

BRACHYCEPHALIC SYNDROME. COMPARISON BETWEEN CONVENTIONAL SURGICAL TECHNIQUES, RESECTION WITH SURGICAL LASER AND PLASTY. ADVANTAGES AND DISADVANTAGES OF EACH.

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1. INTRODUCTION

Brachycephalic syndrome (BS) is a common finding in small animal practice due to the increasing popularity of the affected breeds. The syndrome includes primary anatomical components based on typical breeding standard with their corresponding secondary sequelae that compromise the quality of life of these animals¹.

2. OBJECTIVES

- ◆ To make a literature review of BS' most remarkable aspects.
- ◆ To detail the diagnostic methods and treatment (mainly surgical) applicable to BS.
- ◆ To describe surgical techniques used to solve BS' components: stenotic nares, elongated soft palate and everted tonsils; paying special attention to advantages and disadvantages of each technique.
- ◆ Review the existent literature about new developments on BS.

3. BRACHYCEPHALIC SYNDROME

3.1. Epidemiology

Dog breeds most commonly affected are English and French bulldogs, Pugs, Boston terriers, Pekingese, Shih tzu, Maltese, Cavalier King Charles Spaniels, Boxers, Yorkshire terriers, Pinschers miniature, Dogue de Bordeaux and Bullmastiffs^{1,2,3}. Brachycephalic cat breeds include Himalayan and Persian¹. BS' components can be present at birth but may not be pathological until the animal has two or three years old^{1,3}. There is no gender predisposition^{1,3} although some studies show higher incidence (2:1) in male dogs.



3.2. Anatomical abnormalities

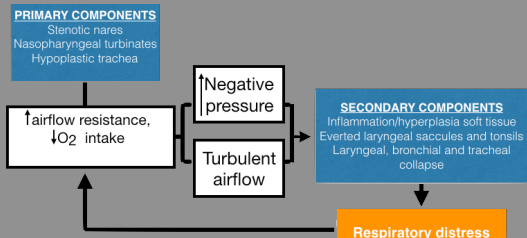
BS is a combination of anatomical abnormalities that result in a reduction of skull length not accompanied by a proportional reduction of the oral cavity soft tissues and can be classified into primary or secondary¹. Primary components include: stenotic nares, elongated soft palate, nasopharyngeal turbinates and hypoplastic trachea¹. Secondary components are: everted laryngeal saccules, laryngeal collapse, bronchial collapse and everted tonsils^{1,4}.

Studies/Primary component	Stenotic nares	Elongated soft palate	Everted laryngeal saccules	Laryngeal collapse	Everted tonsils
Poncet <i>et al.</i> , 2005	84.9% (62/73)	95.9% (70/73)	54.8% (40/73)	69.9% (51/73)	-
Poncet <i>et al.</i> , 2006	85.2% (52/61)	100% (61/61)	54.1% (33/61)	63.9% (39/61)	-
Torrez y Hunt, 2006	42.5% (31/73)	86.3% (63/73)	58.9% (43/73)	53.1% (34/64)	-
Riecks <i>et al.</i> , 2007	58.1% (36/62)	87.1% (54/62)	58.1% (36/62)	8.1% (5/62)	-
Fasanella <i>et al.</i> , 2010	77% (69/90)	94% (85/90)	66% (59/90)	-	56% (50/90)

Table 1. Impact on different BS components shown by different studies. The percentage and, in brackets, the number of dogs that manifest the condition over the total included in the study.

3.3. Pathophysiology

The pathophysiology of BS is explained, first of all, by anatomical abnormalities and secondly, by the result of changes in airflow and air pressure in the upper airways.



3.4. Clinical signs

Most common clinical signs include: stertor, stridor, snoring, coughing, increased respiratory effort, hyperthermia, collapse, cyanosis and syncope². The disease has different degrees that may be worsened by obesity or stressful situations such as heat, excitement or exercise¹. Gastrointestinal signs (p.e. vomiting, regurgitation, ptyalism and dysphagia) are also common and are thought to be the result of a high positive abdominal pressure^{1,4}.

