BRACHYCEPHALIC UPPER AIRWAY SYNDROME

Brachycephalic (short-faced) breeds of animals, such as Pugs, English and French Bulldogs, Boston Terriers, Persians, etc., can have certain anatomic abnormalities that can cause respiratory difficulties. Collectively, these abnormalities are known as Brachycephalic Upper Airway Syndrome (BUAS). Classically the syndrome consists of four components (not that all individuals necessarily have all four components):

1. **Stenotic nares**: This is when the nostril openings are too small for the animal.
2. **Elongated soft palate**: The soft palate is the rear portion of the roof of the mouth that does not have any bone underneath it. Nearly all brachycephalic animals have an elongated soft palate. However, it is not always clinically significant. When it is a clinical problem, the excessive palate tissue causes some degree of obstruction in the upper airway.
3. **Everted laryngeal saccules**: Laryngeal saccules are two outpouchings of tissue that are located in the larynx (voicebox). Of the four components, this is the only one that is an acquired condition. The saccules normally are positioned away from the airway opening. However, with the vacuum associated with increased respiratory effort, the saccules can be pulled into the airway (evert), causing even more obstruction in the upper airway.
4. **Hypoplastic trachea**: This is when the animal has a windpipe that is too small for its size.

**What are the symptoms?** Most animals with BUAS present for respiratory signs, such as increased respiratory noise and effort. In severe cases, the animal may have had an episode of respiratory distress or may have even lost consciousness. Some individuals also present for some degree of coughing and gagging. Increased exercise or hot conditions often worsen clinical signs.

**What diagnostic tests need to be performed prior to surgery?** Most patients have blood tests to check for any other major health conditions that may increase the risks of an anesthetic procedure. Chest X-rays are obtained to determine if the animal has a hypoplastic trachea, as well as to check for any abnormalities in the lungs. When anesthetized, a thorough upper airway examination is performed in order to assess the nature and severity of the animal’s anatomical abnormalities. Once this is determined, surgical correction is performed if deemed necessary.

**What are the surgical treatments for BUAS?** The surgical goal for a patient with BUAS is to remove any tissue that is causing upper airway obstruction.

Stenotic nares (Fig. 1 below) are corrected using a wedge resection technique, which means that a small wedge of tissue is removed from the nare. The surgeon then brings the two tissue edges together, thus functionally widening the nasal opening. This is usually performed with a scalpel blade, but may be performed with the laser in cats and in very small dogs.

In the case of an elongated soft palate (Fig. 2 below), the excess tissue is excised (removed surgically). Most surgeons will choose to use a laser for this procedure if there is one available. The laser allows quick removal of the tissue and minimizes both swelling and hemorrhage. This is important to help diminish post-operative complications that may arise.
If present, everted laryngeal saccules (Fig. 3 below) are also excised. Again, the laser is helpful for this procedure.

Unfortunately, there is no surgical procedure to correct for a hypoplastic trachea.

![Fig 1: Stenotic nares](Courtesy: Slatter, Textbook of Small Animal Surgery)
![Fig 2: Everted saccules](Courtesy: www.marlato.com)
![Fig 3: Elongated Soft Palate](Courtesy: www.acvs.org)

**What is the prognosis?** If corrected early, most animals with BUAS have a good prognosis. However, if the condition is left uncorrected, the animal may have some degree of laryngeal collapse. In this condition, the cartilages that make up the larynx (voice box) lose their rigidity and become distorted, causing obstruction of the airway. Even with correction of their BUAS components, animals with laryngeal collapse can have a variable prognosis for recovery, depending on their degree of cartilage distortion.

**What will the recovery period be like?** Following surgery, most animals will generally stay one to two nights for observation, to ensure that they are breathing well and pain is well-managed. Once home, two weeks of activity restriction (no running or jumping) will be recommended. Feeding a soft food during this time will help decrease throat pain and inflammation. The animal may have a mild cough as the irritation from the surgery diminishes. Full recovery may take six to eight weeks.

**What are the possible complications of this type of surgery?** Post-operatively, respiratory obstruction due to tissue inflammation and/or hemorrhage is possible. With the advent of the use of the laser, this is uncommon but still possible.

As with any surgery, there is an anesthetic risk. Anesthetic complications are rare, however, and risk is minimized by our use of the best practices in anesthesia choice and extensive monitoring of your pet by our surgeons, licensed veterinary technicians, and advanced monitoring equipment.