



Animal Eye Clinic

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PROGRESSIVE RETINAL ATROPHY (PRA)

What is PRA?

Progressive retinal atrophy, also known as progressive retinal degeneration (PRD), refers to several different retinal diseases that cause blindness.

The retina is a complex tissue located at the back of the eye. Light strikes the retina and starts a series of chemical reactions that cause nerve impulses. These impulses pass through the layers of the retina to the optic nerve, which carries the information to the brain where it is interpreted into vision. The cells that react first to the light are called photoreceptors. There are two types of photoreceptors: rods and cones. Rod photoreceptors respond best in low light situations and are therefore responsible for night vision, while cones respond best in bright light and are therefore responsible for day vision.

In PRA there is progressive degeneration leading to death of the photoreceptors. The rod photoreceptors degenerate first followed by the cones. This presents as an initial loss of night vision and eventually progresses to a complete loss of vision.

Two distinct patterns of PRA have emerged. In the first, a dysplasia causes abnormal development of the retina leading to blindness. In the second, the degeneration is a slow progressive death of the retinal tissue that leads to blindness.

Depending on the breed of dog, the age at which the problem starts and the speed with which blindness develops varies.

What causes PRA?

PRA is an inherited condition that usually affects purebred dogs. The pattern of inheritance differs with each breed, but it is generally an autosomal recessive condition. This means that both parents must carry the gene in order for their offspring to exhibit the disease. However, carriers may have normal eyes and vision. Commonly affected breeds include:

Airedale Terrier	English Springer Spaniel	Portuguese Water Dog
Alaskan Malamute	German Shepherd	Rhodesian Ridgeback
American Cocker Spaniel	Golden Retriever	Rottweiler
Australian Cattle Dog	Great Dane	Samoyed
Beagle	Greyhound	Scottish Terrier
Border Collie	Irish Setter	Sealyham Terrier
Borzoi	Labrador Retriever	Shar Pei
Brittany Spaniel	Lhasa Apso	Shetland Sheepdog
Chesapeake Bay Retriever	Maltese	Shih Tzu
Chihuahua	Miniature Schnauzer	Siberian Husky
Chow Chow	NS Duck Tolling Retriever	Silky Terrier
Collie	Old English Sheepdog	Viszla
Dachshund	Pekingese	Welsh Corgi
Doberman Pinscher	Pomeranian	Whippet
English Cocker Spaniel	Poodle	Yorkshire Terrier

What are the signs of PRA?

PRA is not a painful condition and therefore most people will not recognize the early stages of this condition. The earliest indication that anything is wrong will be difficulty with night vision. This is usually recalled in the history taking as a reluctance to navigate in the dark, and disorientation in the dark, even in familiar surroundings. Some people may notice an increased 'shine' in their pet's eye, due to a dilated pupil that doesn't respond as quickly to light.

Sometimes the first notice of disease is the appearance of cataracts in the lens. Due to the death of the photoreceptors, toxic substances are released into the eye. These substances cause cataracts later on in the disease process. Although the cataracts are not painful, they may cause inflammation inside the eye that may require treatment.

How is PRA diagnosed?

The veterinary ophthalmologist can diagnose PRA by evaluating the retina's appearance using an indirect ophthalmoscope. Dogs with PRA will have characteristic changes in the retinal blood vessel pattern, in the optic nerve head, and in the tapetum (reflective substance in the eye).

In cases where it is not possible to evaluate the retina directly (i.e. in the presence of cataracts), an electroretinogram (ERG) can be performed. An ERG is used to evaluate the retinal function. A contact lens is placed on the eye and two small electrodes are placed under the skin. A bright light is flashed into the eye and the electrical response of the retina is recorded. The ophthalmologist will evaluate the resulting wave. A healthy retina will produce a characteristic waveform, while a degenerating retina will only produce a flat line. The ERG is sensitive enough to diagnose dogs with PRA before they begin to demonstrate clinical signs of the disease.

Can PRA be treated?

Unfortunately there is no treatment for PRA. The disease will progress to blindness in every case. Due to the progressive nature of this condition affected dogs learn to compensate for their disability as their vision worsens. It is important to remember that this disease is not painful. Your pet can live a long and happy life without vision.

Can PRA be prevented?

PRA can only be prevented by the removal of animals from breeding programs that carry the gene for the condition. Veterinary ophthalmologists often perform certification examinations on breeding animals and their offspring in order to help detect animals that may be carriers. It is important that breeders be aware of PRA and have their animals examined regularly.

Genetic testing to detect carriers of the PRA gene has been developed for certain breeds of dogs.

Resources:

Living With Blind Dogs: A Resource Book and Training Guide for the Owners of Blind and Low Vision Dogs – Second Edition, Caroline D. Levin RN

http://www.petcarebooks.com/books/living_blind.htm