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ANTERIOR CHAMBER AFFECTIONS

The anterior chamber is the space formed anteriorly by the cornea and posteriorly by the iris and is filled with aqueous humour. The filtration angle lies between the iris and cornea.

The anterior chamber is examined for its depth (either deep or shallow) and contents. Also the filtration angle is examined by gonioscopy.

I-SHALLOW ANTERIOR CHAMBER: -

Causes:

- 1-Anterior displacement of the lens forcing the iris forward and reducing the size of anterior chamber
- 2-Posterior synechia. When the edges of the iris are sealed to the lens in a complete circular ring, the aqueous humour cannot pass to the anterior chamber and causes pressure over the iris forward resulting in iris bombe.
- 3-Tumor of the iris
- 4-Corneal perforation and loss of aqueous humour.

II-DEEP ANTERIOR CHAMBER: -

- 1-Congenital microphakia (small lens)
- 2-Buphthalmia in chronic glaucoma

III-ABNORMAL CONTENTS OF THE ANTERIOR CHAMBER: -

Normally the anterior chamber contains aqueous humour. With bright focal beam of light, a faint reflex is seen along the path of light as a result of the light



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reflected from very minute particles suspended in the aqueous. In uveitis, large particles are present and reflect light in a fashion of searchlight beam at night.

1-Hypopyon: -

Definition:

Inflammatory exudates or pus in the anterior chamber

Causes:

1-Ulcerative keratitis 2-Anterior uveitis

Symptoms:

The inflammatory exudates settle to the lower part of the anterior chamber. In corneal ulceration, the hypopyon may have a roughly triangular shape with part of it adherent to the corneal ulcer.

Treatment:

Is directed first to treat the cause

1-Medical treatment by Alphachemotrypsine

2-Paracentesis and aspiration of the hypopyon by using sterile needle

3-Removal of the hypopyon through a stab puncture at the limbus by broken razor blade or cataract knife. The clotted exudates are removed by iris hook and the wound is sutured by simple interrupted stitches. The anterior chamber is reformed by antibiotic solution.

2-Hyphaema: -

Definition:



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Hemorrhage or blood in the anterior chamber.

Causes:

- 1-Direct trauma by penetrating foreign body as thorn, stick or buckshot or indirect by severe blows to the eyeball or head
- 2-Iridocyclitis frequently produce hyphaema
- 3-Infectious disease as equine periodic ophthalmia
- 4-Chronic glaucoma especially when the eyeball increased in size (Megaloglobus). The hemorrhage may originate either from the ciliary body or from retinal detachment and is usually unclotted.
- 5-Primary and metastatic anterior uveal neoplasms as malignant lymphoma and haemangiosarcomas
- 6-Retinal vascular disease may produce hemorrhage and accompanied or not by retinal detachment.
- 7-Anterior chamber paracentesis. The iris is usually the source of hemorrhage.

Treatment:

- 1-Correction of the primary cause
- 2-Hemorrhage due to trauma usually clear up in 24 hours without treatment
- 3-Topical application -of 1-2% epinephrine solution for 24 hours only and then apply atropine to dilate the pupil until all hemorrhage has disappeared.
- 4-Injection of fibrinolysin enzyme intracameral to remove blood clot



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5-Surgical removal of the clot is rarely indicated. Small limbal incision can be performed and the clot is hooked to an iris hook to bring it out.

3-Fibrin (plasmoid aqueous): -

Fibrin escape into the aqueous humour in cases of anterior uveitis and in such conditions resulting in reduction of intraocular pressure such as intraocular surgery, perforating wound, and paracentesis

Symptoms:

The fibrin clot may adhere to the cornea resulting in leucoma or to the lens and iris resulting in synechia and iris bombe. Also it may obliterate the filtration angle and cause glaucoma.

Treatment: Treat the cause

Injection of fibrinolysin intracameral

4-Lipid aqueous: -

Presence of lipids and lipoproteins in the aqueous humour is correlated with hyperlipaemia in dogs. The blood aqueous barrier appears to be destroyed by iridocyclitis and permit the entrance of lipid into the anterior chamber. The fat droplets in the aqueous give it a milky appearance. This can fill the lower part of the anterior chamber or the entire anterior chamber.

Treatment:

Low fat diet and thyroid therapy will clear up the aqueous within a week.

5-Lens: -



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It may be luxated into the anterior chamber or ruptured and its material is mixed with the aqueous humour.

Treatment:

Removal of luxated lens.

6-Abnormal growth: -

Several types may be present such as:

1-Anterior uveal tumour (lymphosarcoma and melanomas) 2-granuloma. It is usually fibrin clot

3- Iris or ciliary body cyst

Treatment:

Surgical

7-Parasites:-

Migrating heart worm in dogs may gain access to the anterior chamber or flaria larvae in horses.

Treatment:

Parasites are removed surgically and the animal is treated by antiparasitic drugs

8-Foreign bodies: -

Thorns and birds shot (shotgun pellets). Such foreign bodies are removed surgically.



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LENS AFFECTIONS

Lens is a transparent, avascular, biconvex structure derived solely from epithelial cells. The function of the lens is to refract light rays onto a small area of retina to produce a sharp visual image. The lens is maintained in position by ciliary zonules (suspensory ligament). It consists of about 120 fibers that arise from the surface of the ciliary epithelium to the lens capsule at the equator. The shape of the lens changes by contraction or relaxation of ciliary musculature. Diseases of the lens can be categorized into 4 groups:

1- Loss of accommodative power. 2- Congenital defects.

3- Decreased transparency (cataract). 4- Abnormal position (subluxation and luxation).

I- Loss of Accommodation: -

Loss of accommodation has not been clinically estimated in domestic animals, but the condition does occur. Lack of clinical symptoms may not be due to poor accommodations but due to depending of these animals on other sensory systems as smell, touch, and hearing. Hence, total removal of the lens does not result in a great degree of functional disability and many animals exhibit normal clinical vision with aphakia.

II- Congenital Defects: -

1- Aphakia: -

Congenital absence of the lens.

2- Microphakia: -

Abnormal small size of the lens.



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3-Lenticonus and lentiglobus: -

It is a congenital anomaly in the shape of lens. Lenticonus" is anterior or posterior protrusion of the lens in a conical contour and lentiglobus in a spherical contour.

4-Coloboma of the lens: -

Segment of lens is absent.

5-Persistent pupillary membrane: -

Is the presence of remnants of the pupillary membrane. The strands extend to the anterior surface of the lens.

6-Persistent hyaloid vasculature: -

Remnants are attached to the posterior lens capsule.

III-Cataracts (loss of transparency, or opacity of the lens and/or its capsule)

Classifications:

1-According to the degree of maturation: -

A-Incipient cataracts: -

This is the stage of beginning opacity. Incipient cataracts characterized by early cortical vacuolar changes, prominent lens sutures, and minute subcapsular alterations. Sight is still normal.

2-Immature cataracts: -

The lens is markedly increased in size due to imbibition of fluid (intumescent) that results in complete opacification within days or weeks. The enlargement of the lens leads to splitting and separation of the lens suture lines and formation of Y-shaped fissures. The sight is impaired but the fundic light reflex is still present.



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3-Mature cataracts: -

The lens becomes totally opaque and the vision is lost. The fundic light reflex is disappeared and the fundus cannot be visualized with an ophthalmoscope.

4-Hypermature cataracts: -

Some cases of mature cataracts progress to a hypermature stage and undergo additional changes;

a-Shrunken cataracts: -

The lens becomes small, hard and with rough surface. It may pull away from the zonules.

b-Morgagnian cataracts: -

The cortex undergoes liquefaction leading to a milky texture and the lens nucleus gravitates downward. When the head is moved abruptly, the nucleus will float up and then settle down when the movement stopped.

c-Resorption cataracts: -

The liquefied cortical material may leak through the lens capsule and lenticular fragments remain. The escaped liquefied material may results in iridocyclitis because lens protein is foreign to the animal's immune system. This is exhibited by aqueous flare, miosis, lowered intraocular pressure, episcleral congestion and chronic conjunctivitis.

II-According to the age of onset: -1-Congenital cataracts: -

Begin during fetal life and present at birth and may be stationary or progressive. They are noticed before 2 weeks of age in calves and colts and by 8 to 12 weeks in dogs. Congenital cataracts are observed secondary to or associated with other ocular developmental abnormalities such as; persistent pupillary membrane, persistent hyaloid artery, microphthalmia and multiple ocular abnormalities.



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2-Juvenile cataracts (developmental cataracts): -

Usually develop during early years of life between 1-6 years age. They may be genetic, nutritional, inflammatory, toxic or secondary to radiation.

3-Senile cataracts: -

They are part of the aging process and occur in all species of domestic animals in advanced age. They are of great clinical importance in dogs and horses and then cats and bovine. Nuclear sclerosis is a common lenticular changes in senile cataracts. It is considered a normal aging change associated with compression of peripheral lens epithelial fibers towards the nucleus of the lens. This process is analogous to keratinization of the skin except that in the lens, cells are retained rather than exfoliated.

III- According to the part of the lens involved (location): -1-Capsular cataracts: -

The lens capsule is a homogeneous membrane surrounding the lens and consists of an outer zonular lamella or pericapsular membrane and deep cuticular lamellated layer. The capsule provides insertion for zonular fibers and owing to its elastic nature, it plays a major role in accommodation. The capsule maintains the lens integrity and regulate the movement of nutrients and waste products between the lens, the aqueous humour and vitreous body. It varies in thickness, increasing anteriorly and at the equator. The anterior capsule is subjected to laceration and tearing due to penetrating foreign body or severe trauma. The capsule usually curl when it is torn and the underlying lens fibers swell with fluids resulting in focal cataracts. More lens fibers may be involved and complete cataractous lens will result. Capsular tear may be associated with posterior synechia which may close the wound. Lens contusion without tearing may affect the permeability of the capsule resulting in increased fluid uptake and cataractous formation. Deposition of pigments on the anterior capsule is associated with persistent pupillary membrane, surgical manipulation of the iris and intraocular inflammation. Opacities involving the posterior lens capsule are usually associated with persistent hyaloid artery (Mittendorf's dot).



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2-Subcapsular cataracts: -

They occur beneath the anterior lens capsule, a single layer of cuboidal epithelial cells is present. These cells may proliferate due to trauma or toxic insults resulting in focal subcapsular cataracts.

3-Cortical cataracts: -

Cortical changes are usually present at the anterior, posterior or equatorial cortex. A variety of cataractous changes including vacuoles, water clefts and spoke-like opacities are present.

4-Nuclear cataracts: -

They are most frequently congenital and bilaterally recorded. Significant visual impairment may occur if the opacity is dense.

5- Total cataracts: -

IV-According to the cause: -

1-Inherited cataracts: -

These types of cataracts may be not associated with other ocular disease, associated with progressive retinal atrophy, or accompanied with multiple ocular defects.

2-Traumatic cataracts:

Trauma to the globe may result from crushing against hard object. A faring of the lens capsule and/or disinsertion of the suspensory ligaments may then occur. Foreign bodies (glass, shotgun pellets and thorns) may penetrate the lens capsule and disrubb cortical material. Escaped lens material usually results in endophthalmitis which is exhibited by severe pain,epiphora, conjunctival congestion, miosis, aqueous flare, uveitis, posterior synechiae and low intraocular pressure.



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3-Metabolic cataracts (Diabetic cataracts): -

Diabetes mellitus is responsible for cataract formation in dogs. Development of cataractous changes is usually associated with alteration of certain osmotic factors. Cataracts in animals can be induced experimentally by the ingestion of excessive levels of lactose, galactose, and xylose.

4-Toxic cataracts: -

Several toxic substances can produce cataractous changes when administered systematically such as naphthalene and dinitrophenol.

5-Parasitic cataracts: -

Ocular filariasis may be the cause of cataract in some species of animals with other ocular manifestation.

Treatment:I-Medical treatment: -

Several medical treatment regimes have been proposed for cataract resolution in dogs:

1-Selenium-tocopherol injections

2-Sulphadiazine

3-Horse serum extract injected intramuscularly following the injection of a cytolyzed culture of *Actinomyces bovis*

The results of medical treatment are highly subjective due to the problems of interpretation of the results.

II- Surgical treatment: -

Numerous surgical techniques for treatment of cataract have been proposed; intracapsular extraction, extracapsular extraction; discission/aspiration; and phacoemulsification.



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1-Extracapsular extraction: -

This method is the standard and most popular method of lens removal in dogs. In this technique the anterior lens capsule, the lens cortex and the 'nuclear material are extracted and only the posterior lens capsule remains intact. The presence of posterior capsule prevent the occurrence of anterior vitreous presentation. There is a strong attachment between the posterior capsule and the hyaloid membrane. The only main disadvantage of this technique is the escape of the liquified lens material into the aqueous humour resulting, in postoperative iridocyclitis. Also posterior capsule may be opaque or may lose its transparency following surgery.

The technique:

- Lateral canthotomy is usually performed to enlarge the small palpebral fissure.

