

## BASIC INFORMATION

### Description

Brachycephalic syndrome occurs when anatomic and acquired abnormalities of one or several structures located in the upper respiratory tract result in partial airway obstruction. The abnormalities make it difficult for the animal to take in air, and progressive breathing problems develop. The syndrome affects primarily the flat-faced, short-nosed breeds of dogs (brachycephalics), which explains its name. Commonly affected breeds include the English bulldog, French bulldog, Boston terrier, pug, Pekingese, shih tzu, boxer, and occasionally other breeds. Rarely, it occurs in brachycephalic cats, such as the Himalayan and the Persian.

### Causes

Signs of upper airway obstruction arise from one or a combination of the following conditions:

- Small openings of the nostrils (stenotic nares)
- Elongation of the soft palate
- Eversion or prolapse of laryngeal sacculles of the voice box into the tracheal airway
- Underdeveloped, narrowed trachea (primarily in the English bulldog)
- Excessive soft tissue within the throat area that obstructs the airway

Enlarged and inflamed tonsils sometimes contribute to airway obstruction.

### Clinical Signs

Because breathing is affected, increased noises are heard from the nose and throat, usually on inspiration (breathing in). Many dogs gag or cough, and some occasionally vomit. Panting is common. When the animal is relaxed or sleeping, loud snoring often occurs.

Some dogs have so much trouble breathing that their tongues and gums turn blue and they become overheated. Engaging in any exercise can cause the dog to collapse. Many affected dogs are obese.

### Diagnostic Tests

The presence of these clinical signs in a short-faced breed may allow a tentative diagnosis. Checking for an elongated soft palate, everted sacculles, collapse of the larynx, or other problems involving the larynx (such as laryngeal paralysis or the presence of a mass obstructing the opening of the larynx) can be done accurately only with the animal under heavy sedation or briefly anesthetized. Other abnormalities may be diagnosed during an oral examination.

X-rays of the chest help define any additional problems of the trachea (narrowed diameter, collapse) or lungs, as well as the presence of a hiatal hernia, which can accompany this airway problem.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Emergency therapy may be necessary in a severely compromised animal. Sedation, oxygen therapy, lowering of the body temperature (if the animal is overheated) may all be needed, and possibly a temporary tracheostomy until corrective surgery can be done.

Conservative management in nonemergency cases includes weight loss, exercise restriction, and avoiding situations that may precipitate the respiratory problems (such as excitement or exposure to increased ambient temperatures). Conservative management must usually be followed (in a timely fashion) by surgical correction of the abnormalities to prevent worsening of the problem and development of secondary changes such as collapse of the larynx. In some dogs, esophageal problems, such as hiatal hernia, also require treatment.

Shortening of the soft palate, widening of the nasal openings, and correction of secondary changes in the laryngeal area are done ideally while the animal is young (6-18 months of age) to ensure a better outcome and to prevent any catastrophic respiratory event. Steroids may be given prior to surgery to prevent excessive swelling of the tissues in the throat after surgery. Other drugs may be given to prevent aspiration pneumonia postoperatively.

In high-risk patients (especially English bulldogs), a temporary tracheostomy may be done at the time of surgery and left in place for 24-48 hours postoperatively. This allows time for postoperative swelling to resolve and the airway opening to enlarge. If moderate to severe laryngeal collapse is present, a permanent tracheostomy that bypasses the larynx and provides a permanent opening in the trachea (windpipe) may be necessary.

### Follow-up Care

After surgery, very close monitoring is required. Aspiration pneumonia is a serious problem that can occur, and x-rays may be recommended to monitor for this condition. Gagging and coughing are common after surgery and may last for several days. Food is generally withheld for at least 18-24 hours after surgery. Water intake is unrestricted.

### Prognosis

Prognosis without surgery is poor, because respiratory distress often worsens over time and may become life-threatening. Most dogs recover from surgery with immediate improvement in their respiratory signs.