal ophthalmia); appears 2-5 days after birth (or earlier with premature rupture of membranes) [see p. 229 (9) >>](http://www.neurosurgeryresident.net/USMLE%202\Infection%20(201-300)\229%20(9).jpg)

Isolation of other bacteria (e.g. *S. aureus, Str. pneumoniae*) usually represents colonization rather than infection.

1. **Viral infection** - ***herpes simplex virus*** types 1 and 2 - **herpet**ic keratoconjunctivitis.

[see p. 256 (5) >>](http://www.neurosurgeryresident.net/USMLE%202\Infection%20(201-300)\256%20(5a).%20HSV.pdf)

* 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.

**Gonorrheal 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).

**Gonorrheal 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) >>](http://www.neurosurgeryresident.net/USMLE%202\Infection%20(201-300)\244%20(3).jpg)

**allergy**: ***giant papillary conjunctivitis*** [see p. Eye72 >>](http://www.neurosurgeryresident.net/Eye.%20Ophthalmology\Eye72.%20Refractive%20Errors,%20Contact%20Lenses.pdf)

***vernal keratoconjunctivitis, perennial allergic conjunctivitis*** [see p. 1665 (1-2) >>](HTTP://WWW.NEUROSURGERYRESIDENT.NET/USMLE%202/Immunology%20(1650-1700)/1665_(1).jpg)

* symptoms ≈ acute conjunctivitis but less severe (may be without discharge).

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



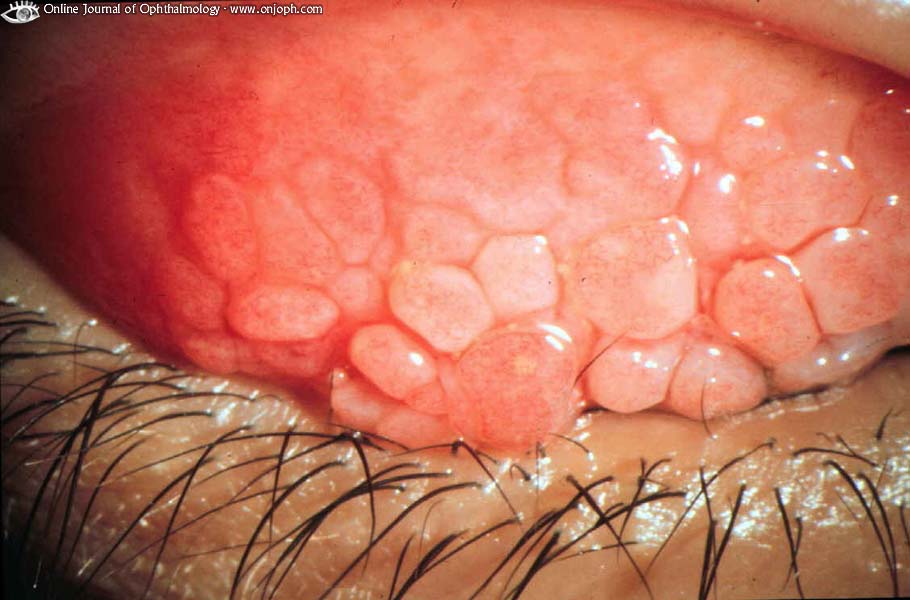
[Source of picture: “Online Journal of Ophthalmology” >>](http://www.atlasophthalmology.com/atlas/frontpage.jsf?locale=en)

***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” >>](http://www.atlasophthalmology.com/atlas/frontpage.jsf?locale=en)

***Vernal Conjunctivitis***



[Source of picture: “Online Journal of Ophthalmology” >>](http://www.atlasophthalmology.com/atlas/frontpage.jsf?locale=en)

***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

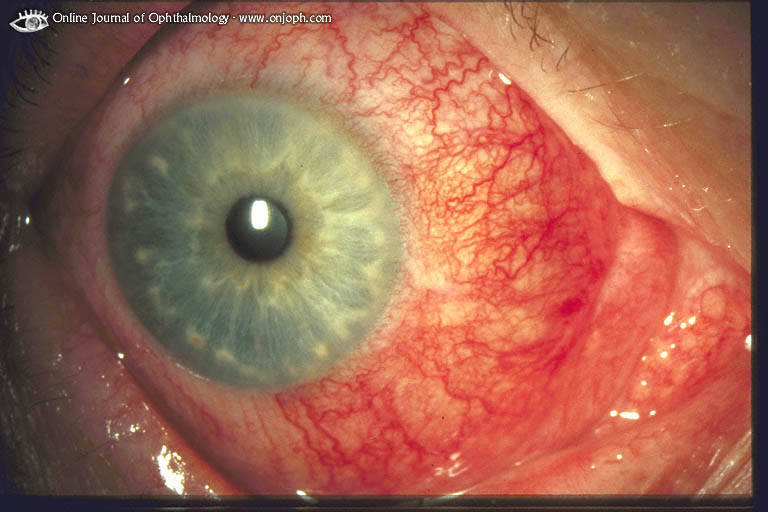
* occurs in young adults; tends to recur.
* cause can be ***any inflammatory systemic condition*** (e.g. RA, Sjögren syndrome, coccidioidomycosis, syphilis, zoster, tuberculosis); most often etiology cannot be determined.
* tenderness, irritation, mild photophobia, some lacrimation.

