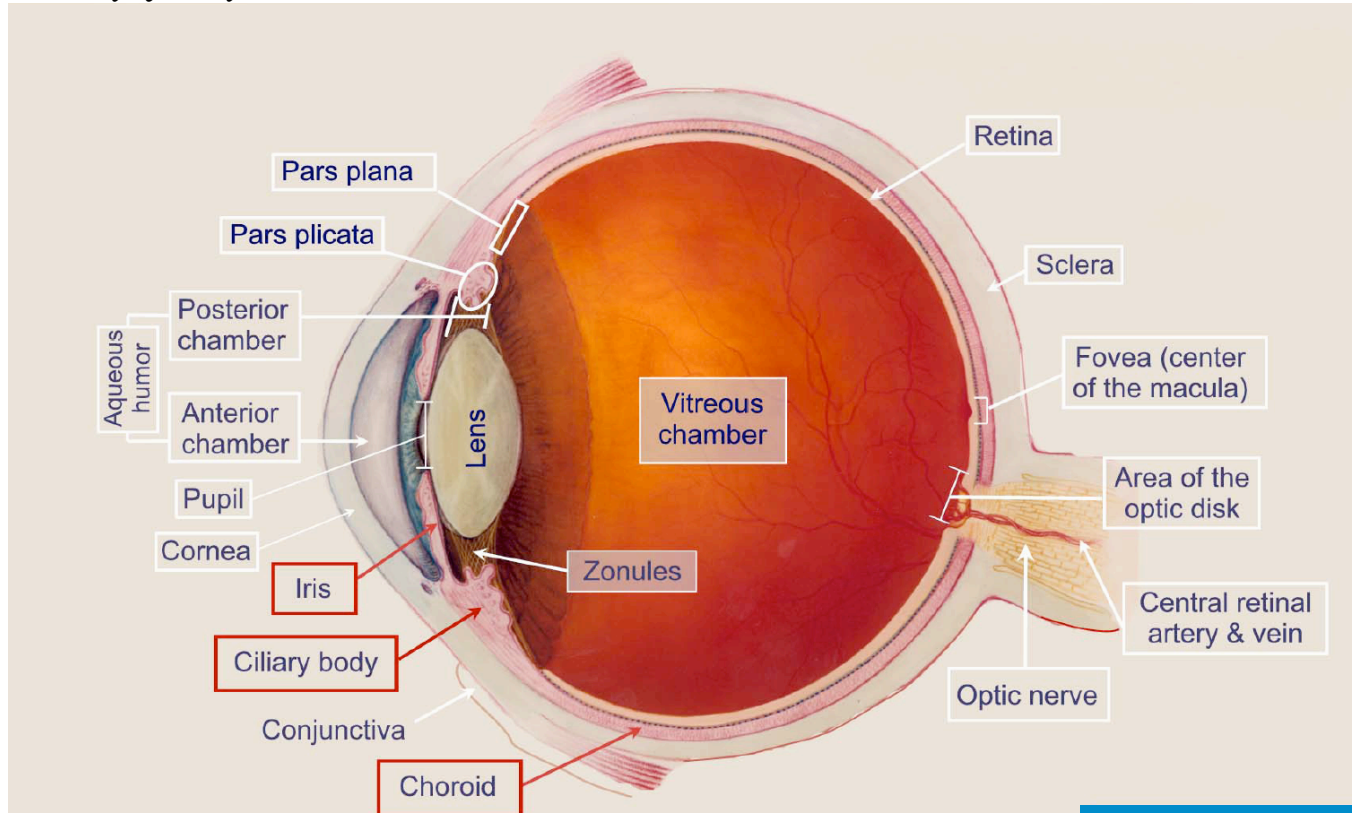


Lens Luxation in Dogs

Anatomy of the eye



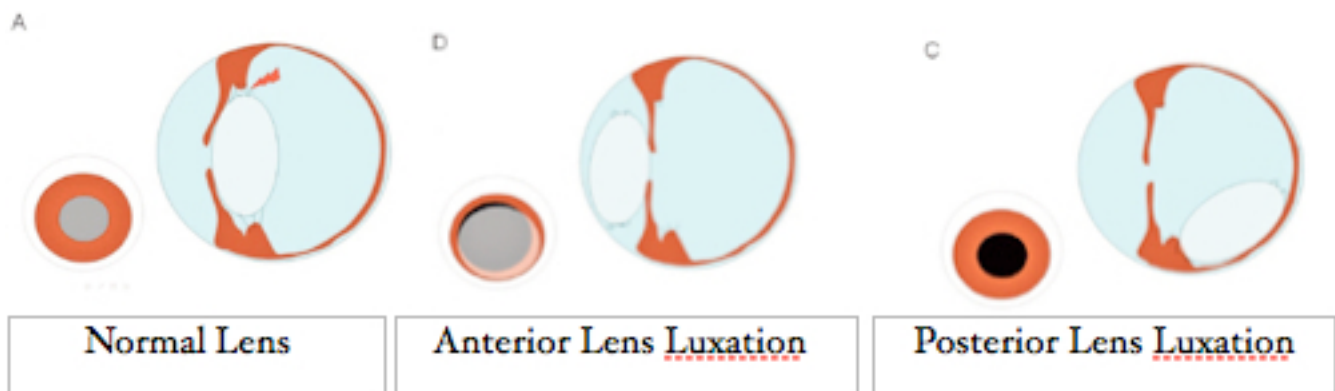
The Lens

The **lens** is a transparent structure behind the iris. The pupil is an opening in the iris which opens and closes to adjust the amount of light entering the eye based on the brightness of the environment. The lens is held in position by the **zonules**- small ligaments that connect all around the periphery. These hold the lens in position much like a round trampoline is held to it's metal frame.



WHAT DOES LENS LUXATION MEAN?

The word “luxate” means to dislocate. A lens luxation occurs when the zonules break and the lens is able to dislocate from its normal position within the eye. In dogs, the majority of cases of lens luxation are a result of an inherited weakness in the zonules- i.e. it is a genetic condition. These begin to break relatively early in life, and when all have broken the lens is free to luxate. This is an inherited condition in many breeds, including the Parson’s Russell Terrier, Rat Terrier, Chinese Crested, and many others. Occasionally zonules will break down due to advanced age or due to chronic cataract formation. As discussed above, the zonules hold the lens firmly in position like a round trampoline held sideways behind the pupil. When the eyes move back and forth, or the head swings from place to place during normal activity, momentum places stress on these ligaments. Normal zonules handle this stress just fine, but the weakened zonules in a dog with inherited lens luxation start to snap. As more and more zonules break, the