

### What is Brachycephalic Airway Syndrome

The term brachycephalic refers to breeds such as Pug, Boston Terrier, English Bulldog, French Bulldog, among to the most common ones with pushed in, short faces. Many dogs with this appearance suffer from brachycephalic airway syndrome (BAS), a term that denotes upper airway obstruction attributable to a combination of anatomic abnormalities affecting different areas of the respiratory system. The most common components of this syndrome are:

1. **Stenotic Nares:** This is a fancy name for narrowed nostrils (Fig. 1). Airflow into the nasal cavity is restricted and greater inspiratory effort is necessary, causing mild to severe breathing difficulties. If the narrowing is severe, surgical correction is indicated.



Fig. 1. (A): Stenotic nares; (B): Normal nares.

2. **Elongated Soft Palate:** The soft palate, which separates the nasal passage from oral cavity, is long and flaps loosely down into the throat, creating snoring sounds. This further narrows the airway passage but it can be surgically trimmed. (Fig. 2)



Fig. 2. (A) Elongated soft palate obstructing airway passage at the level of the throat (larynx); (B) Throat and specifically the larynx is completely visible after soft palate surgical trimming, allowing clear air passage.

3. **Laryngeal Sacculae Eversion:** Soft tissue swelling at the level of the throat. The sacculae should be surgically removed as their presence causes great narrowing of the airway passages and indicates severe disease. (Fig. 3)

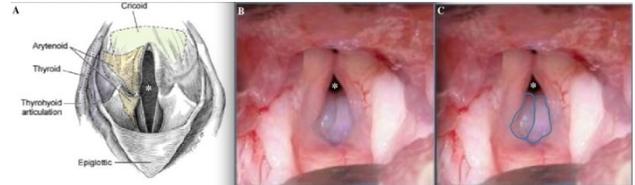


Fig. 3. (A): Schematic of a normal canine larynx (source Fossum TW: Small Animal Surgery); (B): Picture of a canine larynx with presence of everted sacculae obstructing the airway passage; (C): Everted sacculae highlighted with blue line. \* marks the airway passage at the level of the throat.

### Signs and Symptoms

- Noisy breathing with varying levels of respiratory difficulty
- Bluish discoloration of gums (Cyanosis)
- Panting even in a cool and quiet location
- Exercise intolerance
- Restless sleep
- Gastrointestinal signs: retching or gagging, vomiting, trouble eating and excessive salivation
- Collapse
- Stress, excitement and increased heat and humidity frequently make clinical signs worse.

### Diagnosis

Diagnosis starts with a detailed physical examination of your pet. Stenotic nares and a characteristic breathing pattern can be easily recognized in patients affected by BAS. Chest radiographs are taken to look for concurrent diseases. Complete blood count and chemistry are also important to evaluate overall health. Next step is a sedated laryngeal examination. This allow us to evaluate the size of the soft palate and presence of everted sacculae, as well as normal movement of the laryngeal cartilages and other possible causes of upper airway obstruction such as a mass.

### When Surgery is Indicated

Brachycephalic syndrome can be addressed as soon as your pet is old enough to be safely anesthetized (around 6 months). The most common BAS components (stenotic nares, elongated soft palate and everted sacculles), when presented together, can be surgically addressed at the same time, under one anesthetic episode.

### Consultation and Surgery Scheduling

It is important to start with a surgical consultation for a full evaluation of your pet. We will discuss BAS in detail, review concurrent diseases and evaluate your pet for any complicating factors. We will also carefully discuss the postoperative care. We can perform surgery on the same day of the consultation in most cases and can move from laryngeal examination to surgery in one anesthetic episode.

Emergency surgery is also available if indicated.

### Surgical Technique

Rhinoplasty is the surgical method to permanently widen the external nares (Fig. 4). Staphylectomy is the medical term used to describe trimming of the soft palate (Fig. 2). It is all done at the level of the throat, inside of the mouth, and with sutures that will be absorbed after the healing is achieved. Resection of the everted laryngeal sacculles is done, if necessary, following the palate surgical trimming.

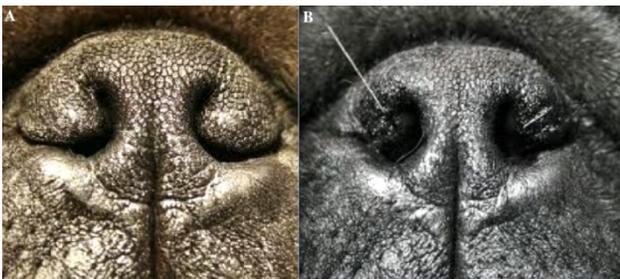


Fig. 4. (A): Stenotic nares; (B): Nares after rhinoplasty.

### Recovery and Prognosis

Swelling of the operated sites can promote narrowing of the airway and severe respiratory difficulties. For this reason, patients are closely monitored during anesthesia recovery and through the first 24 hours after surgery. We have a veterinarian monitoring our patients 24 hours a day. It is important that patients are kept calm and in a cool environment for 2 weeks after surgery to avoid excessive excitement, panting and barking, and prevent inflammation of the operated sites.

After 2 weeks of rest, your pet can gradually return to normal activity. Surgical correction of brachycephalic syndrome will alleviate signs of respiratory distress and improve quality of life.