

DISEASES OF LENS IN ANIMALS

Anatomical considerations:

- Lens is a crystalline transparent body suspended in the anterior portion of the eyeball between the aqueous and the vitreous.
- It is set in a depression in the anterior surface of the vitreous chamber called *patellar fossa*.
- Anteriorly the iris rests on the lens surface.
- The lens is completely enclosed within elastic capsule and is held in position by *suspensory ligaments (zonules)* which are numerous and dense.
- The lens consists of a peripheral portion, the *cortex* and a central part, the *nucleus*.
- It is devoid of blood vessels and gets its nutrition from the intraocular fluids.
- The formation of new lens fibers takes place throughout the life pushing the older fibers towards the center. This leads to an increase in the density of the lens from surface to the center i.e. nucleus.

AFFECTIONS:

1. **Aphakia:** Congenital absence of the lens.
2. **Microphakia:** Congenital abnormally small lens.
3. **Lentiglobus:** Congenital with posterior portion of the lens in spherical contour.
4. **Lenticonus:** When posterior portion of the lens has conical protrusion.
5. **Coloboma:** Congenital notching of the lens.
6. **Dislocation of lens:**
 - An uncommon condition.
 - The disease condition is prevalent in horses, ox, dogs and cats but most frequent in horses.
 - **Etiological factors** include external violence, hereditary, increased intraocular pressure over a long period.
 - Dislocation may be **incomplete (subluxation)** when there is slight displacement without getting detached from the iris and vitreous body or **complete (Luxated)** when lens gets detached and lies in the anterior chamber or any where.

Clinical signs:

- When intraocular pressure is not increased, an area of increased light reflection is observed in the area of pupil.
- When IOP is increased, all the signs of glaucoma are seen which include red eye, reduced or absent light reflexes, pain, corneal haze, congestion of conjunctival and scleral vessels and increased IOP.

There is loss of vision.

- When there is complete luxation, the lens becomes opaque and is easily visualized regardless of its position.

Treatment: Extraction of lens is a recommended treatment.

7. **Cataract:** Opacity of lens or its capsule, mostly seen in dogs, cats, horses, ox, goats etc.

- The term is derived from a Latin word '*cataracta*' means 'waterfall' and a Greek word '*kataractis*' means 'break down'.
- The condition develops due to the opacification of lens fibers and change in the water content of the lens. There is disruption of lamellar architectural arrangement of lens fibers or its capsule which results in the loss of the transparency of the lens.

Classification:

- **Capsular or False Cataract:** When the lesions are present in the capsule.
- **Lenticular or true cataract:** When the lesions are present in the lens itself.
- **Capsulo-lenticular or mixed**
- **Depending upon the etiology:**
 - **Developmental cataract:** Congenital or juvenile cataract. The congenital cataract are not common, may be caused by persistent pupillary membrane. Juvenile cataracts (early) are mostly seen in poodles, cocker spaniels, schnauzers, Boston terriers and Afghan hounds.
 - **Traumatic cataract:** Due to certain external violence and resultant perforating wound.
 - **Senile cataract:** Seen in the old age.
 - **Diabetic cataract:** Seen in Diabetes mellitus.
 - **Radiation cataract;** Rare in animals.
 - **Hereditary cataract:** In Miniature Schnauzer, Golden Retriever and Labrador.
 - **Toxic cataract:** In naphthalene poisoning, uremia, drug toxicity (pilocarpine) and certain metallic toxicity (Thallium, Cobalt and Selenium).
 - **Complicated cataract:** Secondary to other ocular disease like uveitis, lens luxation, retinal detachment, intraocular tumors and glaucoma.

Stages of cataract:

- **Incipient stage:** Beginning of cataract when streaks or vacuoles are

seen in the nucleus or just inside the posterior capsule. The vision is normal.

- **Immature stage:** There is cloudiness of the lens but fundic reflex (Reflection of light from the tapetum) is still present. Slight difficulty in walking.
- **Mature stage:** There is shrinkage of the lens with complete opacity. The fundic reflex is absent. The cataract is often referred as 'ripe' cataract.
- **Hypermature stage:** There is further decrease in the size of the lens with liquefaction of the cortex. The lens appears milky or speckled in the appearance. Finally the nucleus may sink to the bottom (Morgagnian cataract) and may be there is return of the vision.

Symptoms and diagnosis:

- History of progressive loss of vision.
- Focal or diffuse opacity of the lens.
- The lens appears '**pearly white**'.

Treatment:

A) Medical treatment:

- The aim of medical treatment is to promote the absorption of inflammatory exudates. Many drugs have been tried like Catamed or Cataline 1-2 drops twice daily. Homeopathic medicine 'Senararia' can also be tried.
- Other drugs which have been tried are iodine, calcium, cysteine, sulfonamides, acetazolamide preparations for topical use.
- The success rate with medicinal treatment is very less and it is believed that any apparent improvement in the vision was not due to the medication but probably due to spontaneous cataract resorption.
- 1-2% topical atropine can be used twice weekly to dilate the pupil and enhance the vision.

B) Surgical treatment: Surgical removal of the cataract lens is done under general anaesthesia. This requires many preoperative considerations like type of cataract, age of the animal etc. The success rate is not always 100% (normally 40-80%). The aim of surgical treatment is to restore aphakic vision.

- Mostly two methods of lens extraction are recommended i.e. **Extracapsular** (the anterior capsule of lens is removed and lens content is expelled) and **Intracapsular** removal (no opening is made in the capsule and the zonular attachments are severed and the lens is delivered within the capsule).

- Various methods which can be employed for the removal of the cataract lens are: Ultrasonic fragmentation, Aspiration technique with needle or after fragmentation.