- Lid speculum is used to retract the eyelids for proper surgical exposure.

Sometimes stay sutures are used to stabilize the globe during surgery (4-0 to 6-0 silk, or nylon).

- Conjunctival flaps:

Two types of conjunctival flaps are used; limbal based flap and fornix based flap

- Entry into the anterior chamber is performed through one of the three basic anatomic incisions; limbal, corneal or scleral. Corneal and limbal ones are better than scleral one, which is usually accompanied by profuse hemorrhage.

- Removal of anterior lens capsule.

- Removal of the cortex and nucleus.

- Closure of the corneal or limbal wound. Preplaced sutures with limbal-based conjunctival flap are not uncommon in dogs.



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-Conjunctival incision closure.

2-Intracapsular extraction: -

It is the same as extracapsular except that the lens is completely removed. The lens is delivered within an intact lens capsule. Before lens removal, zonulolysis of the suspensory ligament is tried using alphachymotrypsin as a zonulolytic enzyme. The lens can be removed using forceps either by tumbling or sliding and can also be removed by cryoextraction.

3-Phacoemulsification (phacofragmentation): -

It is the use of high frequency vibrations to fragment and emulsify the lens into a solution or emulsion and its aspiration through the anterior chamber. Ultra-sonic energy has been used to break down the lens material.

4-Discission and aspiration: -

It is performed in small animals when the lens material is soft enough to allow aspiration. The anterior lens capsule is penetrated and the content is aspirated. A small limbal incision is sufficient to introduce the aspiration needle.

Postoperative complications:

1-Corneal ulceration 2-Corneal oedema 3-Surgical wound leakage 4-Secondary glaucoma

5-Uveitis 6-Anterior vitreous presentation 7-Bacterial endophthalmitis 8-Retinal detachment.

IV- Lens displacement: -Displacement of the lens results from partial or complete breakdown of the suspensory ligaments.

Causes:



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1-Congenital 2-Traumatic

3-Secondary to intraocular tumours, glaucoma and hyper-mature cataracts.

Classification:

1-Subluxation of the lens:

The displaced lens remains in the patellar fossa behind the iris.

2-Luxation of the lens:

Means complete displacement of the lens from the patellar fossa. It may be anterior luxation or posterior luxation. In anterior luxation the lens may force the iris forward or pass through the pupil to the anterior chamber of the eyeball. Posterior lens luxation is usually tolerated and may result in secondary vitreous absorption.

Treatment:

Removal of the lens especially in non-complicated cases

ANTERIOR UVEAL (IRIS and CILIARY BODY) AFFECTIONS

I-CONGENITAL ABNORMALITIES OF ANTERIOR UVEA: -

1-Persistent pupillary membranes: -

Definition:

It is a remnant of the pupillary membrane, which closes the pupil during fetal life, in a form of pigmented or non-pigmented strands. In the fetus, the pupil is closed with a thin pupillary membrane that starts to be absorbed directly before birth. When absorption is not complete a strands are formed, these strands may dissappear 4-5 weeks after birth.



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Signs:

1-These strands may extend from one part of the iris to another, from the iris to the lens or to the cornea, or it has free end.

2-Strands from iris to cornea may cause corneal opacity and strands from iris to lens may produce cataract but those from iris to iris have no clinical signs.

Treatment:

This condition does not reduce functional vision significantly and thus does not require surgical intervention.

2-Iris coloboma, Iris hypoplasia, or Iris atrophy: -

Definition:

Iris coloboma is a full thickness defect of the iris.

Signs:

1-The defect may be confined to the base of the iris (iridodiasis) or may involve a portion of the pupillary margin and form a notch giving the pupil a "dumbbell" shape. The number of defects varies and in some cases the colobomata are so numerous that the iris has the appearance of spider web.

2-The colobomata changes in shape as the pupil is constricted or dilated.

Treatment:

Functional vision of the animal is not significantly involved therefore treatment is not indicated

3-Iris cyst: -



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Definition:

Cysts of the iris arise from the pigmented epithelial layer of the iris and ciliary body. Most of them are congenital and some are acquired due to iris irritation and degeneration.

Types:

A-Pupillary cyst: -

It is originating from the pupillary margin of the pupil. This type is common in dogs. Large ones may anchor to the corneal endothelium and produce local corneal edema. Surgical removal is not recommended unless causing corneal irritation.

B-Posterior chamber cyst: -

Originates from the posterior surface of the iris and is not seen until the pupil is dilated. Treatment is not recommended.

C-Stromal iris cyst: -

Present in the iris stroma it self. It is common in equine. It may be single or multiple and located near the base of iris. Trans-illumination clarifies its hollow appearance. Treatment is not recommended.

D-Vitreous cyst: -

Originate from the ciliary body and usually develop between the lens and vitreous humour. No treatment is recommended.

E-Free cyst: -



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It is detached from the iris and float freely in the anterior or posterior chamber. It can affect the aqueous flow and its removal in such case is recommended. Also the cyst can be aspirated through a limbal paracentesis using a fine needle.

4-Heterochromia: -

Definition:

It is the presence of a difference in the color of the iris in both eyes or part of one iris has a different color. The difference in color may be hypopigmentation or hyperpigmentation. It is a common affection in buffaloes and need no treatment.

5-Aniridia: -

Total absence of iris

6-Polycoria: -

Presence of more than one pupil

7- Ancoria: -

Absence of pupil

8-Dyscoria: -

Abnormal shape of the pupil.

II-ACQUIRED DISEASES: -

1-Anterior uveitis: -Definition:

It means inflammation of the iris and ciliary body (anterior uvea)

Causes:



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The determination of the exact cause of anterior uveitis is considered to be one of the most difficult problems in ophthalmology

A-Exogenous causes: -

Direct trauma to the eye or the introduction of infection by perforating wounds. Intraocular surgery may produce some degree of anterior uveitis.

B-Spreading of inflammation from other parts of the eye: -

Deep and ulcerative keratitis has concurrent anterior uveitis.

C- Specific disease: -

Dogs (Infectious hepatitis, leukemia and heartworms)

Cats (Infectious feline peritonitis, feline leukemia and toxoplasmosis)

Equine (Leptospirosis, brucellosis and *Onchocerca cervicalis*)

Bovine (Malignant catarrhal fever, and Pink eye)

Sheep and goat (*Mycoplasma*)

D-Hypersensitivity: -E-Presence of a primary focus of infection in the animal body: -

Infection goes through the blood stream sensitizing the anterior uvea (tonsils, teeth, anal sacs and prostate).

F-Idiopathic: -

In many cases the cause cannot be determined.

Symptoms:



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Anterior uveitis may be acute or chronic, unilateral or bilateral. If the cause is a systemic disease it is usually bilateral and if the cause is hypersensitivity it is usually unilateral

1-Blepharospasm, excessive tearing, eye rubbing and conjunctivitis.

2-Circum-corneal injection of the conjunctival and ciliary blood vessels

3-Cloudy cornea

4-Abnormal contents of the anterior chamber. It starts out as increased aqueous flare then hyphaema, fibrin clots and hypopyon may be observed.

5-Iris changes, as the iris becomes rough, dull in color and swollen in appearance. The pupil is constricted due to exhaustion of the dilator muscles. The more acute the lesion, the more severe the miosis. The superficial blood vessels of the iris become congested and may give a red appearance to the iris.

6-Posterior synechiae may develop due to adhesion of the iris to other structures mainly to the lens. Focal adhesion will result in an irregularly shaped pupil and opacity of the lens capsule. Adhesions may prevent aqueous flow into the anterior chamber and the iris bulges (iris bombe), the filtration angle is obliterated and secondary glaucoma develops.

7-Intraocular pressure is hypotonic in early cases then hypertonic in later stages due to obstruction of the filtration angle by fibrin clot or hypopyon.

Treatment: -

1-Mydriatics:

1% atropine solution is the drug of choice. It is beneficial in that it is mydriatic, cycloplegic and decongests the iris



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2-Anti-inflammatory drugs:

Cause inhibition of the immune mediated uveal response and reduce uveal congestion. Corticosteroids are given systematically, topically and subconjunctivally.

3-Antibiotics:

Less important than atropine and corticosteroid therapy

4-Supportive treatment by keeping the animal in dark room and application of worm compresses

Complications:

- | | |
|---------------------------------|----------------------|
| 1-Peripheral anterior synechiae | 2-Posterior synechia |
| 3-Cataract | 4-Glaucoma |

2-Equine periodic ophthalmia, Equine recurrent ophthalmia, or Moon blindness: -

Definition:

Moon blindness has been recorded as early as the fourth century AD. The recurrent nature of the disease has long been recognized and associated with changes in the lunar rotation. The disease is common and an incidence up to 12% has been recorded in eastern areas of the United States. There is no age, sex or breed predilection.

Causes:



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The condition is probably hypersensitivity. Any disease capable of producing chronic or recurrent sensitization of the vascular tunic of the eye must be considered.

- | | | |
|---|-------------------------|----|
| 1-Deficiency of vitamins A, B, and C
Brucellosis | 2-Leptospirosis | 3- |
| 4-Streptococcal hypersensitivity | 5-Onchocerca cervicalis | |

Symptoms:

Moon blindness is the most common cause of blindness in horses and mules.

- | | |
|---|----------------------------|
| 1-Blepharospasm and photophobia | 2-Catarrhal conjunctivitis |
| 3-Circum-corneal ciliary injection | 4-Cloudiness of the cornea |
| 5-Aqueous flare, hyphaema, and hypopyon | 6-Miosis |
| 7-Anterior and posterior synechiae | 8-Complicated cataract |
| 9-Retinal edema or detachment | |

Treatment:

- 1-Mydriatics, topical atropine to relieve the ciliary spasm and dilate pupil
- 2-Antibiotics, antihistamines and vitamins have little effect on the course of the condition.
- 3-Anti-inflammatory agents are administered parenterally, topically and subconjunctivally.
- 4-Additional therapy can be used according to the cause.



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The database that may be informative for differentiating known uveitis etiologies includes: CBC, BUN, enzymes, total protein, electrophoresis, toxoplasmosis titer, leptospirosis liter, viral antibody titers, conjunctival biopsy, anterior chamber paracentesis and a stool sample for parasites.

3-Anterior uveal tumors: -

Iris tumors can be detected easily before they become extensive, but ciliary body tumours are seldom diagnosed until they cause serious damage to the eye. Small iris tumors can be surgically removed. Massive tumors of the iris and ciliary body should be treated only by removing the eye.

CONJUNCTIVAL AFFECTIONS

I-CONGENITAL ANOMALIES OF THE CONJUNCTIVA: -

1-Dermoids: -

Definition:

It is a congenital tumour may involve the conjunctiva alone, eyelids or cornea. The tumour mass is dark brown to black in color and covered with a variable number of long hairs. Surgical excision of the mass is indicated. Conjunctival wound can be left unsutured in small defects but should be sutured if extensive.

2- Ectopic cilia: -

Definition:

It is one hair or clusters of hairs that originate at the conjunctiva. It is usually developed several months to several years after birth. Ectopic cilia may be congenitally misdirected hair follicle that produces hairs.

Signs:



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1-Epiphora, blepharospasm and mucoid discharge are evident.

2-A small dark red and slightly raised part of the conjunctiva may surround the cilia.

Treatment:

Electroepilation with destruction of the hair follicles

II-ACQUIRED DISEASES OF THE CONJUNCTIVA: -

1-Conjunctivitis: -

Definition:

It is inflammation of the conjunctiva.

General signs of conjunctivitis:

1-Active hyperaemia; vascular injection of the conjunctival blood vessels

2-Chemosis; oedema of the conjunctiva. Thickening of the conjunctiva may become so severe that bulbar conjunctiva extends over the cornea and beyond the edges of the eyelids.

3- Ocular discharge; usually starts as serous and becomes mucopurulent and purulent

4- Follicles; it is normally present on the bulbar surface of the third eyelid. The development of these follicles on the outer surface of the nictitating membrane or bulbar and palpebral conjunctivae, in addition to its proliferation at the normal sites is considered a diseased condition.

5-Pain; may be mild or severe depending on the cause. Blepharospasm or spastic entropion may result.



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Etiology:

1-Mechanical causes: -

A-Exogenous irritative factors such as; foreign bodies, dust, sand, owns, husks, dried leafs, hair, eyelash, smoke, bright sunlight and low humidity.

:

B-Endogenous factors such as; deficiency of precorneal tear film, entropion, ectropion, distichiasis, trichiasis, ectopic cilia, prominent nasal folds, lagophthalmos, exophthalmos and eyelid tumors.

2-Chemical causes: -

A-High percentage of ammonia in stable air due to bad ventilation

B-Gases such as sulphur fumes and formaline vapor in cases of stable disinfection.

C-Eye lotions or ointments applied to the eye in higher concentration.

D-Acids and alkalies burns: Alkalies have a more destructive effect than acids. Acids causes precipitation of protein which act as a barrier against further penetration and destruction.

