Philip Moses Memorial Lecture (Part 2) : Beyond BOAS - welfare challenges in Brachycephalic breeds

Brachycephalic dogs have become popular dog breeds over the past 10 years worldwide. The French Bulldog is currently the one of the most popular pet breeds in Australia. Brachycephalic breeds have significant anatomical abnormalities associated with their phenotype. This phenotype is a direct result of selective breeding and is unfortunately getting worse. As well as significant airway issues the brachycephalic breeds have many other specific breed related issues. There are many dozens listed. This lecture initially focuses on some of breed specific problems occurring in the brachycephalic breeds that are not primarily airway associated. We examine many of the problems in brief – with a focus on awareness of the conditions within the breeds. Commonly encountered problems in these breeds include Chiari like malformation and syringomyelia, cleft palate, dystocia, aerodigestive disease, congenital vertebral malformation (hemivertebrae), ingrown tail, hydrocephalus, intervertebral disc disease, pug dog encephalitis, spina bifida.

The last part of the lecture is a focus on some of the welfare issues that we have created by developing the brachycephalic dog breeds. We will discuss how to approach the many welfare problems and what steps can be taken by veterinarians to try and improve the welfare of brachycephalic breeds. There is little doubt that the loss of genetic diversity and focus on specific traits has led to the increased incidence of many genetic and hereditary abnormalities and specific disease conditions in these breeds.

The welfare issues affecting brachycephalic dogs requires a multi-faceted approach:

1) Firstly, the individual animal must be treated. Their airways should be assessed between 6 and 12 months of age by a suitably experienced veterinary surgeon. Early surgical intervention will help prevent secondary changes developing such as laryngeal collapse.

2) Secondly, brachycephalic dog owners or any clients interested in owning a brachycephalic dog must be educated and fully informed of the health and welfare implications of BOAS and vertebral body abnormalities, including the potential costs associated with managing these disorders.

3) Breeders must be educated on the genetic disorders present in these breeds. Breeders must work to improve the phenotype of these breeds to reduce the incidence of BOAS and vertebral body abnormalities. Individuals must be selected for breeding on the basis of healthy airways and spinal columns.

4) Lobby the Kennel clubs to update the breed standards for brachycephalic breeds. Veterinarians must use evidence-based medicine to support these changes.

To improve the health of extreme brachycephalic breeds, two initiatives should be undertaken:

1) Cranial phenotypic screening: Dogs with a muzzle length less than a third of the skull length (the “craniofacial ratio” - CFR) must not be bred or shown. In 2014, the Dutch government introduced new laws which provide a “traffic light” system for breeding of dogs. Meeting this requirement would allow for incremental improvement over successive generations. The Dutch rules should be adopted by Australian Breed Societies, and the Australian government should consider making this scheme mandatory under legislation.

2) Screening for vertebral body abnormalities: Reliable screening for vertebral body abnormalities should be established and affected individuals must not be bred or shown. Vertebral body abnormalities have been shown to have a very high degree of heritability in all breeds, with a proven genetic link in French Bulldogs, English Bulldogs and Boston Terriers. Research has found the DVL2 frameshift mutation is associated with the presence of a "screw tail" in French Bulldogs, British Bulldogs and Boston Terriers. The DVL2 variant segregates in a recessive manner with caudal vertebral malformations. It also has incomplete and variable penetrance for thoracic vertebral malformations. Screening for the DVL2 gene is commercially available through Orivet. All French Bulldogs, British Bulldogs and Boston Terriers should be screened for the DVL2 gene and should not be bred from if positive. To screen for thoracic vertebral malformation, ccomputed topography (CT) is preferred although plain radiographs may suffice. Gutierrez et al described a radiographic classification scheme for congenital vertebral malformations in dogs. Individuals with any vertebral body abnormalities must not be bred. Only dogs found to be free of any vertebral anomalies should be used for breeding purposes or showing.

The Queensland Animal Welfare Standards and Guidelines for Breeding Dogs and their Progeny states that **"***A dog with an exhibited deleterious heritable condition that has the potential to adversely impact on the welfare of the progeny must not be used for breeding, unless with the written approval of a veterinarian or geneticist."*

Breeders must be advised that breeding animals with a known heritable condition is illegal. There is similar legislation in other states

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