

CUVS CLINICAL BRIEF

LENS INSTABILITY IN DOGS AND CATS

Evaluation of lens position is important in any patient presenting for ocular discomfort, redness, cloudiness, or visual deficits. This clinical brief will review key points regarding lens position, tips for detection of lens luxation, clinical implications and treatment.

Lens Position and Detection on Examination

In health: The lens sits behind the iris/pupil, contacting the aqueous humor anteriorly and the patellar fossa of the vitreous posteriorly. The lens is held in place by zonules running from the lens equator to the ciliary processes posterior to the iris.

→ Even with maximal dilation, the equator (periphery) of the lens should never be visible.

Subluxation: Partial loss of zonular attachments leads to shifting of lens position, but the lens remains approximately in its normal anterior-posterior location.

→ A portion of the equator of the lens becomes visible if the pupil is mid-range to dilated, leaving an “aphakic crescent” – or a crescent of space behind the pupil where there is no lens.

→ Phacodonesis and iridodonesis (shaking of the lens or iris, respectively) may occur.

Anterior luxation: The lens has lost all or most zonular attachments and has become dislocated into the anterior chamber, in front of the iris.

→ Secondary glaucoma is likely to develop due to pupillary block; this may lead to significant corneal edema. Use a bright light source in a dark room to look for the arc of the lens equator in the anterior chamber.

→ A central white corneal opacity/area of more severe edema should trigger close examination for anterior lens luxation.

→ The pupillary margin is no longer visible with an anterior lens luxation.

Posterior luxation: The lens has lost all or most zonular attachments and has become dislocated into the vitreous (associated with vitreal liquefaction or syneresis).

→ Use a bright light source in a dark room to look down into the vitreous, as the lens often settles ventrally.



Lens subluxation and buphthalmos



Hypermature cataract anterior lens luxation



Iris atrophy with posterior lens luxation

Etiologies of Lens Subluxation/Luxation

- Genetic or primary lens instability (canine, particularly common in terriers).
- Secondary to: chronic glaucoma (sub- or posterior more common than anterior luxation); chronic hypermature cataract; chronic uveitis (rare in dogs, most common cause of lens instability in cats); trauma (comorbidities will be present); congenital malformations; and intraocular tumor formation.

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Clinical Importance and Treatment

Lens subluxation. The patient is at risk of luxation, glaucoma, uveitis, and retinal detachment; patient may be suffering from glaucoma or chronic uveitis. If the etiology is presumed to be inherited (as is the case in most dogs), the second eye is at risk. Proactive owners may wish to pursue surgical lens extraction to minimize the risk of vision loss and the need for emergency procedures. Many cases are treated with a topical miotic agent (e.g., latanoprost) to minimize the risk of anterior lens movement through the pupil. Topical anti-inflammatories may be indicated. Benign neglect with monitoring of lens position and IOP every 4-6 months may be most appropriate in some cases. Underlying causes should be addressed where able.

Anterior lens luxation. This is commonly associated with markedly elevated intraocular pressure that is poorly responsive to medical therapy until the lens is removed from the anterior chamber.

Tip: Attempt to measure IOP via the peripheral cornea, as a central measurement will often be misleadingly high due to contact between the cornea and the lens.

Medications:

- Analgesics/anti-inflammatories systemically; topical anti-inflammatories.
- Topical antiglaucoma medication

Appropriate: Dorzolamide hydrochloride +/- timolol maleate

Contraindicated: Latanoprost, demecarium bromide, pilocarpine (miotics) – will exacerbate pupillary block glaucoma

Time frame: Immediate referral if IOP is elevated and one is attempting to save vision.

Surgical options include:

- Lens extraction – performed on an emergency basis if IOP is elevated.
- Transcorneal reduction of anterior lens luxation (TRALL) – successful only in a subset of patients, this procedure aims to break pupillary block to relieve glaucoma by pushing the lens into the back of the eye.
- Enucleation - if chronically elevated IOP or if suspect complete and permanent vision loss.

Posterior lens luxation. Better tolerated by the eye than anterior lens luxation. Loss of a functional lens results in farsightedness. Risk of retinal detachment, anterior luxation, glaucoma. Although planned extraction is offered in some cases, many patients are simply monitored or treated with a topical miotic agent.

Summary

Acute anterior lens luxation is a surgical emergency, whereas subluxation and posterior luxation require prophylactic or symptomatic therapy, monitoring, or elective lens extraction. Any dog (particularly a terrier) presenting with sudden onset of ocular discomfort and elevated intraocular pressure should be carefully assessed for anterior lens luxation, as miotic antiglaucoma agents are strongly contraindicated.



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