E-Chalky materials used to beautify the animal coats during exhiption.

3-Traumatic causes: -

A slight injury such as cat scratches and abrasions may act as a primary cause or may provide a point of entrance of microorganism.

4-Infection: -

May be restricted to the eye or part of a systemic disease.



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A-Bacterial B-Viral C-Mycotic D-Mycoplasma E-
Chlamydia F-Rickettsia.

5-Parasitic causes: -

A-Genus thelazia: Reported in all domestic animals. Usually cause mild conjunctivitis and epiphora.

B-Onchocerca cervical is in horses
horses

C- Habronima larvae in

D-Face flies in horses and cattle.
dogs.

E-Demodectic mange in

6-Allergic causes: -

A- Pollen grains
animals

B-Type and quality of hay in large

C-Conjunctival sensitivity against special antibiotics as penicillin or neomycin.

7-Systemic diseases: -

Conjunctivitis occurs in the course of some infectious diseases such as canine distemper in dogs; feline catarrh in cat; malignant catarrhal fever, infectious bovine rhinotracheitis and infectious

bovine keratoconjunctivitis in cattle; equine influenza in horses; or disease in sheep and swine fever in pigs.

8-Difficiency causes: -

Vitamin A difficiency causes degeneration of lid conjunctival epithelium.

9-Iodism: -



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In cases of treatment of actinomycosis by using potassium iodide.

10-Old age and debility: -

Classification:

Conjunctivitis is classified according to the clinical symptoms into;

- A-Catarrhal conjunctivitis B-Purulent conjunctivitis. C-Parenchymatous conjunctivitis
- D-Follicular conjunctivitis. E-Ophthalmia neonatorum.

A-Catarrhal conjunctivitis: -

Definition:

It is catarrhal inflammation of the conjunctiva, which characterized by increased tear and mucous production

Signs:

- 1-Increased flow of tears (epiphora) that soon starts to run down the face of the animal. In the earlier stages, these are watery, clear and saline in character. Next the discharge becomes mixed with mucoid secretion and becomes sticky, thick and gelatinous
- 2-Thickening and edema of the conjunctiva (Chemosis)
- 3-The eyelids are inflamed and swollen. The edges may be gummed together with exudates.
- 4-Blepharospasm and photophobia

Treatment:



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- 1-Thorough examination and elimination of the cause if present
- 2-Washing the eyeball and conjunctival sac for removal of discharges using warm normal saline solution or boric acid solution 2%.
- 3-Antibiotics; the drugs are chosen for their effectiveness on the tear film and no need for penetration of epithelium.
- 4-Corticosteroids (Anti-inflammatory drugs).
- 5-Antihistaminics (Anti-allergic drugs).

B- Purulent conjunctivitis: -

It is purulent inflammation of the conjunctiva. The main cause is bacterial infection, but other causes of conjunctivitis cannot be neglected. Purulent conjunctivitis can be artificially induced by mallein test and tuberculin test.

Symptoms:

- 1-The eyelids are swollen, edematous and stucked together.
- 2-The conjunctiva is red, swollen and edematous.
- 3-The discharge at first is like meat-juice and consists of serum, fibrin, inflammatory cells and flacks of pus. Later on becomes purely purulent and comes continuously from the medial canthus of the eyeball.

Treatment:

- 1-Elimination of the cause
- 2-Thorough washing of the eyeball with cleansing solution. Make sure special tests have been completed (culture and Schirmer tests) before irrigation with cleansing solutions.



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3-Antibiotic Ointment is applied 2-4 times daily or solutions instilled at least 4 times for 7 days. Broad spectrum antibiotic is used. Combinations of different antibiotics are more useful otherwise sensitivity test is performed first. Treat the least affected eye first and sterilized eye dropper

is used for instillation of drugs.

4-Anti-inflammatory; corticosteroids can be used.

C-Parenchymatous conjunctivitis:

Definition:

It is inflammation of the deeper layers of the conjunctiva. It is mostly considered to be a higher degree of simple catarrhal conjunctivitis.

Symptoms:

1-Severe swelling of the conjunctiva specially the bulbar one (chemosis) The bulbar conjunctiva extends over the cornea covering the limbus and the palpebral conjunctiva extends beyond the eyelid margin.

2- Serous or mucoid discharge

Treatment:

1-The same treatment for catarrhal conjunctivitis

2-Warm compresses applied to the closed eye will reduce the swelling of the conjunctiva dramatically.

D-Follicular conjunctivitis: -

This type of conjunctivitis is characterized by presence of hypertrophied lymphoid follicles at the bulbar surface of the third eyelid and perhaps on the



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palpebral surface and on the palpebral conjunctiva of the upper and lower eyelids. Lymphoid follicles are located normally on the bulbar surface of the nictitating membrane in all domestic animals. The follicles are essential for the mechanism of controlling ocular infection. Any chronic irritation or immunological stimulant will stimulate them to become hyperplastic. A new follicles will develop anywhere on the conjunctiva. After the follicles have been formed they will sustain themselves even if the initiating cause disappeared.

Causes:

1-Prolonged ocular irritation specially mechanical causes either exogenous (dust, winds, etc ...) or endogenous (entropion, ectropion, distichiasis, etc ...).

2-Immunological stimulus includes pollen grains and migrating parasites.

3-Previous infection as in cases of bacterial conjunctivitis since these lymphoid follicles are centers of antibody production. In 25% of 'cases of follicular conjunctivitis in dogs, inclusion bodies like that isolated in cases of trachoma in human beings was discovered. This indicates that viral infection may be incorporated in such disease.

Symptom:

1-Persistent grayish mucoid discharge at the medial canthus of the eye.

2-Examination of the bulbar surface of the nictitating membrane revealed presence of a red, roughened appearance of the hyperplastic lymphoid follicles. The follicles may present elsewhere in all conjunctival surfaces.

Treatment:

1-Removal of any predisposing causes.

2-Mild cases can be treated by antibiotic-steroid therapy.



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3-Removal of the follicles from the bulbar surface of the nictitating membrane by one of the following methods;

a-Debriding (scraping or curetting) of the follicles with a dull blade curette, end of the scalpel handle or any blunt instrument. Then apply zinc sulphate 1/2% solution as astringent. This treatment is followed by 7-10 days topical corticosteroid antibiotic ophthalmic ointment.

b-Cauterization of the follicles with copper sulphate crystals or silver nitrate sticks. Grasp the third eyelid with a mosquito artery forceps, evert the membrane on the forceps and start cauterization. Scraping sometimes is recommended before cauterization. Flush the third eyelid and the eyeball with normal saline and apply a liberal amount of ophthalmic ointment between the third eyelid and the eyeball. Copper sulphate causes severe corneal damage therefore do not allow it to touch the cornea and be sure to flush adequately after cauterization. Antibiotic-cortizone ophthalmic preparations are used for 5 days.

4- Individual follicles elsewhere in the conjunctiva don't scrape it or use cauterization, as it will result in an adverse reaction. Try to use electrocauterization of each follicle or remove each one with scissors.

N.B.:

Surgical excision of the third-eyelid is not recommended, as a treatment for follicular conjunctivitis as the disease, is much more distressing to the owner more than to the patient and therefore the treatment is optional. In addition, complications from third eyelid excision add to much stress on the animal than do follicular conjunctivitis itself.

E-Ophthalmia neonatorum: -

Definition:



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Acute purulent conjunctivitis of newly born puppies and kittens before eyelids separation takes place. The purulent discharge builds up beneath the lids causing them to swell and may extrude at the medial canthus of the eye.

Treatment:

- 1- Separate the lids with blunt tenotomy scissors
- 2- Wash the eyeball with cleansing solution
- 3- Apply broad-spectrum antibiotics

2-Conjunctival wounds and laceration: -

Causes:

- 1- Cat scratches, bite wound, and fighting in small animals
- 2- Blows on the eye or penetrating foreign bodies or gunshot wound in all animals.

Symptoms:

- 1- Bloody tears of the third eyelid.
- 2- Blepharospasm
- 3- Protrusion
- 4- Presence of wound or laceration of the conjunctiva with swelling and edema of the wound edges

Treatment:

The conjunctiva heals rapidly if uncomplicated by infection. Torn bulbar conjunctiva adheres very quickly to the episcleral tissues within few hours and complete healing takes place within 24 hours.



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1-Lacerations of the bulbar conjunctiva heals quickly and need to be sutured only if extensive. Use 6/0 or 7/0 absorbable suture materials with eyeless needle.

2-Lacerations at the fornices: Clean the wound and remove any protruding periorbital fat through the wound before suturing.

3-Lacerations at the palpebral conjunctiva heal without surgical interferences.

In all cases antibiotic ointment is applied to prevent infection.

3-Subconjunctival hemorrhage: -

Subconjunctival haemorrhage usually follows a blunt trauma to the eyeball with or without proptosis and is due to rupture of Subconjunctival (episcleral) blood vessels. Sometimes the blood is migrating anteriorly from periorbital haemorrhage. The extravasated blood is present under the distended bulbar conjunctiva. In some cases subconjunctival haemorrhage may- be due to some systemic bleeding disorder.

Treatment:

1- If the bleeding still present, apply epinephrine 1-2% topically

2-When hemorrhage has stopped; it will recover in most cases without treatment. To hasten recovery corticosteroids may be injected subconjunctivally.

4-Conjunctival tumors: -

Conjunctival tumors are most common in cattle and horses and rare in other domestic animals. The most common tumour in cattle, horse and cats is squamous cell carcinoma. In dogs haernnangioma, papilloma and histocytorna are the most common types.

Treatment:



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Tumors present at the bulbar conjunctiva can be easily excised due to its loose attachment to the sclera and the wound can be closed with fine catgut. Tumour;; present at the palpebral conjunctiva need careful dissection and wound closure.

CORNEAL AFFECTIONS

I-CONGENITAL DISEASES OF THE CORNEA: -

1-Microcornea: -

Definition:

It is abnormally small cornea. Unilateral cases can be easily diagnosed by comparing it with the normal eye. Bilateral conditions can be compared with the standard dimensions in literatures.

Small cornea usually present with microphthalmia.

2-Macrocornea (Megalocornea): -

Definition:

It means large cornea in a globe. Megalocornea is reported is association with congenital buphthalmos due to increased intraocular pressure.

3-Dermoids: -

Definition:

It is skin-like mass present on the cornea and/or conjunctiva.

Treatment:



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Superficial keratectomy is the successful method

4-Coloboma of the cornea: -

Definition:

It means absence of a segment of the cornea. It is a very rare condition.

II-ACQUIRED DISEASES OF THE CORNEA: -

1-Keratitis: -

Definition:

It means inflammation of the cornea. In general keratitis is accompanied by subjective and objective symptoms.

A-Subjective symptoms: -

These signs are slight or severe depending on the type of keratitis.

1-Pain of the cornea. It is exhibited by photophobia and blepharospasm

2- Lacrimation (epiphora)

B-Objective symptoms: -

1-Conjunctival and ciliary injection of the blood vessels:

The conjunctival and ciliary blood vessels around the cornea become injected and engorged with blood. The conjunctival blood vessels appear bright red, dilated, tortuous and movable while ciliary blood vessels are darker in color, straight and not movable.

2-Loss of corneal transparency:



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Usually results either from corneal edema or due to inflammatory exudates which is usually leucocytic infiltration. Edema results when excess water accumulates within the stroma and forces the collagen lamellae apart.

3-Vascularization of the cornea:

The normally avascular cornea may be invaded by different blood vessels as a defensive mechanism against disease or injury. New vessels invade the cornea from the limbus at the level of the pathological lesion. Vascularization of the cornea either *superficial* or *deep*.

**In superficial Vascularization* of the cornea the new blood vessels are present at the anterior third of the stroma under the epithelium. They originate from the conjunctival blood vessels at the limbus. These vessels are bright red in color and tortuous with numerous branching. It may be confined to a segment of the cornea or may extend around the limbus and readily seen making transition from the conjunctiva to the cornea.

**Deep vascularization* is derived from the anterior ciliary branches. They are usually short, straight, non-anastomosing and dark red in color. They occur at the level of the lesion and usually exhibited about the entire peripheral cornea.

4-Ulceration of the cornea:

Corneal ulceration may be superficial or deep and spreading or localized. The extent of ulceration is easily determined by fluorescein dye that stains green all ulcerated and abraded areas.

5-Pigmentation of the cornea:

It is a nonspecific response to inflammation of the cornea, either mild or severe. The pigments are deposited in the epithelium or stroma. It originates from limbal



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melanoblasts that migrate into the stroma directly or with the blood vessels in neovascularization of the cornea.

6-Hypopyon:

It means accumulation of inflammatory exudates at the anterior chamber of the eyeball.