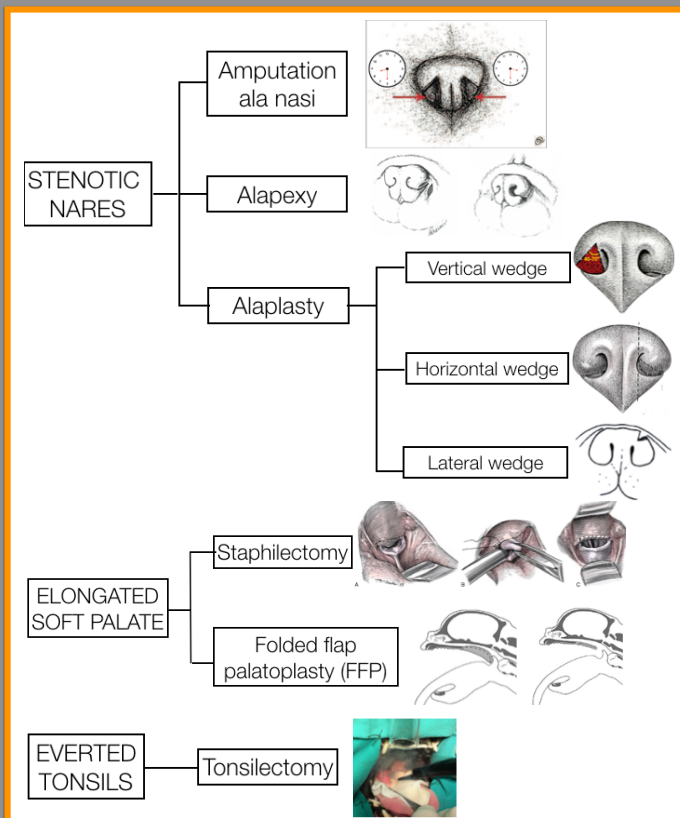
4. DIAGNOSIS

Diagnosis is usually based on owners' reports, clinical examination and diagnostic imaging. Radiographic, fluoroscopic, CT, and endoscopic studies all contribute to the evaluation of the static and dynamic obstruction of the respiratory tract².

5. MEDICAL TREATMENT

- ◆ Minimize stress → sedation^{2,5}.
- ◆ Keep confort temperature and oxigenation^{2,5}.
- ◆ Inflammation of soft tissues → GCC at antiinflammatory doses^{2,3,5}.
- ◆ Gastrointestinal signs → prokinetics, antacids, proton-pump inhibitors and gastric mucosal protectors⁴.

6. SURGICAL TREATMENT



TECHNIQUE	Advantages	Disadvantges
Amputation	Less difficult and surgical time ⁶ . Easier in immature animals ⁴ .	Depigmentation. Bleeding ⁴ . Less resected tissue ⁴ .
Alapexy	Used when ala nasi is too flabby or alaplasty technique fails. The aperture of nares not depend on ala nasi flacidity so the long-term fail is less frequent.	More surgical time.
Alaplasty	Less surgical time, less incisional bleeding and lees post-op care when using laser.	Asimetry. Depigmentation. Vertical technique may recur if flacidity of the cartilage is present. May fail because of increased mobility of the dorsolateral cartilage.
Staphilectomy (CO₂ laser)	Less surgical and post-op time. Less bleeding, hemorrhage, inflammation, edema and pain. Promotes healing.	High cost and security risks for staff.
FFP	Post-op edema may develop in a farther area of the pharynx so it will supose less risk at discharge.	If the excess of tissue is not removed totally, the animal may continue showing respiratory signs.
Tonsilectomy	Less surgical time and bleeding using CO ₂ laser and bipolar sealing device.	Hemorrhage.

7. FUTURE AND CONCLUSIONS

The definitive treatment for the BS is always surgical. Early intervention can slow down the progression of the signs and complications. There are several surgical techniques and, during the last years, the use of CO₂ laser ensures less surgical time, bleeding, swelling and intra- and postoperative pain, as well as a more precise tissue resection. A possible explanation for the poor therapeutic success after conventional surgeries, could be the lack of consideration in the diagnosis, management and treatment of the rest of intranasal structures. To understand the BS, all the efforts should relapse into the selection of these breeds, so that in the future, the objective is to encourage more moderate craniofacial morphologies in order to reduce the prevalence and severity of BS.

8. REFERENCES

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