

Nebulization in Brachycephalic Patients

Jacob Rubin, DVM, DACVS-SA
 Maine Veterinary Medical Center
 Scarborough, Maine

In the literature

Franklin PH, Liu N-C, Ladlow JF. Nebulization of epinephrine to reduce the severity of brachycephalic obstructive airway syndrome in dogs. *Vet Surg.* 2021;50(1):62-70.

FROM THE PAGE ...

Brachycephalic obstructive airway syndrome (BOAS) commonly affects brachycephalic breeds and is increasing in prevalence due to the popularity of these breeds. Treatment that reduces the severity of clinical signs—combined with either surgical or breeding practices—can help minimize postoperative complications. Early intervention and correction of BOAS abnormalities are recommended for the decrease or prevention of airway pathology progression. Nebulized epinephrine has been used in humans and is hypothesized to cause vasoconstriction of vessels in the upper airway mucosa via action on α -adrenergic receptors, with minimal systemic adverse effects.^{1,2}

Complications associated with airway surgery can include aspiration pneumonia, postanesthetic swelling and obstruction, and even death. The reported mortality rate associated with BOAS ranges from 2.5% to 4%.^{3,4}

This prospective, controlled clinical study evaluated the use of nebulized epinephrine to reduce mucosal edema. Dogs ($n = 31$) were evaluated with whole-body plethysmography before and after nebulization; a smaller subset ($n = 13$) was evaluated after surgical treatment of the airway. Nebulization was achieved via epinephrine (0.05 mg/kg) diluted in normal saline. On nebulization, there

was a decrease in the brachycephalic index for preoperative and postoperative patients by 9.6% and 14.3%, respectively. Minimal adverse effects were noted, with only 4 post-surgical patients displaying regurgitation and/or lip-smacking; however, it is unclear whether these are adverse effects of epinephrine or anesthesia in brachycephalic patients.

This subject is important to help improve brachycephalic surgery outcomes.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** Appropriate pet owner education is necessary before brachycephalic patients are anesthetized and surgery is performed.
- 2** Nebulized epinephrine—when combined with appropriate anesthetic management and monitoring—can be a cost-effective and safe way to potentially minimize complications in brachycephalic patients.
- 3** Management of regurgitation should be attempted, if medically possible, before brachycephalic surgery is performed.

References

1. Ellis J, Leece EA. Nebulized adrenaline in the postoperative management of brachycephalic obstructive airway syndrome in a pug. *J Am Anim Hosp Assoc.* 2017;53(2):107-110.
2. Smith DK, McDermott AJ, Sullivan JF. Croup: diagnosis and management. *Am Fam Physician.* 2018;97(9):575-580.
3. Lindsay B, Cook D, Wetzel J-M, Siess S, Moses P. Brachycephalic airway syndrome: management of post-operative respiratory complications in 248 dogs. *Aust Vet J.* 2020;98(5):173-180.
4. Poncet CM, Dupre GP, Freiche VG, Bouvy BM. Long-term results of upper respiratory syndrome surgery and gastrointestinal tract medical treatment in 51 brachycephalic dogs. *J Small Anim Pract.* 2006;47(3):137-142.