Primary Glaucoma with Reference to the English Springer Spaniel

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You should have no doubts about the fact that the type of primary glaucoma which occurs in the English Springer Spaniel is the most devastating ocular disease the middle-aged dog could suffer. It is known as angle closure glaucoma and it is characterised by sudden onset blindness and pain, both of which prove so very difficult to treat that a life without sight is the usual prognosis for the patient. Such is the pain and the damage to the eye that enucleation may prove necessary in many instances. It is a disease to be avoided at all costs, but sadly the type of inheritance involved is unknown. This always renders breeding advice difficult for such advice lacks the required specificity for ease of selection of the right genotype and will make the future development of a DNA based test really difficult. Fortunately , although not 100% reliable, a relatively simple clinical diagnostic test is available to give guidance in breeding programmes. The test is called gonioscopy and it allows the identification of those dogs which may be predisposed to glaucoma : in your breed a once only examination is all that is required and it can be done from 4 months of age onwards. But let me begin at the start of the story.

The eye contains a fluid called the aqueous which serves the same purpose as a blood supply to the cornea and the lens. As such there is a circulation of this fluid inside the eye : aqueous is produced from blood by structures known as the ciliary processes and once it has circulated inside the eye to provide oxygen and glucose to the cornea and lens it is taken back into the blood stream within a part of the eye known as the ciliary body. Angle closure glaucoma is due to the obstruction of aqueous uptake by the ciliary body. This latter contains a space, the ciliary cleft, which extends around the 360 degrees of the eye into which the aqueous passes to move back into the blood vessels. In angle closure glaucoma the ciliary cleft closes within a matter of a few seconds and because the aqueous cannot escape the eye, but its production continues, the fluid pressure inside the eye rises to double or treble its normal value. This causes pain and the increased pressure destroys cells within the retina so quickly that often treatment is started too late to restore eyesight.

So, the mechanism involved in Springer Spaniel primary glaucoma is the closure of the ciliary cleft (the space) within the ciliary body. Gonioscopy allows the examination of the entrance to the ciliary cleft. In the normal dog the entrance is wide open (2mm), but in glaucoma predisposed dogs the entrance is narrowed as the result of what is called pectinate ligament dysplasia (PLD). In normality the entrance to the ciliary cleft is spanned by strands or fibres of a structure referred to as the pectinate ligament (the Latin word “pecten” means comb- like),so this ligament has the appearance of a long comb whose teeth are 2mm long. In PLD the teeth do not form properly and the entrance to the ciliary cleft is narrowed and partially occluded as a result. It is this narrow entrance which suddenly closes to deny aqueous outflow in

angle closure glaucoma. Why the “angle” in the terms “narrow angle” and “angle closure” – well the entrance to the ciliary cleft lies at the angle formed by the cornea and the iris.

So, all that is all straightforward. Predisposed dogs are born with narrowed angles as a result of PLD and it is the narrow angle which closes to give rise to angle closure glaucoma. (The word “primary” simply means inherited).Gonioscopy will identify the predisposed dog before the disease occurs. However, the exact mechanism involved in the closure of a narrowed angle is not totally understood, but what is universally accepted is that PLD is the marker for angle closure. Thus gonioscopy is such a useful examination to be used in the assessment of breeding animals. Rather avoidance through safe breeding than the production of predisposed and glaucomatous animals because treatment is so very difficult. I have already said that by the time veterinary assistance is sought it is too late to save the retinal cells, but even if that treatment is instituted early enough all that can be done is to slow down the speed of the progression of blindness. The good news is that there is evidence to suggest that glaucoma treatment started in predisposed dogs before glaucoma occurs can be invaluable in preventing or delaying the onset of the disease.

Thus, I cannot advocate the value of gonioscopy enough – it allows the identification of predisposed stock, stops their use in breeding programmes and alerts the clinician to the use of prophylactic treatment. The incidence of primary angle closure glaucoma in your breed is not known, but it is low and routine gonioscopy should prevent the problem becoming commonplace.Keep up with the examinations for PRA and RD,and use gonioscopy to help you breed healthy stock.

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