Title: Cavalier Possibly SM-Free Within a Few Generations

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Background

In 2009, the BBC documentary "Pedigree Dogs Exposed" caused quite a stir in the world of dog breeding. Health problems resulting from inbreeding were highlighted, and the Cavalier King Charles Spaniel was one of the breeds that did not come off well in the documentary.

The neurological disorders Chiari-like malformation (CM) and syringomyelia (SM) were found to occur very frequently in Cavalier King Charles Spaniels and can cause serious clinical symptoms. The first article describing these disorders in Cavaliers dates back to 1997. This publication, now 27 years old, involved two Cavaliers that were constantly scratching. MRI scans revealed that they had CM and SM. CM is the herniation of the cerebellum (the small brain) through the foramen magnum (the opening at the base of the skull). SM is the formation of cavities in the spinal cord.

Research

Following this discovery, several Dutch and English breeders had their dogs examined with MRI. The numbers were striking: almost all Cavaliers had CM, and more than 46% had SM. The documentary's broadcast caused a major reaction in England in 2009, and the same happened in the Netherlands a year later. The media, politics, and society got involved, and breeders were publicly shamed. Dutch broadcaster BNNVARA later made a similar documentary titled "End of the Purebred Dog."

Political Agenda

As a result of these documentaries, numerous newspaper articles appeared about purebred dogs and their many defects, and various parliamentary questions were asked. The issue of sometimes very sick purebred dogs suddenly became a political topic. The then State Secretary Bleker ordered representatives of the Cavalier Club Netherlands (CCN) and the Dutch Kennel Club (RvB) to create a concrete plan to improve the breed. At that time, several other disorders had already been described in Cavaliers: a middle ear problem called PSOM, Episodic Falling, pancreatitis, and a leaking heart valve. The Cavalier was undoubtedly a breed with issues.

Agreement

The CCN and RvB, in consultation with the author of this article, then made an agreement stating that all breeding dogs would undergo a heart ultrasound at the age of one, be listened to annually, and have an MRI scan at least at ages one, three, and five. All Cavaliers with a heart murmur would be excluded from breeding, and the results of these MRI scans would be used according to a breeding advice scheme developed by the British Veterinary Association and The Kennel Club (BVA/KC). In short, the guideline was: do not breed with Cavaliers showing clinical symptoms and avoid high-risk crosses. However, only a portion of the large number of affected Cavaliers developed clinical symptoms—about one-tenth, it was estimated. Still, this was a significant number, justifying the need for an effective breeding policy.

Heredity and New Advice

In 2017, researchers from the Expertise Center for Genetics in Veterinary Medicine (ECGD) investigated the effectiveness of the BVA/KC scheme. What was the heritability of this scheme, and what if you selected more

strictly? Unfortunately for the BVA/KC, the heritability of the scheme was found to be very low. The non-binding advice became: use only older Cavaliers that are free of SM. SM manifests in the first years of life, and up to the age of three, dogs could still develop it. After that age, the chance that a Cavalier who was SM-free at that time would still develop it was minimal. The author of this article has pointed out this advice to breeders in various countries at different times. Some breeders continued to use the ineffective BVA/KC scheme, while others set the bar higher and chose to use only older parent dogs or only older Cavaliers with minimal abnormalities.

Recent Research

The effect of this MRI-based selection was recently re-examined and published in Frontiers in Veterinary Science. PhD candidate Citlalli Limpens, affiliated with the ECGD, addressed the following question: 'What if breeders of Cavalier King Charles Spaniels use only older, unaffected animals? What does this mean for the offspring? And conversely, what if they don't?' Using data collected over more than twenty years from over 2,100 Cavaliers from the Netherlands and Denmark, this was investigated. The conclusion: breeders who use only older, unaffected Cavaliers have a much lower chance of producing affected offspring. Conversely, breeders who do not follow this practice have a much higher chance of producing affected (sick) dogs. It is therefore possible to make the Cavalier King Charles Spaniel free of SM. And if done properly, it does not have to take 27 years.

Abolish the Breed?

Of course, SM is not the only issue in this breed; there are at least eleven other hereditary disorders. One could ask whether it would be better to abolish such a breed. But if this were to apply to the Cavalier, then several breeds would have to be abolished. Recent research has shown that CM and SM also occur frequently in the Pomeranian, and a publication in preparation describes that it occurs in all toy breeds. The author is not in favor of banning, but of improving. Our recent publication describing the effect of selection with MRI shows clearly: when breeders use only unaffected dogs, the frequency of SM can be reduced and possibly eliminated within a few generations. This does not solve the other problems, but with the help of, for example, the Fit2breed breeding guidance program, it should be possible to save the purebred dog from extinction. In any case, this recent research shows that with targeted selection, it is possible to reduce the frequency of even such a complex disorder as SM.

References:

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For all references, visit www.onzehond.nl/gezondheid/cavalier-cm-sm

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