

Brachycephalics and Beyond

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Respiratory diseases as well as respiratory distress are common complaints in dogs. Due to unique breed characteristics, including anatomic features, there is a breed predilection for many conditions. As in all aspects of veterinary medicine, breed characteristics are remarkably useful in the initial generation of a differential list and diagnostic plan. This review will focus on unique respiratory conditions that are over-represented in specific breeds. As with all respiratory diseases, localization of the source of the disease is essential for appropriate diagnostics and while these are common conditions, the clinician should keep an open mind and evaluate each patient individually and avoid tunnel vision.

Upper airway obstruction

Upper airway obstruction is a common and occasionally under-recognized source of respiratory distress. As an overview, dogs with upper airway obstruction will have noisy breathing that worsens with exercise or heat exposure. Normal inspiration results in negative pressure inside the upper airways, which causes collapse of weaker or less supported tissues. Recurrent obstruction contributes to tissue swelling and edema, which further magnifies obstruction. Heat stress, which leads to panting, is associated with higher inspiratory flow rate, which may require more work of breathing due to partial airway obstruction, which results in more muscle activity and paradoxically further overheating. Specific upper airway disease includes brachycephalic obstructive airway syndrome (BAS), and laryngeal paralysis. Rhinitis may also contribute to airway obstruction, as dogs are preferential nasal breathers, particularly at rest.

Bulldog

All bulldogs have some component of BAS. Classic features include stenotic nares, long/thick soft palate, everted laryngeal sacculles, tracheal hypoplasia, and in some dogs laryngeal collapse or nasopharyngeal turbinates.(1,2) Pharyngeal edema and collapse may also occur with prolonged obstruction. Figure 1 and 2 show the relative upper airway confirmation of a brachycephalic dog and a dog with a normal skull anatomy (mesocephalic).

Treatment of bulldogs includes early conversation with the owners of bulldogs, and consideration for surgical palliation with soft palate resection and/or stenotic nares resection. (2) Many owners assume exercise intolerance and stertorous breathing are normal, and may be reassured that surgery will typically result in marked improvement in quality of life, particularly if performed early in life. Long-standing obstruction will result in increased pharyngeal soft tissue weakness, and may potentially result in less improvement after palliative surgery than if done earlier in life. Surgical palliation may be successfully performed in practice by the interested clinician or by a surgeon, either using a laser or hand-suturing techniques. (2)

Bulldogs are also prone to heat stress due to their inability to effectively cool and also are prone to gastrointestinal distress and esophageal dysfunction. GI distress may be reflective of aerophagia and intermittent hiatal hernias.(3,4) Chronic therapy with a proton pump inhibitor,

such as omeprazole (1 mg/kg or 20 mg/bulldog) may be helpful and can be considered in all bulldogs. Avoidance of obesity is also useful with many bulldogs benefitting from specific veterinary diet input to avoid maintaining extra weight.

Norwich terrier

Norwich terriers are a less common but very personable terrier. (Figure 3) Norwich terriers have been identified with an upper airway syndrome, despite not being a brachycephalic breed. (5) Specifically, airway abnormalities include redundant supra-arytenoid folds, laryngeal collapse, everted laryngeal sacculles, and a narrowed laryngeal opening. Laryngeal abnormalities have been noted in dogs without apparent clinical signs as well. Response to surgical intervention in treated dogs was minimal to moderate in treated dogs with less of an improvement than seen in other upper airway obstructions.

It is wise to be familiar with the idea that Norwich terriers get upper respiratory diseases, because they are uncommon dogs with an active and knowledgeable breed club. Breeders are uniquely familiar with this respiratory condition and expect the same from their veterinarian. Surgical lateralization may be inadequate to maintain laryngeal lumen. Importantly, as not all dogs have apparent clinical signs, anesthesia should be performed with caution and careful monitoring due the potential for a smaller than normal laryngeal lumen.

Summary of Diagnostic techniques- A complete medical history and physical examination should be performed prior to diagnostics in all breeds of dogs. The location of disease or suspected disease should be established. For diagnostic testing that requires anesthesia or sedation, if possible, it is prudent to combine surgical or other palliative therapy with those diagnostics and avoid the “wake up and make plan”, especially for patients with compromised upper airways.

The major diagnostic testing options available

- 1) Thoracic radiographs- Radiographs are most helpful for dogs with suspected lower airway disease (eosinophilic bronchitis), pneumonia and pulmonary fibrosis as diagnostic tools, but are useful to exclude pulmonary disease in Norwich terriers, to evaluate for concurrent pneumonia or megaesophagus in laryngeal paralysis, and pneumonia or hiatal hernia in bulldogs.
- 2) Computed tomography – Primary use is identification of pulmonary fibrosis. A lung biopsy is definitive, but less commonly performed due to costs, potential risks and current lack of therapeutic options.
- 3) Oral examination- Most useful in dogs with upper airway disease; Doxapram (1-2 mg/kg IV) may be useful to identify any dynamic collapse.
- 4) Bronchoscopy- Useful in tracheal collapse
- 5) Airway cytology and culture- Useful for eosinophilic disease and excluding or establishing bacterial infections. Recall that colonization is common in the lower airways and a positive culture does not necessarily indicate infection.

References

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