lens can move slightly with ocular motion, increasing the stresses, breaking more zonules. This “wiggling” of the lens leads to damage of adjacent structures (see section on glaucoma below), and eventually the lens becomes completely detached. At this point it is free to move either forward through the pupil into the front of the eye (**anterior lens luxation**), or back onto the floor of the vitreous cavity (**posterior lens luxation**).



WHAT HAPPENS WHEN THE LENS LUXATES?

If the lens luxates posteriorly, you might not notice a change in your pet. Vision in the eye is affected- without a lens they can still see, but become significantly far-sighted. Anterior lens luxation is far more significant. When the lens comes forward through the pupil into the **anterior chamber** it contacts the inside of the cornea, resulting in discomfort. As the lens pushes other structures out of the way this can plug the drain inside the eye, resulting in a severe increase in intraocu-

lar pressure. Increased intraocular pressure is **glaucoma**- this is the most common cause of vision loss with lens luxation. Uncontrolled glaucoma leads to permanent damage to the visual structures in the back of the eye (optic nerve, retina) and can be very painful. Once the pressure increases, chances for preserving vision or comfort decrease significantly. Other than plugging the drain, a dislocated lens can also result in the retina detaching from the back wall of the eye, and chronic contact between the lens and the inside of the cornea can lead to permanent corneal opacity and recurrent corneal ulcers.