Classification of keratitis:

Keratitis may be classified according to the etiological agents or according to the anatomic structures involved. However, the later classification is easier

A-Superficial keratitis: -

The process of inflammation is limited to the epithelium and superficial part of the stroma.

i-Superficial punctate keratitis: -

Definition:

It is an epithelial and sub-epithelial lesions range in size between fine circular to large white opacities. Evidence of ulceration is present and thus it may or may not stain faintly with fluorescein. There are usually no clinical signs or ocular inflammation. The cause of such condition is not yet clear but it may be associated with long standing keratoconjunctivitis or due to virus infection

Treatment:

No specific treatment is recommended since the lesions leave the cornea within several months to a year. Topical corticosteroids, antibiotics and/or yellow mercuric oxide may be helpful.



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ii-Superficial corneal abscess: -

Abscess formation at the superficial layers of the cornea usually due to trauma, scratches or presence of a foreign body. A green yellowish swelling is usually observed and vary in size from few millimeters to 20 mm

Treatment:

Opening of the abscess and suction of its content followed by curettage will correct the condition. Superficial keratectomy has provided satisfactory results in most cases.

iii-Pannus or uveitis syndrome: -

It is a diffuse inflammatory condition affecting the superficial layers of the cornea. It is a primary condition in German Shepherd breed and termed degenerative pannus. Pannus is a subepithelial connective tissue infiltration and vascularization of the cornea.

Causes:

Unknown. Breed predisposition is suggestive.

Symptoms:

It is usually a bilateral condition begins as a grayish haze at the temporal limbus and then starts at the nasal limbus and grows to cover the whole cornea. Superficial vascularization derived from the conjunctiva. The blood vessels are wavy and much branched. Pigmentation continues to spread over the cornea. If the condition is untreated, blindness may result in many cases.

Treatment:



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Pannus is a chronic progressive corneal disorder that cannot be cured. It can be controlled by a variety of medical and surgical means, so that blindness rarely occurs. Treatment must be continued for animal life.

1-Early cases treated by topical application of corticosteroid 4-6 times daily until improvement, then 2-3 times daily. Dexamethasone solution is used 4 times a day then the dose is decreased gradually if response has been observed.

2-In moderately advanced cases subconjunctival corticosteroids are indicated.

3-In advanced cases with minimal scarring Beta radiation is performed.

4-Chemical cauterization with pure carbolic acid (phenol) may be applied to the pannus area.

5-Superficial keratectomy is performed in advanced cases with severe scarring. Antibiotic ophthalmic ointment is applied until re-epithelialization have been completed.

6-Periotomy: The conjunctival blood vessels are destroyed at the limbus at the base of the pannus by heat or electrocauterization.

4- Keratoconjunctivitis sicca: -

It is a diffuse superficial keratitis secondary to lacrimal gland insufficiency.

5-Exuberant granulation tissue

Builds up on the surface of the cornea as a result of injury. Superficial vascularization can be observed crossing the cornea to the area of granulation.

Treatment:

1- Periotomy



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2- Surgical removal of the granulation tissue.

B-Pigmentary keratitis: -

Definition:

It means deposition of pigments in the cornea as a response to an irritating factors or a form of stress. Deposition of pigments may be superficial in the epithelium and superficial stroma or deep at the deeper layers of stroma.

Causes:

- | | |
|--|-------------------------------|
| 1-Trichiasis and distichiasis
palpebral fissure | 2-Exophthalmos and large |
| 3-Entropion and prominent nasal folds | 4-Keratoconjunctivitis sicca |
| 5-Diffuse superficial keratitis (pannus) | 6- Following corneal injuries |
| 7-Anterior synechia (congenital or acquired)
membrane | 8-Persistent pupillary |

Symptoms:

Pigments may be present superficially at the epithelium and superficial layers of stroma or deep at the deeper parts of the stroma. It may be accompanied by opacities of the cornea and vascularization according to the cause.

Treatment:

1-Elimination of the cause, as correction of distichiasis or trichiasis, removal of nasal folds, reduction in the size of palpebral fissure and etc.



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2-Removal of the pigments " If the pigments not interfere with the animal vision, treatment is not indicated, but if the pigments has already resulted in visual impairment, it can be removed by superficial keratectomy.

C-Interstitial or deep keratitis: -

Interstitial keratitis indicates inflammation of stroma, Descemet's membrane and endothelium.

Causes:

1-Extension of bacterial infection from a focus in the animal body such as; diseased tooth, gingivitis tonsillitis, cellulites, or prostatitis

2-Systemic disease such as canine distemper and infectious hepatitis in dogs leptospirosis in horses and pinkeye in cattle.

3-Extension of infection either from superficial layer of the cornea or from the sclera or secondary to anterior uveitis.

4-Traumatic injuries.

5- Neoplasia.

Symptoms:

1-Corneal opacity due to edema and cellular infiltration. The opacity appears as ground glass-like appearance and occupies the entire cornea or may be localized.

2-Deep vascularization of the cornea specially if there is a concurrent iridocyclitis. The blood vessels are usually present at the limbus circumferentially in a form of short vessels parallel to each other and perpendicular to the limbus. They are directed towards the center of the cornea. In later stages they become prominent and progress in a brush-like fashion.

3-Conjunctival and ciliary injection of blood vessels is usually evident.



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4-Hypopyon may be present.

Treatment:

1-Efforts are directed to define the cause and correct it.

2-Topical application of atropine sulphate 1% solution to reduce the chances of anterior synechia and to reduce pain relieving the ciliary spasms.

3-Corticosteroids locally and systematically. Be sure that ulceration of the cornea is absent.

4-Broad spectrum antibiotics locally and systematically especially when bacterial infection is suspected. Select the antibiotic having the power of penetrating the blood-aqueous barrier and intact corneal epithelium to be more effective on the deeper layers of the cornea.

D-Ulcerative keratitis or corneal ulcer: -

Definition:

Corneal ulcer is a lesion in which the epithelium and a variable amount of stroma have been lost. Corneal ulceration usually accompanied by infection and of the cornea and the ulcer is chronic and heals slowly or do not heal.

Causes:

1- Mechanical causes:

a-Abrasions b-Trichiasis, distichiasis and ectopic cilia

c-Foreign body injury

d-Exophthalmos and exposure keratitis

e-Entropion



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f-Tumour of the lid margin

2-Infectious causes:

a-Bacterial-strept., Staph., E.coli, and Moraxella

b-Mycotic

c-Viral (Canine distemper and herpes virus in dog and cat)

d-Chlamydial

3-Metabolic causes:

a-Vitamin A deficiency

b-Senility

c-Keratoconjunctivitis sicca

4-Neurotrophic causes:

Paralysis of the ophthalmic branch of the trigeminal

5-Allergic causes:

Very rare and the ulcer usually present near the limbus.

6-Exposure factors:

Exophthalmos and lagophthalmos.

7-Hereditary causes:

Certain breeds of dogs specially those having prominent eyes has a hereditary predisposition for corneal ulceration.

8-Burns



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Symptoms:

1-Severe pain is manifested by btepharospasm and photophobia with partial or complete closure of the eyelids. Rubbing of the affected eye against objects is evident.

2-Serous, mucopurulent or purulent discharge

3-Loss of transparency of the cornea. Corneal opacity due to edema or cellular infiltration is usually observed around the ulcer or affects the entire cornea.

4-Vascularization of the cornea is the natural response to corneal damage. Superficial and deep vascularization is observed according to the type of the ulcer.

5-The presence of the ulcer its self is diagnostic. The contour of the cornea is changed. Deep ulcer is easily seen but superficial one needs fluorescein dye for staining.

Diagnosis:

1-Clinical symptoms

2-Staining with nonvital stain as fluorescein. Impregnated papers are used or 0.5 - 2% solution. Fluorescein is water-soluble and will not penetrate the intact corneal epithelium. If the epithelium is disrupted, fluorescein will stain the corneal stroma with green color. The strip is moistened with sterile saline and is placed in contact with the superior bulbar conjunctiva. The stain is distributed over the surface of the cornea by closing and opening of the eyelids. The dye is flushed from the corneal surface adequately. The stain will penetrate the stroma and stains it green. Source of light and magnification is used for thorough examination.



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Treatment:

The main object of the treatment is to control infection and hastening the repair process.

1-Elimination of the possible cause

2-Control of infection: In bacterial infection, try broad-spectrum antibiotics as gentamycin, neomycin or polymyxin and bacitracin. Viral infection is treated by idoxuridine drops 0.1% every 1-2 hours or 0.5% ointment 3-4 times daily. Mycotic infection is corrected by pimmaracin. In chlamydial infection use erythromycin and gentamycin.

3- Atropine 1% solution 3-4 times daily to relieve pain

4-Cauterization by using tincture of iodine or phenol for sterilization of the ulcer. It is important to cauterize the ulcer and 1 mm area of surrounding margin.

5-Third eyelid flap and/or conjunctival flap

6-Superficial keratectomy

Sequelae of corneal ulceration:

I-Scar formation:

When corneal stroma is destroyed, regeneration is made by keratocyte and fibroblasts cells. Collagen fibrils produced by these cells are not laid down in a regular manner and do not transmit light. With time scars tend to clear optically. The tendency of clearing is greater in young animals. The deeper the initial injury, the more dense and permanent the scar. Corneal scars are termed nebula, macula, and leucoma according to its size and density.



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Treatment:

In most cases no treatment has been recommended, as the scar not interfere with vision. In large leucomas, corneal graft is the treatment of choice.

2-Descemetocoele (Keratocele):

Definition:

Means protrusion of the Descemet's membrane through the floor of a deep corneal ulcer forming a small transparent vesicle. The membrane is protruded due to the pressure of the aqueous humour and not rupture due to its elasticity. Sometimes the protruded membrane is covered fibrinous exudates and corneal epithelium.

Treatment:

1-The treatment is performed by reposition of the protruded membrane back with an iris spatula or blunt instrument then the wound is sutured by one or two interrupted stitches.

2-When the cause is a deep ulcer, paracentesis of the anterior chamber is required to relieve pressure over membrane. A small needle is introduced at the limbus to reduce the pressure

3-Nictitating membrane flap is placed over the cornea for 10-14 days.

4-Medical therapy consists of topical antibiotic and 1% atropine ointments.

3-Iris prolapse:

Definition:



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Means protrusion of iris through penetrating corneal wound or rupture corneal ulcer. The iris is carried forward into the corneal defect by escaping aqueous humour.

Treatment:

The wound is flushed with boric acid solution and the iris is redeposited into the anterior chamber or amputated if it appears unhealthy. The corneal wound can be sutured after trimming of the edges of the wound. The eyelid flap is applied for 10-14 days, and topical antibiotics and atropine ointments are applied for several successive days.

4-Iris staphyloma:

Definition:

Means protrusion of a part of the iris through the ruptured corneal ulcer and the protruded part is covered with fibrin and layer of epithelium. Adhesion usually present between the protruded part of iris and the edges of corneal wound.

Treatment:

The protruded part of iris is excised and iris spatula is used to free the adhesions between the iris and edges of the ulcer. The wound edges are trimmed with care and then are apposed with simple interrupted sutures. Sterile saline solution and air is injected into the anterior chamber to restore it. A nictitating membrane flap is then performed and topical antibiotic and atropine is applied.

5-Mypopyon:

Definition:



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Means accumulation of inflammatory exudate at the ventral part of the anterior chamber. It usually occurs in cases of severe corneal ulceration with secondary iridocyclitis.

Treatment:

Paracentesis and aspiration of the inflammatory exudates or injection of Alfapsin enzyme intracameral

6-Anterior synechia:

Definition:

Means adhesions between the iris and corneal endothelium (posterior surface of the cornea).

Treatment:

Application of atropine 1% may relieve the condition. Surgery may be recommended to remove the adhesions.

7-Panophthalmitis:

Definition:

Means severe purulent inflammation of the eyeball (pus in the eyeball).

Treatment:

Enucleation of the eyeball

Conjunctival flaps:

Advantages:



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1-An excellent means for supporting the cornea. The conjunctiva provides tissue to fill in strdmal defect. They provide a little more support to the cornea than does a nictitating membrane flap.

2-The conjunctival flap provides a vascularized tissue in intimate contact with the corneal defect.

3-Small and thin conjunctival flaps allow partial vision.

4-Partial conjunctival flap allows observation of the defect and direct application of medication on the cornea. The conjunctival flap should consists of conjunctiva only. It is very elastic, thin and nearly transparent. If the Tenon's capsule is incorporated, it reduces the elasticity of the flap making it more difficult to position. The flap should be transparent enough to permit some vision. Thicker flaps cannot be left permanently as they will interfere with sight. In some severe corneal degeneration the flap may be left permanently. Thin flaps can be dissected after subconjunctival injection of B.S.S. Solution. After transportation, the deep conjunctival surface will adhere to any area where corneal epithelium is missing. It will not adhere to intact surface of the cornea. Most conjunctival flaps have served their purpose and can be removed back in 2 - 3 weeks after transportation.

Bulbar conjunctival flaps are classified into:

1-Partial or Hood bulbar conjunctival flap

It is employed in case of corneal ulcers with stromal loss near the limbus in the following manners

EYELID AFFECTIONS

I-CONGENITAL ANOMALIES: -



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1-Atresia of the eyelid: -

Definition:

It is congenital absence of the eyelid.

