**Laryngeal paralysis in Miniature Bull Terriers and Bull Terriers**

Laryngeal Paralysis (LP) is the inability to abduct the arytenoid cartilages during inspiration due to defective function of laryngeal nerves. This results in a partial to complete obstruction of airways and consequent respiratory distress. The clinical signs may vary and may include respiratory murmur, wheezing, cyanosis, voice impairment, extreme breathlessness when exercising, life-threatening episodes of breathing difficulties and suffocation. In some cases, the respiratory difficulties can be fatal.

There are many different forms of LP with different aetiology. Predispositions of various breeds to this disease are influenced by various genetic factors. In Miniature Bull Terriers, a genetic mutation has been identified that presents a major risk factor for early onset of LP.

It is a 36 bp insertion into a coding exon 15 of the RAPGEF6 gene (c.1793\_1794ins36). This mutation leads to the shifting of the reading frame and premature stop codon and results in a loss-of-function allele.

The mode of inheritance of this disease is multifactorial. It means that other genetic factors and/or environmental factors contribute to development of LP. However, the main genetic factor is the recessive allele for the above-mentioned mutation. Dogs that are homozygous for the insertion in the RAPGEF6 gene (they inherit one copy of the defective gene from each parent) have a 10 – to 17-fold increased risk to develop LP.  Heterozygotes inherit the defective gene only from one parent and are clinically normal carriers of the trait but can pass on the risk factor for LP to their offspring.  If two heterozygous dogs are mated, there will be theoretically 25 % of the offspring completely healthy, 50 % will be healthy carriers of the trait and 25 % of the offspring inherit the mutated allele from both parents and the risk for development of laryngeal paralysis will be essentially increased.

**Test**

A test to determine the risk factor has been developed, however it must be understood that this is a risk based test only and not definitive in telling whether your dog will develop early onset LP as anecdotally cases of LP/LP (high risk) dogs have not become symptomatic and cases of N/LP (carrier) have.

The test can be obtained from Laboklin and costs £48\*

The advice from the Kennel Club geneticist is as follows:

“This is not a definitive test; the original research says that homozygotes (affected) have a 10 – 17x the risk of this than other dogs (and that there is no statistically significant increased risk to heterozygotes (carriers). So it is perfectly possible to get an “affected” dog that never gets the condition. It depends what the prevalence is in the wider population. If 5% then a 10 – 17 fold increase gives a 50 – 85% risk; if it is 1% (still quite high), then there is an 83 – 90% change that the “affected” dog won’t get it, and these risk factors depend on the population the research sample was taken from.

This is a risk based test, not a pure single gene mutation test and therefore is of limited value. Risk based tests tend to be more help where a problem is very widespread.”

**The Southern Miniature Bull Terrier Club encourages all our members to health test.**

\*See below

Laboklin now offer (correct as of 28.1.21) a combined DNA bundle which works out value for money.