**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:
  + 1. **no treatment**
    2. 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” >>](http://www.atlasophthalmology.com/atlas/frontpage.jsf?locale=en)

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).

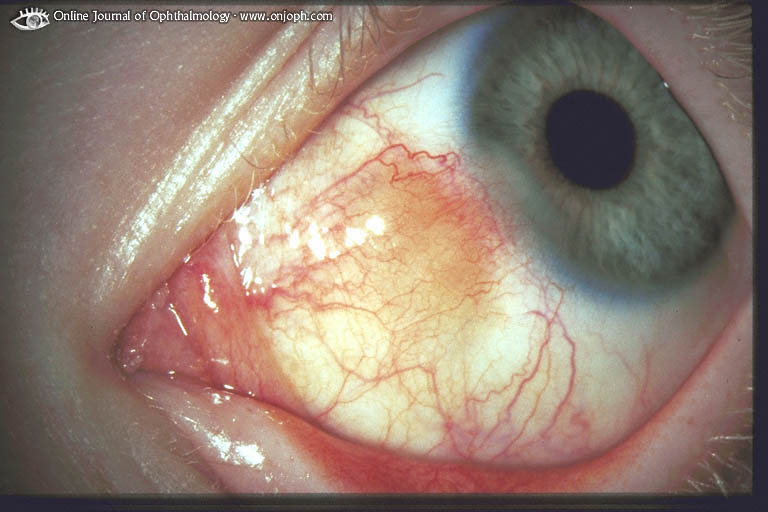
N.B. *necrotizing scleritis in association with RA* → 50% mortality in 10 yr (mostly from MI)!

**necrotizing scleritis** with severe RA; superficial and deep injection:



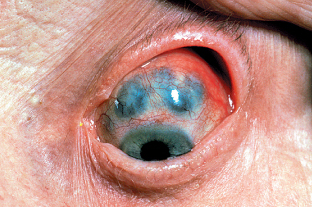
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**nodular scleritis** - elevated, hyperemic, painful:

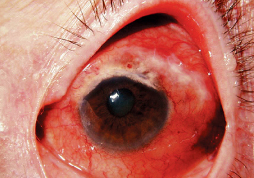


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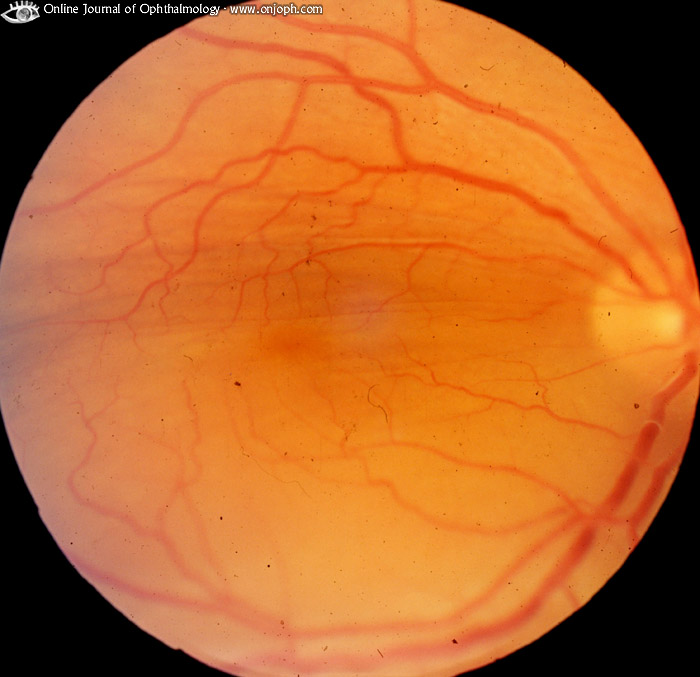
**scleritis and scleromalacia** in RA:



**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” >>](http://www.atlasophthalmology.com/atlas/frontpage.jsf?locale=en)

Treatment

- systemic **corticosteroid**.

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

Bibliography for ch. “Ophthalmology” → follow this [link >>](http://www.neurosurgeryresident.net/Eye.%20Ophthalmology\Eye.%20Bibliography.pdf)

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