Treatment:

Complete reconstruction of the eyelid.

2-Coloboma: -

Definition:

Absence of a segment of the full thickness of the eyelid (notching of the eyelid).

Treatment:

Correction is surgical and is recommended if the defect is associated by corneal or conjunctival diseases or for cosmetic reasons.

3-Dermoids: -

Definition:

Congenital tumour-like masses of tissues. Dermoids may affect the eyelids only or extend to the conjunctiva and /or cornea. Numerous long hairs are present on the surface of the dermoid. Dermoids may be pigmented or non-pigmented, single or multiple, and unilateral or bilateral. The long hairs may result in keratitis and conjunctivitis.

Treatment:

Surgical excision is recommended and eyelid defects may require blepharoplastic reconstruction.



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4-Ankyloblepharon: -

Definition:

It is the fusion of the upper and lower eyelids along the eyelid margin. It is normal in the dog for the first 15 days of life. Delayed opening may lead to infection with staphylococcus resulting in ophthalmia neonatorum.

Treatment:

Hot compresses are applied and the line of fusion is separated by blunt scissors.

5-Macropalpebral fissure: -

Definition:

It is abnormally large palpebral fissure, which exposes the cornea and sclera. This exposure affects the tear film dynamics and predisposes to proptosis.

Treatment:

Lateral or medial permanent tarsorrhaphy is recommended.

6-Micropalpebral fissure: -

Definition:

It is abnormally narrow or small palpebral fissure.

Treatment:

The treatment is not indicated in uncomplicated cases with entropion. Canthoplasty may correct the condition.

II-CONGENITAL OR ACQUIRED AFFECTIONS: -



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1-Tricliiasis: -

Definition:

Trichiasis is a condition in which the cilia arising from normal sites are directed toward the eye and contact the cornea and conjunct. The follicle of the cilia is normally placed, but the direction of growth is toward the eye rather than away. Trichiasis is common in dogs specially Cocker Spaniels and Poodles, but rare in other domestic animals. Trichiasis is congenital but may be acquired following injury to the eyelid. Also it may occur with prominent nasal folds especially in Pekingese and Pugs, entropion, dermoids and blepharospasm.

Symptoms:

1-Presence of abnormally directed cilia towards the eyeball.

2-Blepharospasm

Pain associated with constant irritation of the cornea and conjunctiva resulting in blepharospasm and rubbing of the eye.

3-Epiphora

Excess tearing and staining of the facial hairs is present. The lacrimal puncta and nasolacrimal duct should be flushed to eliminate blockage as a cause. Epiphora is often present from early age, and this help to differentiate cilia disorders from other conditions causing epiphora.

4-Chronic conjunctival erythema

The conjunctival blood vessels are engorged with blood.

5-Corneal ulceration



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Ulcers caused by cilia are usually shallow and eccentrically placed on the cornea corresponding to the position of cilia.

Treatment:

1-Forceps epilation

If the cilia are few in number, they may be pulled. A special cilia forceps works best for such cases. The process is repeated every few weeks, since the lashes grow back.

2- Electroepilation by using a butterfly electrolysis

Low current 2-3 milliamperes is used. Excessive current will result in scarring of the eyelid. Insert the needle along the root of the lash and keep it there until the lash is free or cling to the needle and be extracted during its withdrawal.

3-Operation for entropion

Removal of nasal fold when the hair at the nasal fold irritate the cornea and conjunctiva.

4-Surgical removal of dermoids when the hair over it irritate the eyeball.

2-Distichiasis: -

Definition:

Presence of a second abnormal row of eyelashes. The cilia originate from abnormally located follicles, which emerge from or just posterior to the openings of the meibomian glands. The condition is congenital and probably inherited in dogs. All breeds are affected, but it most commonly occurs in Cocker Spaniel, Pekingese and Poodles. Distichiasis can be observed in animals of all ages,



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indicating that the ingrown lash may be present for years before it penetrates the conjunctiva. Distichiasis are rarely seen in other domestic animals.

Symptoms:

1- Blepharospasm.

2- Conjunctivitis.

3- Keratitis and corneal ulceration.

4- Presence of abnormal cilia. Distichia are usually multiple (from 5-40 cilia) and difficult to see as they are thin and lightly pigmented. Magnification and source of illumination with eversion of the lid margin facilitate detection of distichia. Sometimes multiple eyelashes can be seen emerging from a single follicle (distichiasis).

Treatment:

1-Epilation by cilia forceps

It can be performed under topical anesthesia. The lashes will grow back within several weeks.

2- Electroepilation

Electrolysis destroys the follicle permanently. The procedure is performed under magnification and illumination. It is tedious if cilia are numerous. The needle is introduced 2-3 mm along the cilia for 5-30 seconds. Low current minimizes tissue destruction and prevents twitching of orbicularis oculi muscle. Commercial battery powered epilation units are available.

3-Lid-splitting operation



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Resection of the cilia-bearing conjunctiva provides more satisfactory results than electroepilation. The number and position of distichia determine the extent and location of surgical sites.

The lid is held with fixation forceps or chalazion clamp. The lid is split at the level of the meibomian gland orifices into 2 layers; tarso-conjunctival and orbicularis-skin. The depth of scalpel or razor blade is about 2 mm. This is enough to reach the tarsus and include the distichia. The base of cilia-bearing strip of tarso- conjunctiva is excised by small scissors. Haemorrhage is controlled with topical epinephrine 1:10.000 solution. No sutures are required and healing by granulation is complete by two weeks. Topical antibiotic-corticosteroids for 5-7 days are administered.

4-Removal of a V- shaped segment of the tarso-conjunctiva containing distichia

The resultant defect may then be filled with sliding graft of tarso-conjunctival or left to granulate.

5-Various entropion surgical techniques may be used to treat distichiasis

It can be performed by everting the eyelid margin, thereby redirecting the distichia away from the eyeball.

3-Ectopic cilia: -

Definition:

Ectopic cilia means single or multiple cilia are emerging from the conjunctival surface of the eyelid. The condition is congenital and observed after several months to several years of age. It is evident that while aberrant follicles may be present at birth, the problem is not clear until the cilia grow and penetrate the conjunctival surface



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Symptoms:

- 1-Presence of ectopic cilia at the palpebral conjunctiva, 2-6 mm from the lid margin
- 2-Ectopic cilia usually develop from an elevated area of the palpebral conjunctiva, which may be hypopigmented or hyperpigmented.
- 3-Blepharospasm and epiphora.
- 4-Conjunctivitis especially at the bulbar conjunctiva
- 5-Vascularization of adjacent parts of the cornea accompanied by an elongated superficial corneal ulcer

Treatment:

- 1-Electroepilation of ectopic cilia
- 2-Surgical removal of the cilia with part of tarso-conjunctiva containing the follicle

4-Chalazion - Meibomian cyst - Tarsal cyst: -

Definition:

It is an enlargement of the meibomian gland caused by blockage of its duct

Symptoms:

- 1-Localized *painless* swelling and yellow-white in color when viewed through the palpebral conjunctiva
- 2-The size of the swelling varies between a pea-like swelling in dogs to a hazelnut in horses



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- 3-Chalazion is few millimeters from the lid margin
- 4-Chalazion bulges the skin over it but still the skin is freely movable
- 5-The conjunctiva over the chalazion is reddened and elevated
- 6-The contents are usually cheesy inspissated oily secretion

Treatment:

- Chalazion clamp is applied to the eyelid and then everted
- Incision is made through the conjunctiva over the swelling
- The contents are squeezed and the wall of the chalazion is thoroughly curetted.
- The clamp is removed and antibiotic ointment is applied for several days.

5-Hordeotum - Stye: -

Definition:

Hordeum is an acute localized suppurative inflammation of the glands of Zies and glands of Moll belonging to the follicle of the eyelashes. Hordeolum affecting glands of Zies and Moll usually termed external hordeolum, while that affecting meibomian gland (meibomitis) is termed as internal hordeolum. The microorganism is usually staphylococcus.

Symptoms:

- 1- Small solitary abscess or multiple abscesses at the lid margin
- 2- Blepharitis, blepharospasm and epiphora
- 3- The condition is painful



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4- Internal hordeolum is characterized by presence of small painful abscess at the inner surface of the eyelid near the lid margin

Treatment:

- Pulling of the offending eyelash (epilation) which present at the apex of the swelling.
- Softening of the skin over the abscess by hot compresses contains sodium bicarbonate.
- Incision of the abscess and evacuation of its content
- Rubbing of antibiotic ointment to the lid margin
- Systemic antibiotic may be indicated
- If there are recurrences, injection of staphylococcus toxoid is of value

6-Entropion: -

Definition:

Entropion means turning-in or inversion of the eyelid margin.

Causes:

Entropion can be classified by etiology into two groups:

A-Congenital entropion: -

It occurs most frequently in dogs, horses and sheep. Congenital entropion may occur sporadically or may be inherited as an autosomal dominant trait in some breeds of dogs. Different anatomic components of entropion are characteristic for each breed of dogs. As example, lateral canthal entropion is common in large and



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giant breeds of dogs (St. Bernard and New Foundland), entropion at the lateral two-thirds of the lower eyelid is common in Bulldog and medial lower lid entropion is exhibited in the Toy and Miniature Poodle. Also entropion may be accompanied with micro-palpebral fissure in the Chow Chow, with distichiasis in St. Bernard and Cocker Spaniel and with enophthalmia in Doberman and Great Dane.

B-Acquired entropion: -

i-Spastic entropion: -

Chronic irritation of the conjunctiva (Follicular conjunctivitis) initiates the spasm of orbicularis oculi muscle. Continuous blepharospasm tends to accentuate lid margin inversion; the resulting trichiasis increases irritation and a cycle of increases irritation and increasing severity of blepharospasm occurs with end result of spastic entropion.

Treatment:

Auriculopalpebral nerve block will relieve and define the blepharospastic component of entropion.

ii-Cicatrical entropion: -

It occurs due to fibrosis and contraction associated with surgery or trauma of the conjunctiva. Also chronic inflammatory process of the conjunctiva can produce cicatrical entropion

iii-Bulbar entropion: -

Usually resulting from enophthalmos, microphthalmos, atrophy of the globe and enucleation of the eyeball

Symptoms:



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- 1-Epiphora, photophobia, and blepharospasm
- 2-Conjunctivitis with purulent discharge in chronic cases
- 3-Corneal ulceration and vascularization
- 4-Inversion of the lid margin with trichiasis

Treatment:

Entropion is generally a surgical problem, the technique of correction is determined by the cause, location, and extent of entropion.

A-Mild cases in young animals: -

It may be managed medically until maturity for complete facial development and to avoid risk of anesthesia. Different techniques for correction of entropion have been reported:

1-Suture technique: -

The edge of the eyelid is retracted with 3-4 vertical mattress sutures that are left in place for 7-10 days. This is the treatment of choice in foals.

2-Injection technique: -

Various materials are injected into the lower lid to tense it and cause eversion. Procaine penicillin, melted paraffin wax, or even sterile air (5-15 ml) is effective in many cases, (injection of air from the sheep yard may lead to infection, with spores of clostridium tetani). This technique is used mainly in lambs.

3-Stapling technique: -

Stapling of an elliptical segment of skin with paper stapler can be used in lambs.



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4-Cautery puncture: -

It is effective in mild cases in dogs. The skin of the eyelid is penetrated with a blunt pointed electrode or well-heated strabismus hook. These punctures in one or two rows are 4-5 mm from the lid margin and extend through the tissues and not through the palpebral conjunctiva. The resultant cicatrization ended with correction.

B-Surgical treatment of severe cases or in mature animals: -

1-Elliptical skin resection technique: -

The initial skin incision is made parallel to and 2-3 mm from the lid margin (in dogs) to a depth that includes the orbicularis oculi muscle. The length of incision is determined by the length of inverted eyelid margin. The second elliptical incision is performed below the first one and join it at both ends. The width of skin flap will depend on the amount of entropion. The incised area of skin is elevated and excised by scalpel or scissors. Haemorrhage is controlled with digital pressure or with topical application of epinephrine 1/10.000- 1/100.000. Suture the wound with 4/0 nonabsorbable simple interrupted sutures. The sutures are removed 10-14 days after surgery.

2-Trephine technique: -

A local area of skin is removed with a dermal punch, resulting in a defect that is circular, then sutured horizontally. This technique is effective in cases of entropion affecting small area of the lid or in cases of entropion affecting both the upper and lower eyelid at the lateral canthus.

3-Pinch technique: -

Pair of curved Mosquito forceps is placed on a fold of skin 2-3 mm from the lid margin and parallel to it. The amount of skin depends on the degree of entropion



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and can be estimated before application of forceps by using toothed tissue forceps. The haemostats are closed and the skin is crushed between the jaws and then the haemostats are removed. The strip of skin is grasped and excised by scissors. The wound is carefully sutured with simple interrupted sutures of 4/0 silk. The sutures are removed after 14 days. The pinch technique can be considered the technique of choice for correction of entropion in dogs and cats and can be adopted in mild and severe cases. The resected areas should correspond in location and extent to the affected portion of lid.

