

Laryngeal paralysis

What is the larynx and what does it do?

The larynx (voice box, Adam's apple) is a group of cartilages in the back of the throat, that are part of the respiratory system. When we breathe, air enters via the nose or mouth and passes into the back of the throat, called the pharynx. The mouth and pharynx form part of both the respiratory (breathing) and gastrointestinal (food) systems. The pharynx leads to the rest of the respiratory system via the larynx and to the rest of the gastrointestinal system via the oesophagus. The larynx is a group of cartilages that can be felt in the top of the neck, just behind the jaw, that lead into the trachea (windpipe) and then the lungs.

The larynx has multiple functions. It can open wider to allow more air to enter the trachea and lungs, or close to prevent food entering the lungs.

- During normal breathing the larynx will open on inspiration (breathing in), controlled by a single pair of muscles on each side of the larynx - the left and right cricoarytenoideus dorsalis muscles. The amount of movement of the larynx can be adjusted depending on how much air is needed in the lungs.
- Forced closure of the larynx occurs during swallowing and in response to choking episodes.
- Phonation (noise) including barking.

What is laryngeal paralysis and how does it affect dogs?

Laryngeal paralysis is defined as loss of ability to open the larynx. It can occur initially as a single disease or may be a part of a more generalised disease, affecting other parts of the body. It is considered a manifestation of a generalised peripheral polyneuropathy (disease of nerves), called geriatric onset laryngeal paralysis polyneuropathy and is slowly progressive. It is due to disease of either the muscles that open the larynx or the nerves that supply them. In the majority of dogs there is no specific underlying cause of the disease. Occasionally it is seen in cats.

If the larynx can't open, then increased oxygen can't be delivered to the lungs when it is needed. Dogs become more exercise intolerant: they will stop running and eventually only be able to walk for very short periods of time, sometimes just a few minutes. In hot weather or stressful events, the disease can be fatal, due to lack of oxygen and heatstroke. In some cases the owner thinks their dog is just slowing up due to old age or arthritis.

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The disease may also affect the nerves controlling sensation in the pharynx, so dogs cannot easily detect saliva, food or vomit at the back of the throat. Combined with an inability to close the larynx, it puts them at risk of inhaling food and liquids, and can lead to pneumonia.

A small number of dogs may also have reduced nerve function of the oesophagus (tube that carries food from the mouth to the stomach) and they may regurgitate after eating or drinking.

How do I know if my dog has laryngeal paralysis?

Most cases occur in older dogs (average 9 years) large breed dogs. Some breeds are overrepresented (Labrador Retrievers, Golden Retrievers, St Bernards and Irish Setters) but it can occur in any breed, and even in cats.

Clinical signs are slowly progressive over 3-12 months and include:

- Becoming slower on walks, giving the impression of aging. This can be confused with walking slowly due to arthritis. Frequent rests are necessary during the walk.
- Increased noise of breathing – a harsh noise, initially obvious at exercise only. The noise may be fairly quiet initially.
- Changed tone of bark or loss of the bark (silent barking).
- Choking on eating and drinking.
- Coughing, especially after eating and drinking.
- Progression to extreme difficulty breathing and collapse or death, with a blue tongue, typically in warm weather.

Clinical signs are variable between dogs and some dogs may have only one symptom. Dogs have more marked clinical signs between April and September, when the weather is warmer.

Aspiration pneumonia will occasionally develop and dogs become lethargic, inappetant and cough. This requires urgent medical attention.

How will my dog be diagnosed with laryngeal paralysis?

Most dogs are referred when clinical signs are very obvious and we will have a strong suspicion of the disease on clinical examination. It is really helpful to make videos of your dog on a walk to help us make the diagnosis. Videos can be taken on smart phones but

please try make sure your dog can be heard over background noise and try to make videos

of at least 30 seconds long. The disease is confirmed by examining the larynx under anaesthesia. We are able to operate under the same anaesthetic once the diagnosis is made. We may recommend blood tests and chest x-rays to rule out pneumonia or other conditions.

How is laryngeal paralysis treated?

Laryngeal paralysis can only be treated surgically. Surgery is recommended unless clinical signs are very mild and there is still some movement of the larynx. Dogs with laryngeal paralysis are at risk of death from respiratory tract obstruction if the larynx can't open when needed. Dogs also suffer from a worse quality of life if they have difficulty breathing and can't exercise. Although dogs with laryngeal paralysis are usually of middle- to old-age, surgery can be performed at any age and has a low risk of serious complications.

A surgical approach is made on one side of the neck. Stitches are placed into the outside of the larynx to hold one side open and it is commonly known as a 'tieback surgery'. The aim of surgery is to open the larynx wide enough on one side to allow air flow but not so wide as to affect swallowing or allow aspiration of food or saliva. This compromise allows dogs to breathe comfortably in ambient conditions and undergo light exercise. Many dogs can continue to run as well as before they developed the disease.

How do I look after my dog before and after surgery?

If your vet thinks your dog has laryngeal paralysis, they will refer you for a Soft Tissue Surgery consultation. If your dog has a collapse episode prior to referral, your vet will be able to stabilise him/her prior to a routine appointment. Usually this just involves strict rest, anti-inflammatory medication and keeping your dog cool and calm.

Dogs with laryngeal paralysis can be stressed and may have difficulty breathing; however, most cope well with a trip to the vets. We will usually see you and your dog for a consultation on one day and then ask you to return early one morning, normally the following day, so that surgery can be done as a day case where possible. We have found that dogs with laryngeal paralysis cope best with having day-case surgery rather than staying in hospital the night before. Most dogs are ready to return home by the afternoon or early evening after surgery.

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We will provide you with written instructions for post-operative care but to prepare you might wish to have the following available:

- A harness, as there will be a wound on the neck.
- Tinned food that can be formed into meatballs, or hard biscuits. You might need to hand feed for a few days or weeks. Avoid sloppy food particularly milk or gravy, as it is more likely to be aspirated.
- Ice cubes in case of choking when drinking, and sometimes cold water is swallowed more easily than room temperature water when the throat is a bit sore.
- You must remember that your dog must not swim again after tieback surgery as they will be unable to protect the airway if they put their head underwater. Hydrotherapy can be resumed in some cases after discussion with the hydrotherapist.

After surgery, 90% of dog owners report improved quality of life. You may continue to hear the abnormal breathing noise and coughing may continue intermittently, but you should notice that your dog is happier. The main complication rate after surgery is pneumonia and if your dog is coughing after this surgery, you should remind any vet you see that your dog has had this surgery. In most dogs pneumonia can be managed with a course of antibiotics, but if your dog is severely affected, treatment may involve hospitalisation for oxygen or intravenous fluids and antibiotics.

Laryngeal tieback surgery provides a dramatic improvement in quality of life for those dogs where it is their only medical problem. However nearly all of the cases that are referred to us for laryngeal paralysis and are likely to have other medical problems that might need investigation or treatment, so sometimes the improvement is moderate, but you should still remember that it is distressing being unable to breathe and improving your dog's airway will still make him/her feel a lot better about life.

Anderson Moores Veterinary Specialists February 2018

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