HOW CAN I TELL WHETHER MY DOG IS DEVELOPING A LENS LUXATION?

If your dog is one of the predisposed breeds or has a relative with lens luxation the good news is that there is now a blood test for the defective gene that causes this condition. More information regarding this test is available at: <http://www.offa.org/dnatesting/pll.html>. If your dog has tested positive for the gene, then periodic examination by an ophthalmologist starting at 12 months of age is the best way to catch lens instability before it breaks free completely.

HOW IS LENS LUXATION TREATED?

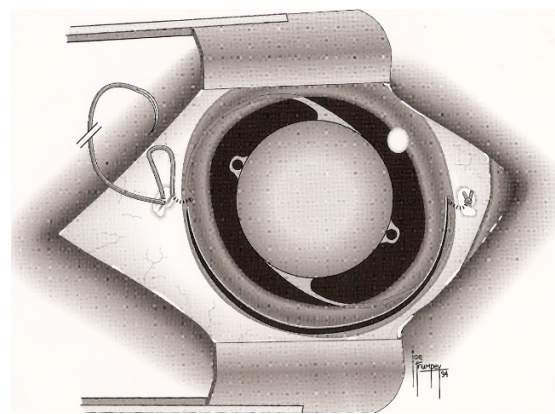
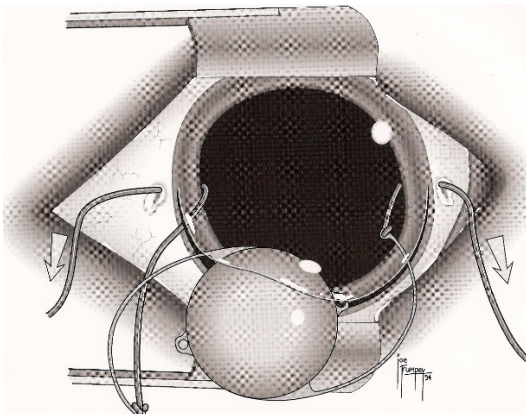
Treatment options depend upon the status of the eye at the time of diagnosis. Our goals are to preserve vision if possible, comfort for certain. If the eye is otherwise healthy, then removing the lens is the best treatment. Without a lens the patient will still have vision, but will be far-sighted. Anything closer than 3-4 feet will be increasingly out of focus. Sometimes we are able to suture an artificial lens into the eye in order to maintain normal focus. The chances of success after surgery depend upon how much damage was done to the inner workings of the eye before hand. The main complications afterward are the same as without surgery- glaucoma and retinal detachment. Both of these complications are possible **even after successful surgery** because the lens may have caused significant damage to the drain and/or the retina while it was loose and wiggling well before it finally broke free altogether. The damage to these structures is not visible, even with the instruments we use to examine the eye. We can tell that there is significant damage only when we see resulting problems- increased intraocular pressure or retinal detachment. The very best candidates



for surgery have about an 85% success rate- the 15% failure is a result of glaucoma or retinal detachment afterward. Either of these can occur days, weeks, months, or years down the road. These complications can sometimes be controlled or repaired with additional medications or surgery, but permanent blindness and chronic discomfort requiring eye removal (or more cosmetic alternatives) is always possible.

Your ophthalmologist will discuss your pet's prognosis with you at

the time of the examination. If surgery is not an option and the lens has not yet come forward into the front of the eye then long term drops to keep the pupil as small as possible can help discourage anterior luxation. If the lens remains behind the pupil then it is less likely to cause glaucoma and significant discomfort.



WILL MY PET LOSE VISION COMPLETELY?

This is possible- even with all available treatment. Your doctor will discuss the prognosis for your pet based upon the stage of disease and treatments selected. It is important to keep in mind that most blind dogs have an excellent quality of life as long as comfort is maintained. Not only are they in a protected and loving environment, dogs use vision very differently than humans with their other senses far more developed than ours. Sudden vision loss will take a longer period of adjustment than a gradual decline, but in either case most owners report that their pets adapt remarkably well.