4-Lateral canthoplasty: -

In some breeds of dogs namely Chow Chow, English Bulldog, Golden Retriever and St. Bernard, there is a combination of ectropion at the central portion of the lower eyelid and entropion at the medial and lateral portions of the eyelid. This condition is accompanied by a round lateral palpebral fissure. This problem is due to poorly functional lateral retractor muscle and weak lateral canthal ligament. A Y-shaped incision is made at the lateral canthus and the arms of the Y extend superiorly and inferiorly over the upper and lower eyelids. The skin surrounding the Y is undermined and the orbicularis oculi muscle is exposed. A superior and inferior strips of orbicularis oculi muscle are dissected free with their base attached at the lateral canthus. The two strips are united with single suture of 2-0 silk in a figure-of-eight pattern, then grasped and anchored firmly to the periostium of the zygomatic arch at a location that restores normal confirmation of the palpebral fissure. A modification for fixation of the suture material to the strips of orbicularis muscle is suggested by using double needles thread. One needle traverse the upper strip from its base to the apex and the second needle traverse the lower strip also from the common base to the apex. The two needles with the thread are grasped laterally to the periosteum of the zygomatic arch. The skin incision is routinely closed.

7-Ectropion: -



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Defenition:

Ectropion is an eversion, out rolling, or turning out of the eyelid margin. The lower eyelid is most commonly involved. It is common in dogs and rare in cats and other domestic animals.

Ectropion is classified according to the cause into:

A-Congenital ectropion: -

This type is usually breed associated in dogs with loose face skin e.g., Saint Bernard, Bloodhound and Cocker Spaniel.

B-Acquired ectropion: -

i-Senile ectropion: -

It ensues due to decreased tone of orbicularis oculi muscle. It is atonic variety characterized by elongation of the lower lid, lack of good muscle tone, eversion and drooping of the lower eyelid.

ii-Cicatrical ectropion: -

It ensues due to retraction of the lower eyelid by contraction of scar tissue secondary to surgery, trauma, thermal and chemical injuries or chronic inflammation.

iii-Intermittent ectropion: -

It can be seen in some hunting dogs that develop physiological ectropion due to fatigue of facial muscles. These dogs look normal at morning and have ectropion by evening.

Symptoms:



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1-Eversion of the eyelid, abnormally exposes the palpebral and bulbar conjunctiva and cornea. This may results in conjunctiva! and/or corneal disease.

2-The degree of ectropion varies markedly from just slight ectropion of the medial or middle part of the lower eyelid to complete ectropion of the entire lower eyelid.

3-Marked ectropion may leads to marked epiphora, keratinization, hypertrophy of the conjunctiva, and exposure keratitis due to faulty eyelid closure.

Treatment:

Ectropion should be corrected surgically when it results in secondary conjunctival or cornea! disease e.g. conjunctivitis, corneal vascularization or pigmentation and exfoliative blepharitis due to epiphora. Cicatrical ectropion usually results in unsightly cosmetic defects, which justify correction even without presence of ocular lesions. Many techniques have been used to correct different types of ectropion.

1-Cautery puncture:

Small areas of. electrocautery are performed on the conjunctival side of the everted eyelid to create an area of scar tissue with resultant contraction of the eyelid. The electrocautery or heated muscle hook is thrust through the palpebral conjunctiva in. a parallel line about 4-5 mm from the lid margin. The technique has proved very unreliable as the degree of contraction and scaring is impossible to estimate.

2-Conjunctival excision:

It is the removal of a small horizontal piece of conjunctiva at the level of the area of ectropion. It may be done alone or in combination with oilier procedures. The conjunctiva is grasped with tine forceps, elevated, and clamped with mosquito



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artery forceps for one minute. Then the caimp is removed and the elevated ridge of tissue is excised with tenotomy scissors. The conjunctiva is closed with simple continuous suture. Again, the technique has not proved reliable especially in cases of marked eyelid laxity.

3- Skin trephination:

It is used for mild ectropion, especially when only a portion of the lid margin is affected. Several small circles of skin (2-4) are removed with skin biopsy punch (5-7 mm diameter), 3-5 mm from the lid margin. The edges are sutured in a vertical manner using 4/0-6/0 with eyeless needle in simple interrupted pattern.

4-Kuhnt-Helmbold technique:

This technique is effective in case of moderate congenital or 'senile ectropion when the lower eyelid is too much elongated.

- The eyelid is split into skin-orbicularis and tarso-conjunctival layers
- A V-shaped tarsoconjunctival wedge is removed medially
- A similar V-shaped wedge of skin and orbicularis oculi muscle excised, 5-10 mm lateral to the level of the tarsoconjunctival one
- The two V-shaped wounds are closed independently with simple interrupted stitches
- Additional sutures of fine absorbable suture materials are used at the lid margin to re-appose the skin-orbicularis muscle and tarso-conjunctival layers

5-Kuhnt-Szymanowski technique:

- This technique is used in advanced cases of congenital and senile ectropion when more pronounced elongation of the eyelid is present.



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-The lateral one-half of the lower eyelid is split into skin-orbicularis oculi muscle and tarso-conjunctival layers to a depth of 20 mm.

-A wedge shape of the tarso-conjunctival layer is excised. The skin incision is continued laterally, following the natural curve of the lower eyelid, for one cm. from the lateral canthus.

-The skin-orbicularis muscle flap is separated by blunt dissection to provide a lateral movement of the flap

-A wedge of the sliding skin-muscle flap is excised at its lateral margin

-The tarso-conjunctival and skin-orbicularis muscle wounds are sutured and the edges of the lid margin are apposed as mentioned before.

6-Full thickness eyelid resection at the lateral canthus:

-This method is suitable for congenital and senile ectropion with moderate elongation of the lower eyelid. It is essentially a full thickness resection of the eyelid similar to that used for tumour removal.

-The edge of the eyelid is notched 3-4 mm from the lateral canthus with mosquito artery forceps. The actual lateral canthus is avoided because the eyelid is much thicker at the canthus than it is where the tarsal glands are present.

-The excess length is estimated and the eyelid is notched again by another Mosquito artery forceps to determine the length of the part of eyelid to be resected.

-A scissors are used to cut the eyelid at the notch near the lateral canthus for about one cm. The cut edge is grasped until the eyelid is tense.

-The overlapping portion of eyelid estimated before, is removed by a scissors in a form of a V-shaped flap



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-The V-shaped wound is closed; the tarso-conjunctival layer then the skin-orbicularis oculi layer as the same manner of eyelid laceration.

7-Full thickness resection at the middle of the eyelid:

-This technique is used when ectropion is accompanied by scarring or deformity at the central area of the lid margin.

-Stretching of the eyelid from the lateral canthus will not correct the lesion and therefore a central technique must be used.

-The technique is basically the same as described for full resection at the lateral canthus. In some cases the palpebral conjunctiva is left intact and the eyelid is incised to the level of meibomian gland, then complete triangle of the skin is removed.

8-V-Y blepharoplasty (Wharton-Jones blepharoplasty):

-This technique is used basically to correct cicatricial ectropion. Most cases of cicatricial ectropion are associated with scar formation from bite wound or other forms of trauma. The cicatricial ectropion is differs from senile and congenital types is that instead of too much tissue being present in the later, there is loss of tissue in cicatricial one. The aim of surgical procedure is to free the skin from the underlying scar and allow the lid to return back to its normal position.

-A V-shape skin incision is made including the scar

-The skin flap-is freed from the underlying scar tissue by blunt scissors dissection and the scar tissue is excised. The skin flap is moved upward to correct the eyelid margin.

-Undermine the skin at the apex of the "V".



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-Close the defect in a "Y" shaped pattern to cover the bared are of skin with simple interrupted suture. |

Complication of ectropion surgery:

1-Undercorrection have been most prevalent when a lid shortening procedure without lid elevation is used and sagging of the lower eyelid continues.

2-Overcorrection can result if too much eyelid tissue is removed with resultant entropion development.

3- Excessive shortening of the palpebral fissure may result when to much full thickness wedge resection is removed.

8-Blepharitis: -

Definition:

Blepharitis is a general term describing inflammation of the eyelids.

Classification:

1-According to the cause blepharitis is classified into, bacterial, mycotic, parasitis, allergic, traumatic and neoplastic.

2-From the pathological point of view, blepharitis is classified into *superficial* which results from dermatitis, conjunctivitis, hordeolum, chalazion or irritation by mange and *deep* blepharitis which results from a bite or deep lacerating wound.

3-Clinically, acute, subacute or chronic; and granulomatous or nongranulmatous blepharitis can be differentiated.



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4-Blepharitis may be focal or diffuse, unilateral or bilateral and may involve the upper and/or the lower eyelids.

Symptoms:

1-Pain manifested by blepharospasm.

2-Hyperaemia and swelling of the eyelid due to edema or inflammatory cell infiltration.

3-Alopecia, Scalpess, pruritis, and epiphora

4-Serous or purulent exudation

5-Ulceration and fibrosis specially in chronic cases

Treatment:

1-Careful cleaning of the lid margins and removal of purulent exudates with cotton soaked with worm normal saline or 2% sodium bicarbonate solution.

2-Topical application of antibiotic ointments to the outer and inner lid margin

3-Systemic antibiotics can be described in acute cases

4- Topical fungicide is, used in cases of fungal blepharitis

5- In parasitic blepharitis a protective ointment is applied to the lid

6- Corticosteroids and antihistamines are indicated in cases of allergic blepharitis.

9-Ptosis or Blepharoptosis: -

Definition:



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Means drooping of the upper eyelid. Ptosis is classified according to the cause into:

A-Congenital ptosis:

As in cases of enophthalmia or atrophy of the globe

B- Acquired ptosis:

i-False ptosis:

As a result of trauma of the eyelid, abscess or tumor of the eyelid; or fracture of the supraorbital process

ii-True ptosis:

It may be central as a result of cerebral or cerebellar tumor or peripheral due to paralysis of the nerve supply of the levators of the eyelid. Oculomotor nerve supply the inner levator of the upper eyelid (levator palpebrae superioris) and the facial nerve supply the outer levator of the upper eyelid (corrigator supercilii).

Treatment:

- 1- Resection of the levator muscles of the upper eyelid.
- 2- Removal of an elliptical piece of skin or trephination of a circular disc and suturing the wound horizontally.

10-Traumatic eyelid injuries: -

Most traumatic injuries of the eyelids are mechanical in origin. In large animals; nails, hooks and barbed wire are responsible for eyelid wounds and lacerations. In small animals, injuries mainly are due to animal bites or cat scratches. Injuries



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are classified clinically into those that involve the skin only and those involve the full thickness of the eyelid. The tear is parallel or perpendicular to the lid margin. Considerable haemorrhage is observed with epiphora and blepharospasm. The eyelids are highly vascular structures and have a remarkable ability for healing and resistance to infection. Nearly complete avulsed eyelid can be successfully repaired simply by suturing it back into proper position directly after injury.

Treatment:

1-Copious irrigation and cleaning of the wound with boric acid solution 2% or warm normal saline.

2-Removal of any blood coagulum or foreign body

3- Minimal debridement of the wound

4-Suturing of the wound to restore the anatomic and functional integrity of the eyelid. In full thickness injury two-layers closure is the technique of choice. Tarso-conjunctival with absorbable suture material and orbicularis-skin with non-absorbable suture material. The lacrimal punctum and canaliculus should be identified and preserved as much as possible.

5-Protective neck collar is applied and taping of dew claws

Complications:

1-Epiphora due to distortion of the puncta lacrimalis

2-Entropion or ectropion

These complications can be corrected latter on as a secondary procedure following complete healing of primary wound.

11-Eyelid tumours: -



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Eyelid neoplasms are not uncommon in domestic animals specially in dogs. The most common eyelid tumours are:

Dog: -Adenoma, papilloma, melanoma and adenocarcinoma.

Cat: - Squamous cell carcinoma and fibrosarcoma (Sarcoids).

Cattle: - Squamous cell carcinoma.

Treatment:

All eyelid tumours are regarded as malignant until proved otherwise by biopsy examination. The best treatment is combination therapy of two or more of the following methods:

1-Surgical excision:

The tumour tissue should be removed as much as possible, including the regional lymph node if affected. Complete surgical excision is not possible in extensively invading neoplasms as squamous cell carcinoma and additional methods are used to destroy remaining cells.

Small tumours involving one-third or less of the lid margin, a full-thickness V-shaped excision technique is indicated.

2- Cryotherapy:

The lesion and surrounding margin of normal tissue are frozen. The result is death of the cells, necrosis, sloughing and healing by granulation. The temperature of the probe is -25°C and double freeze-thaw cycle is used. Thawing should be up to 20°C. Freezing can be performed by cold probe or by liquid nitrogen. The surrounding structures must be isolated by a surgical sponges impregnated with petroleum jelly. Freezing of tumours increase the antigenicity of the tumour cells and result in increase immunologic response to the tumour.



