

Affections of CONJUNCTIVA in animals

Anatomy and physiology:

- Thin and near transparent mucous membrane.
- Composed of an epithelial layer and a substantia propria.
- Two types: Bulbar and palpebral.
- Bulbar part covers the eyeball except the cornea, reflects at fornix and continues as palpebral conjunctiva which covers the third eyelid and lines the upper and lower eyelids.
- The subconjunctival tissue is areolar in general (except at the tarsal plate and near the limbus).
- Freely movable.
- Substantia propria consists of two layers: The adenoid layer and the fibrous layer.
- The adenoid layer is a fibrous network infiltrated with aggregates of lymphocytes and a few mast cells and histocytes. However this layer is absent in newborn.
- The nerve supply to conjunctiva (as well as cornea) is from 1st and second divisions of the trigeminal nerve. Any irritation or stimulation of these sensory nerves by reflex action initiates tear secretions.
- **Vascularization:** Conjunctiva is highly vascular structure and also the thin and near transparent nature allows easy observation of the blood vessels as well visualization of episcleral vessels. Vessels are more prominent at the fornix and fade out towards the limbus and move with the movement of conjunctiva. Hyperemia of conjunctival vessels is an essential feature of a red eye commonly and erroneously termed “conjunctivitis” but differentiating conjunctival and episcleral hyperemia is essential in assessing the cause and seriousness of a red eye. Such differentiation can be done as follows:

SNo.	Conjunctival hyperemia	Episcleral (Ciliary) hyperemia
1	Vessels more at fornix	More at limbus
2.	Vessels branch profusely	Less branching
3.	Vessels move with conjunctiva	Stationery when conjunctiva moves
4.	Vessels bright red	Deep red to violet
5.	Blood flows from fornix to limbus	Limbus to fornix
6.	Vessels superficial and can cross over the cornea	Vessels stop short of the limbus

Ciliary hyperemia is a common sign in serious disease conditions like glaucoma, uveitis or intraocular neoplasms.

Conjunctival Hyperemia:

1. **Active:** Vessels appear bright red.
2. **Passive:** Vessels appear darker and give strangulated appearance.

Active conjunctival hyperemia: Many causes.

- **Direct irritation:** Wind, dust, light, heat or cold or deficient precorneal tear film.
- **Reflex irritation:** Due to irritation/stimulation of trigeminal nerve, sinus infection or tooth affection.

- **Skin diseases:** Eyelid tumors, blepharitis etc.
- **Local infections:** bacterial, viral, fungal, parasitic etc.
- **Systemic infections:** Canine distemper, African horse sickness, Bovine malignant catarrh.
- **Allergic:** Pollens.

Passive conjunctival hyperemia:

- **Mechanical:** Glaucoma causing pressure on conjunctival vessels; uveal neoplasms
- **Systemic:** Passive congestion in heart failure.

Affections:

1. *Chemosis:*

- Edema of conjunctiva.
- Occurs due to local or systemic allergic reaction.
- Inflammation due to infection or trauma.
- Treated locally using topical corticosteroids.
- Cold application is useful.

2. *Dermoid cyst:*

- Congenital cutaneous growth on the conjunctiva.
- Dark brown to black in color.
- Has number of hair follicles.

Treatment:

§ Surgical excision of the Dermoid is done under general anaesthesia.

§ Suturing of conjunctiva is not required. However if required, simple continuous suturing is done using 4-0 or 5-0 chromic catgut/Vicryl.

§ Topical antibiotics with corticosteroids for 5-7 days postoperatively.

3. ***Conjunctivitis:*** Inflammation of conjunctiva. Careful examination and culture examination of the conjunctival scrapings is very important to rationalize the treatment. Inflammation can be self limiting or protective when there is decreased tear production. Inflammation of conjunctiva leads to many changes in the conjunctiva:

- **Active hyperemia:** Seen in response to any type of the external stimuli.
- **Papillary hypertrophy:** Thickening of conjunctiva and increased vascularity gives conjunctiva a less transparent velvety appearance.
- **Increased Tear production:** Inflammation causes stimulation of goblet cells present in the conjunctival epithelium and there is increased mucous production with proliferation of more goblet cells.
- **Proliferation of lymphoid follicles:** Lymphoid follicles are normally present on the bulbar surface of third eyelid but following conjunctivitis these proliferate and are seen on the palpebral surface also.
- **Increased leukocytic proliferation:** Neutrophilic proliferation is commonly

seen following bacterial conjunctivitis.

Classification:

a. Catarrhal Conjunctivitis:

- There is increased tear production.
- Active hyperemia.
- Chemosis

Etiology:

- All the causes of active hyperemia except local bacterial infection.
- Seen along with entropion, dystichiasis, ectopic cilia.

Treatment:

- Recovery generally seen without any treatment.
- May use antibiotic ointments with corticosteroids to prevent flaring of infection since pathogens are normally present in the conjunctival sac.

b. Follicular conjunctivitis:

Mostly allergic

- There is persistent grayish mucoid discharge – a classical sign of such type if conjunctivitis in otherwise normally looking eye.
- Hypertrophy of lymphoid follicles is a common occurrence.

