

Brachycephalic Airway Syndrome

What is brachycephalic airway syndrome?

Brachycephalic dogs have a compressed, shortened skull and a characteristic "smushed nose" appearance. Common brachycephalic breeds include English and French bulldogs, Pekingese, Boxers, Boston terriers, pugs, and Shih Tzus. Because of their abnormal skull conformation, these dogs are prone to a number of upper respiratory problems affecting the nose, mouth, and throat. Together, these problems are referred to as "brachycephalic airway syndrome."

There are three primary physical abnormalities that comprise brachycephalic airway syndrome, although each individual dog will be affected to a different varying degree. The three primary issues are:

1. Stenotic nares are nostrils that are excessively narrow, due to a congenital (birth) defect of nose cartilage. Air cannot flow smoothly through narrow nostrils, so increased respiratory effort and noisy breathing result.

2. An "elongated soft palate" refers to the soft structure at the back of the roof of the mouth, after the hard palate. In brachycephalic dogs, the soft palate is longer than normal and hangs down into the back of the throat. This elongation interferes with airflow into the windpipe (the trachea), resulting in labored breathing.

3. Finally, the turbulent flow of air down the trachea can cause inflammation of tissue by the voicebox (the larynx). These tissues can become so swollen that they protrude into the main airway, and they are then known as "everted laryngeal sacculles."

In addition to these primary abnormalities, brachycephalic dogs may also have several secondary airway problems. If left untreated, the primary components will result in continued swelling and inflammation of all upper airway structures. The cartilage that supports the larynx may become weakened, eventually causing the larynx to collapse. Similarly, the trachea may lose its structural support, making breathing more difficult and causing a chronic cough to develop.

What are the symptoms of brachycephalic airway syndrome?

Symptoms of brachycephalic airway syndrome may be mild, or may eventually become so severe that life-threatening respiratory distress develops. Common symptoms include snorting, noisy breathing, excessive panting and exercise intolerance. Heat, stress, or excitement can often make symptoms dramatically worse. Some dogs have so much difficulty breathing that they are unable to sleep for long periods of time ("restless sleepers"). Dogs who are severely affected may occasionally turn blue and pass out from lack of oxygen; death can eventually result. Although these airway problems are usually apparent from a young age, most dogs are 2 to 4 years of age before they are brought to a veterinarian for evaluation and treatment.

What tests are needed?

All prospective patients should have chest radiographs ("x-rays") taken prior to surgery, to eliminate the possibility of underlying heart or lung disease. In addition, a comprehensive oral and upper airway exam (larynx, trachea) under heavy sedation or light anesthesia is indicated to clarify the extent of the problem and help with treatment planning.

What treatment is needed?

Fortunately, the three primary components of brachycephalic airway syndrome can be corrected surgically, usually with good to excellent results. The stenotic nostrils can be widened so that air can flow easily into the nasal cavity. The elongated soft palate can be trimmed to an appropriate length so that it will no longer interfere with normal air flow into the trachea. Everted laryngeal sacculles can be removed, thus clearing the main airway.

Although each of these surgical procedures is relatively brief, they should be performed by an experienced veterinary surgeon. Serious complications can develop if they are performed incorrectly. The surgeon should also have considerable experience anesthetizing brachycephalic breeds. It is a common misconception among dog owners that brachycephalic breeds do not tolerate anesthesia well. In fact, these dogs generally do quite well while under anesthesia; it is the recovery ("waking up") from anesthesia that can cause a problem. Dogs with brachycephalic airway syndrome typically have very swollen, narrow airway structures. Surgical manipulation of these structures can worsen the swelling, making breathing difficult in the immediate post-operative period. Steroids may be given to help reduce inflammation, and oxygen support should be available if needed. After surgery, all dogs should spend a minimum of one night in a hospital with 24-hour supervision so that respiratory rate and effort can be closely monitored. In occasional cases, a temporary tracheostomy tube (a tube that is inserted into the main windpipe through an incision in the throat) may need to be placed until airway swelling resolves sufficiently. Again, serious complications can occur, so experienced veterinary supervision is an absolute requirement.

What is the prognosis?

Although the prognosis is optimistic if affected dogs have surgical treatment while still young (preferably less than 4 years of age), the outcome becomes more guarded in older dogs. Chronic secondary airway problems, such as a collapsing larynx, cannot be corrected surgically, so affected dogs will continue to have respiratory difficulty. Keeping dogs at a good body weight and avoiding stressful situations may help, but these measures will never fully compensate for the underlying airway problems. In severe cases, a permanent tracheostomy may be required to prevent life-threatening respiratory distress. Since dogs respond well to early surgical intervention, owners of brachycephalic breeds should have their dogs examined by a veterinary internist or surgeon as soon as possible if noisy breathing or other respiratory abnormalities are noticed.

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