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3- Radiation therapy : The most sensitive tumour to radiation therapy is the squamous cell carcinoma. Gamma radiation is used frequently and may be administered by radon seeds, cesium implants or X-ray therapy machine. Beta radiation is also used and is emitted from strontium 90 ophthalmic applicator. A dose of 4000 to 5000 rads for 7-10 days is suitable for most tumours.

4-Chemotherapy:

Chemotherapeutic agents are not commonly used for treatment of eyelid tumours, these are alkylating agents, antimetabolites, antibiotics, corticosteroids and enzymes. Such agents are used to reduce the size of tumour before radiation therapy or surgical excision.

5-Immunotherapy:

Different agents have been used to stimulate the immune system of the animal body against neoplastic cells. These are nonspecific immune stimulants injected intramuscularly to stimulate the entire immune system such as tetramizole, live or killed BCG extracts (for equine sarcoid), Brucella abortus vaccine and specific immune stimulants injected into tumour masses such as BCG and corynebacterium parvum.

12- Eyelid abscesses: -

In most cases eyelid abscesses are subconjunctival and in some cases subcutaneous. The cause may be penetrating wound, embedded foreign body or hordeolum. Subconjunctival abscesses are present at the lateral canthus, upper eyelid and lower eyelid. The conjunctival abscess swelling extends over the eyeball and protrudes through the palpebral fissure preventing closure of the eyelids. Subcutaneous lid abscess leads to swelling of the eyelid preventing opening of the eyeball.

Treatment:



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In subconjunctival abscess, evacuation is performed through a conjunctival incision. After squeezing and flushing of the abscess cavity, antibiotic eye ointment is applied. Subcutaneous lid abscess is drained through a skin incision.

GLAUCOMA

Definition:

It is an increase of intraocular pressure (IOP). It is one of the most frequent causes of blindness. The elevated IOP eventually involves all tissues of the eye.

Types:

- 1-Primary glaucoma-No overt cause (absence of concurrent ocular disease).
- 2-Secondary glaucoma -Due to iridocyclitis, intraocular neoplasms, and luxated lens.
- 3-Congenital glaucoma-Congenital malformation at the anterior chamber angle. Anterior segment anomaly usually present at birth (gonio-dysgenesis)

Effect of elevated IOP on the tissues of the eye:

Glaucoma may be due to impairment of the outflow of aqueous humour from the anterior chamber angle. The exit of this fluid occurs through the trabecular meshwork at the anterior chamber and uveoscleral outflow to the suprachoroid space. The effect of elevated IOP varies with the age of the animal, duration, and levels of IOP. In young animals, elevated IOP rapidly leads to buphthalmia (enlargement of the globe).

- 1-Cornea: -



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With acute elevation of IOOP, the cornea becomes edematous. Vascularization and pigmentation resulted with buphthalmia (megaloglobus). The cornea may enlarge (megalocone). At later stages, rupture of Descemet's membrane may occur, and ulceration and perforation may result. Corneal edema in acute glaucoma disappears within hours if IOP has been normalized.

2-Sclera: -

Buphthalmia and elevated IOP result in enlargement of the sclera. It -becomes thin and atrophied. At the scleral canals (emissaria-seat of entrance of blood vessels and nerves), staphylomas will occur. Cupping of optic nerve with its atrophy occurs later on.

3-Iris: -

It undergoes progressive atrophy, and iris stroma becomes thin, and pigments become dispersed into the anterior chamber. The pupil becomes enlarged and less responsive to cholinergic miotics.

4-Ciliary Body: -

The ciliary body becomes progressively atrophied, and aqueous humour formation becomes impaired with resultant hypotony

5-Anterior Chamber: -

It exhibits closure, and extensive numbers of peripheral anterior synechiae resulted.

6-Choroid: -

Thinning and atrophy

7-Lens: -



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It exhibits changes in morphology and position. Cataract with displacement is usually evident

8-Vitreous humour: -

Undergoes degeneration with formation of distinct strands and extensive liquefaction (syneresis).

9-Retina and optic disc: -

Loss of retinal ganglion cells and thinning of nerve fiber layer, cupping of the optic disc with loss of myelin, loss of vasculature, and atrophy of the disc.

Methods of Diagnosis:

1-Tonometry:

It is the estimation of the IOP

2-Gonioscopy:

It is a diagnostic procedure to examine the angle of the anterior chamber. Direct goniolescopes and indirect gonioscopes are useful for examinations. Open anterior chamber angles in glaucomatous eyes usually respond to medical treatment, while narrow or closed angles are usually candidates for antiglaucoma surgical procedures

3-Tonography:

Is a tonometry for an extended period of time, usually 4 minutes. This is to estimate the coefficient of aqueous humour outflow

4-Ophthalmoscopy:

It is essential for evaluation of the condition of the fundus and optic disc.



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Treatment: 1-Medical Treatment: -

The purpose of this treatment is the maintenance of IOP within the range of normality.

a-Miotics as 1 to 2% pilocarpine.

b-Adrenergics to reduce IOP by stimulating the alpha and beta receptors. The alpha receptors increase the outflow of aqueous, and beta receptors decrease the aqueous production (1 to 2% epinephrine).

c-Osmotic diuretics as mannitol, intravenously, 1-2 gram/Kg and glycerol orally, .1-2 ml/Kg.

d-Carbonic anhydrase inhibitors are useful (acetazolamide oral 10 to 25 mg/Kg). These drugs reduce active aqueous humour formation by inhibiting enzymatic processes within the ciliary body.

2-Surgical treatment: -

a-Iridencleisis: -

A radical section of the iris is permanently positioned through a limbal incision into the subconjunctival space beneath the bulbar conjunctiva.

Technique:

-Limbal-based conjunctival flap.

-Limbal incision.

-Pupillary border of iris grasped and retracted into the limbal incision.

-Iris torn into 2 separate iridal pillars.



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-Iridal pillars are secured at the ends of limbal wound.

-The conjunctival flap is opposed.

b-Cyclodialysis: -

It is an artificial fistula between the anterior chamber and subconjunctival space through the sclera.

Technique:

-Fornix-based conjunctival flap

-Excision of a full thickness block of the sclera 4 to 5 mm from the limbus

-Cyclodialysis spatula is introduced through the subscleral space to the anterior chamber

-The conjunctival flap is opposed.

c-Iridectomy: -

It is the removal of a complete section of the iris.

Technique:

-Limbal-based conjunctival flap

-Limbal incision

-Iris grasped through the incision

-A section of iris is excised

-Conjunctival flap is opposed (pupil appears like keyhole).



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d-Iridencleisis and Cyclodialysis: -

e-Corneoscleral trephination: -

f-External fistulation under scleral flap: -

g-Removal of subluxated lens for treatment of glaucoma: -

LACRIMAL SYSTEM AFFECTIONS

I-ATRESIA OF THE LACRIMAL PUNCTA OR IMPERFORATE PUNCTA: -

Definition:

It is a congenital anomaly in which the upper and/or the lower puncta is absent. The condition may be unilateral or bilateral. As the absence of the upper punctum usually present without any clinical signs, absence of the lower punctum is most commonly observed.

Symptom:

Epiphora (abnormal flow of tears over the face) and excessive moisture of the medial canthal skin. In most cases the obstruction consists of a thin layer of conjunctiva over the lumen.

Differential diagnosis from:

1-Simple obstruction of the punctum by inflammatory products

2-Absence of punctum and canaliculus



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3-Displacement of the punctum

4-Dacryocystitis.

Treatment:

Surgical opening of the affected punctum. A lacrimal cannula is inserted into the patent punctum or at the nasal punctum and flushing is performed under pressure. The thin membrane is balloons under pressure and can be identified and excised by a scissors leaving an oval or round defect. Also a cruciate incision may be performed in this area. Insertion of a nasolacrimal catheter is recommended for 2-3 weeks until healing takes place. Topical antibiotic-corticosteroid solutions are instilled 6-8 times daily for 10 days to maintain patency.

II-DISPLACEMENT OF THE LOWER PUNCTUM: -

Definition:

The lower punctum is displaced few millimeters ventral to its normal position.

Causes:

1-Primary as a congenital anomaly

2-Secondary to entropion, trauma, or scarring. Senile ectropion usually results in displacement of the lower punctum outwards.

Symptoms:

1-Continuous epiphora (with closure of the punctum by exudates) and the hair at the medial canthal skin is usually moist.

2-The ventral conjunctival cul-de-sac may be hyperaemic.

Diagnosis:



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1-Signs

2-Fluorescein passage from the eye is delayed or absent.

3-The nasolacrimal flush usually indicates patency.

4-Examination by surgical microscope confirm ventral displacement of the lower punctum.

Treatment:

It is only indicated in severe cases. The displaced lower punctum may be relocated to their normal position or a new exit for tear drainage is constructed (conjunctivorhinostomy or conjunctivoralostomy).

III-OBSTRUCTION OF THE CANALICULI: -

Obstruction of the canaliculi is observed at the lower canaliculus as the obstruction of the upper one not associated by epiphora, thereby escaping detection.

Causes:

1-Congenital absence of the canaliculus is related to the absence of the punctum.

2-Obstruction of the lower punctum is associated with inflammatory debris and foreign materials (sand or planet owns).

Diagnosis:

Nasolacrimal flushing reveals no passage in cases of congenital absence of the canaliculus and punctum.



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Treatment:

1-In cases of foreign body obstruction, the inflammatory debris or foreign body will be expelled during flushing.

2-Conjunctivorhinostomy or conjunctivorhinostomy is the operations of choice in cases of absence of the lower canaliculus.

IV-CANALICULUS LACERATIONS: -

Most lacerations involve the lateral aspect of the palpebral fissure but sometimes affect the medial part of the lower eyelid.

Symptoms:

1-The eyelid is usually edematous

2-Debris and hemorrhage may obscure the extent of injury so the area of laceration must be examined carefully with a magnification

Treatment:

1-The punctum is cannulated during the process of suturing of the wound

2-Topical antibiotic-corticosteroid is applied

V-DACRYOCYSTITIS: -

Definition:

It is inflammation of the nasolacrimal sac. Dacryocystitis usually is a concurrent with or sequelae to conjunctivitis. The accumulation of cellular debris and other foreign bodies within the lacrimal sac provides a good medium for bacterial proliferation. The resultant inflammation of the mucous membrane constricts the lumen or even close it.



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Symptoms:

- 1-The condition may be acute or chronic
- 2-Thick mucoid or mucopurulent discharge is present at the medial canthus.
- 3-Mucopurulent conjunctivitis is usually present.
- 4-Small swelling at the medial canthus is evident and painful to palpation. Digital pressure over this swelling may extrude mucopurulent exudates.
- 5-In acute dacryocystitis, abscess may be formed and opens subcutaneous at the medial canthus and a fistula may develop connecting the sac with external skin.

Treatment:

- 1-Medical treatment is directed towards combating infection and re-establishing the patency of the duct. Irrigation is applied first by antiseptic solution then a broad-spectrum antibiotic and corticosteroid are added to the ophthalmic lotion.
- 2-Surgical treatment consists of catheterization and placement retention tubing at the lower canaliculus. The tube is left in place for 2-3 weeks. Flush the lower punctum daily until discharge stops. Medicate the eye 3-4 times daily by ophthalmic ointment until the tube is removed. The catheter or polyethylene tube can be sutured in place at the face.

N.B.:

Dacryocystitis occurs in donkeys due to infection by *Histoplasma* species. The disease is very common in some localities in Egypt and is usually observed unilaterally but the other eye get the infection after sometime from the first one. The medial part of the lower eyelid at the medial canthus of the eyeball becomes swollen and the conjunctiva gets inflamed. The lower punctum is dilated and transformed into rounded aperture. The lower eyelid is turned out at the medial



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canthus. A granulomatous tissues start to protrude through the puncta lacrimalis. In later stages a huge granulomatous tissue mass protrudes completely through the lower punctum and extends toward the cornea. These tissues are fleshy, rosy red in color, friable and easily detachable with moderate bleeding. Severe epiphora and blepharospasm are detected. Mucopurulent discharge may be observed in some cases. Long standing dacryocystitis may be complicated by maxillary sinusitis and purulent discharge is extruded from the nostril of the affected side.

The treatment is mainly surgical. The lacrimal sac is squeezed by digital pressure in early cases and retrograde flushing is performed. In advanced cases the granulomatous tissues are excised with a blunt scissors. The lacrimal sac is opened through the medial canthus, the content is evacuated and the lumen is curetted. Flushing is performed several times daily for 10 successive days with antibiotics and fungicidal solutions. Recovery is usually obtained but recurrences have been recorded in many cases.

VI-OBSTRUCTION OF THE NASOLACRIMAL DUCT: -

Congenital atresia of the nasolacrimal duct has been reported. Acquired obstruction is simply related to inflammatory debris or foreign materials in the lumen of the duct. It may be due to inflammation of the wall of the duct resulted in stenosis or complete obstruction. Also pressure of a tumour or abscess from outside may obliterate the lumen of the duct.