Etiology:

- § Prolonged irritation of the conjunctiva due to pollens, dust.
- § Any previous infection of lymphoid follicles.

Treatment:

- Debridement of lymphoid follicles is done with a curette or any blunt instrument under suitable anaesthetic technique. Chemical debridement can also be done using 1-2% copper sulfate or 0.5-1% silver nitrate.
- Topical antibiotics with corticosteroid ointments for 7-10 days.

c. Suppurative conjunctivitis: Conjunctivitis developing from some infectious agent.

- There is purulent or mucopurulent discharge.
- There is desquamation of epithelial cells of the conjunctiva.
- Acute purulent conjunctivitis is also seen in newborn puppy before lid separation and is called *Ophthalmia Neonatorum*

Etiology:

- **Infectious (local)** mostly *Staphylococci*, *Streptococci*, *Neisseria*, *Pseudomonas* in dogs and *Mycoplasma*, *Moraxella* in bovines (Infectious bovine kerato-conjunctivitis, IBKC) and *Chlamydia* in sheep .
- **Systemic diseases:** Canine distemper, Infectious bovine rhinotracheitis, Blue tongue virus.
- Later stages of catarrhal conjunctivitis.

- May be seen in association with dacrocystitis, eyelid deformities.

Diagnosis: Culture the discharge after proper swabbing.

Treatment:

- Thorough flushing using 2% Boric acid/NSS.
- Topical antibiotic ointments qid for 8-10 days.
- In chronic cases chemical cauterization may be done using 0.5-1% silver nitrate followed by prolonged antibiotic therapy after proper CST.

d. **Mycotic conjunctivitis:** Conjunctivitis caused by a fungus.

- Characterized by black dry exudates when *Aspergillus*.
- Characterized by presence of white to yellow discharge when *Candida*.

Diagnosis: Take scrapings of conjunctiva and using methylene blue examine for the presence of the fungus.

Treatment: Use topical antifungal ointments

- Nystatin for candidiasis
- Myconazole for aspergillosis.
- Amphotericin B – Broad spectrum

Topical application Bid for 3-4 weeks.

e. **Parasitic conjunctivitis:** Mostly due to *Thelazia californiensis*, *Thelazia gulosa* and *Thelazia skrjabini* seen in all the species.

- Typical white threads like structures (parasites) are seen in the conjunctival sac.
- Epiphora, hyperemia and sometimes mucopurulent discharge are common clinical signs.

Diagnosis: Parasites can be seen under 2.5X magnification.

Treatment:

- Mechanical removal of the parasites by flushing or with the forceps after topical anaesthesia.
- Topical antibiotics with corticosteroids for 7-8 days.

4. **Conjunctival wounds/foreign bodies:**

- Very common in dogs due to the foreign bodies like weed seeds, awns mostly adhering behind the third eyelid.
- Mostly associated with mucoid discharge and ocular discomfort.
- Mostly tears of the conjunctiva are seen.

Treatment:

§ Flushing with 2% boric acid/NSS.

§ Removal of foreign bodies using thumb forceps under topical anaesthesia.

§ Wounds heal quickly without any treatment because of high blood supply.

§ If tears are large, suture using 4-0 or 5-0 chromic catgut/Vicryl

under general anaesthesia applying simple continuous suture pattern.

§ Topical antibiotics with corticosteroids for 7-8 days postoperatively.

5. *Conjunctival Burns:*

- Mostly develops due to hot liquids, acids or alkali.
- Most common etiological factor is lime particle.
- Acid burns are generally superficial due precipitation of the protein layer.
- Alkali burns are deep as alkali dissolves the protein layer. Such burns mostly lead to the development of symblepharon affecting the movement of eyelid movements.

Treatment:

§ Flushing of affected eye is done to remove the lime particles.

§ Neutralization of lime particles can be done using 5% ammonium carbonate.

§ Repeat flushing with NSS.

§ Topical antibiotics with corticosteroids for 8-10 days.

§ Topical anaesthesia can be used to take care of pain.

6. *Pterygium:*

§ Degenerative condition of conjunctiva characterized by presence of flat triangular prominence on the conjunctiva due to chronic irritation.

§ Heavily vascularized.

§ Interferes with eyeball movement.

Treatment:

§ Surgical excision is done under general anaesthesia.

§ Conjunctival wound is closed applying simple continuous pattern using 4-0 Or 5-0 chromic catgut.

§ Postoperative antibiotics with corticosteroids.

7. *Neoplasm:*

§ Less common than neoplasms of lid or skin.

§ Most common is squamous cell carcinoma.

§ Mostly seen in horses and cattle, rare in dogs.

§ Other less common tumors are haemangioma, haemangiosarcoma and melanocytoma.

§ Tumors have been reported to develop from solar irradiations.

Treatment:

§ Surgical excision under general anaesthesia or regional block as per the animal.

§ Close the conjunctival wounds using 4-0 or 5-0 chromic catgut.

§ If metastatic removal of whole eye is recommended.

§ Postoperative antibiotics with corticosteroids.

