UNIVERSITÄT
BERN

April 2019

Genetic risk factor for larynx paralysis (LP)
in Miniature Bull Terriers identified

In the course of a major research effort we successfully identified a genetic risk factor for one form of larynx paralysis (LP) in Miniature Bull Terriers. Our research was supported by many highly motivated owners who donated samples and data of their dogs. Our special thanks go to Sabine and Stefan Heines who alerted us on the increasing number of a heritable form of LP in Miniature Bull Terriers. We also would like to thank many collaborating veterinarians for performing expert endoscopic larynx examinations, which proved essential for our study.

We will attempt to report the dogs' genotyping results to all owners who submitted samples of their dogs prior to the 31st of March 2019. These reports will be sent during April 2019. If you do not receive your result by the 30th of April, you may contact Linda Anderegg to request the result of your dog (linda.anderegg@vetsuisse.unibe.ch).

The identified risk factor for LP has an autosomal recessive mode of inheritance with variable penetrance. Therefore, not every dog with a high risk genotype will actually develop LP. On the other hand, it is also possible that dogs with one of the favourable genotypes nonetheless will become affected by LP. The identified risk factor does not explain all forms of LP. We assume that additional, clinically similar forms of LP exist. These other forms of LP are controlled by so far unknown factors.

Our study enables genetic testing and thus may help to avoid the accidental breeding of puppies with an elevated risk for LP. Genetic testing is currently offered by Laboklin. The University of Bern does not offer genetic testing as a diagnostic service.

Interpretation of genetic test results:

There are two copies of each gene in the genome of a dog. One copy is inherited from the father and one from the mother. The elevated LP risk is inherited in an autosomal recessive manner. A dog will therefore only have an elevated LP risk, if it receives defective gene copies from both the father and the mother. As there is also variable penetrance, not every dog with two copies of the defective gene (= elevated risk for lP) will actually become affected by LP.

Risik factor for larynx paralysis (LP) – autosomal recessive inheritance with variable penetrance		
Genotype: **N/N** (clear – no elevated risk for LP)	Genotype: **N/LP** (Carrier for risk factor)	Genotype: **LP/LP** (elevated risk for LP)
This animal does not carry the genetic defect and has no elevated risk of developing LD. The dog cannot pass the genetic defect to its offspring.	This animal carries one copy of the defective gene. The dog has no elevated risk of developing LP. However, the defect will be passed to its offspring with a probability of 50%. Such an animal should only be mated to a clear animal.	This animal carries two copies of the defective gene and has an elevated risk for LP. Most of these dogs will develop LP during the first years of life.

Carriers have a 50% probability of passing the defective gene copy to their offspring. If two carriers are mated, there is a 25% risk for each offspring to have an elevated risk for LP. Therefore, the mating of two carriers should be strictly avoided. Carriers do not have to be categorically excluded from breeding. However, carriers should only be mated to clear dogs so that no puppies with elevated risk for LP will be born.