Signs of obstruction:

1-Epiphora, moisture and tear staining of the medial canthus

2-Serous or seromucoid conjunctivitis •

Treatment:



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1-In congenital atresia of a segment of the duct, conjunctivoralostomy or conjunctivorhinostomy is the treatment of choice

2-In cases of acquired obstruction flushing of the duct is performed 2-3 times daily for several days with ophthalmic solutions containing antibiotics and corticosteroid.

VII-ATRESIA OF NASAL PUNCTUM: -

It means absence of the nasal punctum at the nostrils. The lumen of the duct is distended with saline via the lacrimal puncta and the mucosa at the nostrils is dissected until the lumen is entered. Lacrimal cannula is inserted for several days until the opening have been established.

VIII-EPIPHORA: -

Definition:

It means abnormal flow of tears outside the eye. This condition is common in miniature breeds of dogs as Toy, Poodle and small Terriers.

Causes:

- 1-Medial lower entropion acting as a wick
- 2-Hair from the caruncle
- 3-Prominence of the globe (exophthalmos) with shallow lacrimal lake
- 4-Obstruction of the lower punctum obstruction
- 5-Nasolacrimal duct
- 6-Congenital absence of the lower punctum or canaliculus
- 7-Localized inflammation along the course of the duct



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8-Excessive tear production secondary to irritation caused by entropion, ectropion, distichiasis, trichiasis, and ectopic cilia.

Symptoms:

Flow of tears outside the eye with tear staining of the medial canthus skin and hair

Treatment:

Try to correct the primary cause after thorough examination of the eyeball and its adnexa.

IX-KERATOCONJUNCTIVITIS SICCA, KCS, DRY EYE, OR XEROPHTHALMIA: -

Definition:

KCS is a disease involving the cornea and conjunctiva results from deficiency of the aqueous portion of the tear film. It is a common condition in dogs and uncommon in cat and rare in other domestic animals.

Causes:

- 1-Congenital absence of the lacrimal glands
- 2-Spontaneous senile atrophy of the glands
- 3-Lack of normal innervation of the glands; may be due to traumatic causes, infection or spontaneously from unknown cause. This results in lack of lacrimal gland activity.
- 4-Trauma to the orbital and supraorbital area damaging the lacrimal gland
- 5-Surgical removal of the nictitans gland of the third eyelid



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6-Systemic diseases, as canine distemper, the cause is a virus affecting the lacrimal and nictitans glands and may result in gland dysfunction.

7-Drug reaction as long term using of sulphadiazine

8- Idiopathic causes; the majority of cases are of unknown cause

Symptoms:

The clinical signs of KCS vary according to the degree of hyposecretion and the duration of the disease, also depending on whether the condition is bilateral or unilateral, acute or chronic and temporary or permanent.

1-Blepharospasm (increased blinking) as a result of intense ocular pain and discomfort

2-Mucoid and mucopurulent discharge. The eye and eyelids are covered with mucoid discharge. Absence of the tears leads to accumulation of the discharge over the eye.

3-Changes of the mucoid thread. As the tear production decreases, mucous production is increased as a protective mechanism for the eye resulting in increase in the size of mucous thread, change in its color into yellow green and becomes adherent to the conjunctiva.

4-Corneal changes. Include, loss of luster, opacity, vascularization, pigmentation and keratinization.

5-Conjunctival changes. Conjunctiva becomes thick, dry and inflamed.

6- Nostrils may be normal or dry.

Diagnosis:



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1-History

2-Clinical signs

3-Schirmer tear test: The average normal tear wetting per minute is 20 mm, suspicious levels are 5-10 mm wetting per minute and most KCS patients exhibit wetting values less than 5 mm per minute.

4-Rose-bengal staining: 0.5% solution is instilled in the eye and the excess is flushed away with normal saline. Rose-bengal stains the degenerated and devitalized corneo-conjunctival epithelium.

Treatment:

1-Medical treatment:

a-Replacement of precorneal tear film by artificial tears as Methyl-cellulose 1%. Frequent instillation is essential.

b-Stimulation of lacrimal secretion; by pilocarpine 1% solution, 1-4 drops added to the food.

c-Remove the excess of mucous by gentle and frequent washing and cleaning of the eyeball and eyelids with 5% acetylcysteine (Mucomyst).

d-Control of infection by using broad spectrum antibiotics as chloramphenicol or gentamycin 4-6 times daily.

e-Anti-inflammatory agent as corticosteroids. It reduces conjunctival inflammation, conjunctival exudates, corneal vascularization and pigmentation.

2-Surgical treatment:



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a-Surgical or cautery ablation of the lower punctum. This method is used to conserve the small amount of tears, if present. This technique has not been successful as KCS is usually absolute condition without any tear production.

b-Surgical reduction of the size of palpebral fissure through lateral tarsorrhaphy. Success of the procedure is dependent on some lacrimal activity.

c-Hydrophilic soft lenses applied to the cornea after application of medication to retains enough moisture and protect the cornea for several hours.

d-Parotid duct transportation: This operation is indicated when the medical treatment have been failed. A minimum of 3 months of medical treatment is desirable before starting surgical therapy as some dogs regain tear production during this time. Before surgical intervention, the function of the parotid salivary gland must be evaluated. This is performed by application of a few drops of 1% atropine ophthalmic solution to the patient's tongue or oral mucosa and observing the papilla of, the parotid duct for profuse salivation, associated with bitter taste of atropine. The papilla is presented adjacent to the caudal aspect of the cranial tooth. The saliva has nearly the same structure of tears and is non-irritant to the eye.

Anatomical consideration:

Surgical exposure of the parotid duct is performed at the cheek area. The skin is thick and facial muscles are thin. The parotid duct is formed by several small ductules emerging from the ventral part of the gland and extends directly across the masseter muscle. The duct opens into the buccal cavity by a small papilla, lateral to the posterior aspect of carnassial tooth. The dorsal and ventral buccal nerves are located in the facia external to the parotid duct above and below it. A connecting branches usually crosses external to the parotid duct. The facial vein also crosses external to the parotid duct.



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Surgical procedure:

The operation is performed under effect of general anesthesia and the check is prepared for aseptic operation. The papilla of the parotid duct is identified near the base of the carnassial tooth. Care should be taken not to confuse it with the papillae of the zygomatic salivary gland, which open near the gingival border above the last molar tooth. A 0 to 2-0 monofilament nylon suture material with a blunt tip (the tip is flamed to be blunt) is passed through the parotid duct papilla. The mucosa anterior to the papilla is grasped rostrally to straighten the duct and facilitate catheterization. The nylon thread can be seen moving beneath the skin and can be felt as it passes in the parotid duct to the gland. After the suture has nearly reached the gland, it is cut 1-2 cm from the papilla. Place a piece of cotton soaked in antiseptic solution over the papilla and return the lip to normal position. As the nylon suture can be 'palpated through the cheek, a skin incision is made along the duct through the skin and facial muscles exposing the duct. Careful dissection of the duct from the masseter muscle is performed and a piece of umbilical tape is used for retraction and elevation of this duct during dissection to prevent its trauma. The duct is dissected free posteriorly to the angle of the mandible or where the duct begins to divide into smaller ductules. Carefully start dissection forward, avoid facial vein and the anastomotic branches between the two buccal nerves. Near the buccal mucosa the duct continues for 1 cm submucosally before terminating in the papilla. A rounded or oval incision of the mucosa around the papilla is performed and the papilla with the mucosa are pulled back into the external facial incision. The oral mucosa is apposed with fine catgut with simple interrupted suture and set aside all instruments used in the mouth. The surgeon should reglove. A canthotomy incision is performed if the palpebral fissure is narrow and eyelid opening is small. With a mosquito artery forceps, a subcutaneous tunnel is made along the surface of the masseter muscle from the angle of the mandible to the lateral canthus. Force the forceps through the conjunctiva and grasp the point with another artery forceps and then withdraw the first one until the tip of the second



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one appears at the facial wound. Grasp the edge of the mucosa, containing the papilla, with the forceps and draw the duct through the tunnel to the eye. 4 simple interrupted 6-0 chromic catgut sutures are placed apposing the mucosa around the papilla to the conjunctiva. The skin and canthotomy incisions are closed as usual. A closed technique eliminates the need for facial incision has been practised with a great chance for kinking, twisting and damaging the duct. In this procedure the oral mucosa plug is performed and dissection is continued around the duct to the angle of the mandible. Next, tunnel is formed from the conjunctiva! fornix to the angle of the mandible and the mucosa with the papilla is transpositioned to the conjunctival sac.

The papilla is fixed to the conjunctiva as mentioned before and the oral wound is closed. Such technique is difficult and blind dissection usually results in many complications.

Postoperative care:

- 1-Topical antibiotic-corticosteroid, 4-6 times daily.
- 2-Systemic antibiotic, 7-10 days.
- 3-Diuretics are recommended in cases of facial edema.
- 4-Skin stitches are removed in 7-10 days.
- 5-A drop of atropine is applied to the tongue postoperative! y to check for duct patency.
- 6-Epiphora during eating is the common complaint.

Postoperative complications:

- 1-Twisting or torsion of the duct during operation may be exhibited by intermittent reduced or absent secretion.



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2-Stenosis of the duct due to fibrosis in certain areas along its course. Removal of fibrotic tissues at the seat of stenosis can be performed.

3-Atrophy of the parotid gland is rare.

4-Corneal and periocular crystalization occurs in rare cases. In such cases a mineral-like deposit is formed over the cornea and eyelids. It is usually non-irritating.

SCLERAL AFFECTIONS

I-CONGENITAL ANOMALIES: -

1-Melanosis of the sclera in dogs: -

Melanin deposits sometimes be seen in animals less than one year of age at the sclera and cornea. It appears in a form of diffuse superficial plaques or in a form of firm nodules.

2-Coloboma of the sclera: -

Congenital absence of a segment of the sclera. It is seen in Collies and related breeds. The typical coloborna are seen affecting the optic nerve but it may occur in the sclera near the optic nerve or extend forward to the equator.

3-Scleral ectasia(thin sclera): -

This condition known as Collie ectasia syndrome or Collie eye anomaly. Scleral ectasia or lack of scleral development is observed in Albino or subalbinotic animals, Collie eye syndrome, Sheltie eye syndrome, Australian Shepherds, Siamese cats and appaloosas horses. The control of the condition is accomplished by removal of all affected dogs from the breeding programs.

Symptoms:



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- | | |
|---|-----------------------------------|
| 1-Chorioretinal dysplasia of the globe | 2-Colobomas at the posterior pole |
| 3-Tortousity of the retinal blood vessels | 4-Retinal detachments |
| 5-Intraocular hemorrhage | 6-Central corneal opacity |

II-ACQUIRED DISEASES OF THE SCLERA: -

Acquired disorders of the sclera are not common in domestic animals. Because of the inert collagenous nature of the sclera and its relatively poor blood supply, involvement of the sclera in disease processes is rare.

1-Episcleritis: -

Definition:

It is a localized nodular or diffuse inflammatory disorder affecting the episcleral tissues near the limbus. The nodules are immovable and the conjunctiva is freely movable over them in nodular form. The episcleral vessels are engorged with blood and overlying conjunctiva is congested and red in diffuse form.

Treatment:

Topical and subconjunctival corticosteroid administration.

2-Ocular nodular fasciitis (ONF): -

Definition:

It is a benign nodular lesions of connective tissue in the sclera, cornea and/or third eyelid. The lesions are localized and must be differentiated from nodular episcleritis, proliferative keratoconjunctivitis and focal neoplasms.

Treatment:



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Surgical excision, as there is no respond to topical medication of corticosteroids.

3-Scleral tumors: -

Primary tumors of the sclera are uncommon. Melanomas or malignant melanomas are seen. Extension to the sclera from other tissues are more common. Squamous cell carcinomas are the common tumors extended from the conjunctiva and cornea in horse and cattle. Haemangiosarcomas and malignant melanomas are most likely to occur in dogs.

4-Episcleral hemorrhages: -

It has been previously described as subconjunctival hemorrhage.

5-Scleral trauma: -

Scleral trauma may leads to lacerations or perforation of the sclera. In equines the cause is severe blows to the eye while in small animals is due to fights with other animals or auto accidents. The ciliary body, iris and/or lens may prolapse through scleral wound. The extent of internal hemorrhage and retinal detachment determines if the eye will be visual following repair. The prolapsed tissues are replaced and the scleral wound is sutured with 6-0 non absorbable suture material.

6-Episcleral prolapse of periorbital fat in cattle: -

The postorbital fat can displace anteriorly between the sclera and Tenon's capsule to prolapse into the episcleral space. The condition may be congenital, or due to abnormal ocular muscle function. Exaggerated eye movement during examination may result in transient prolapse of fat.

Treatment:

The condition is not routinely treated because it does not affect vision.



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