

Laryngeal & Intratesticular Lidocaine for Feline Anesthetic Techniques

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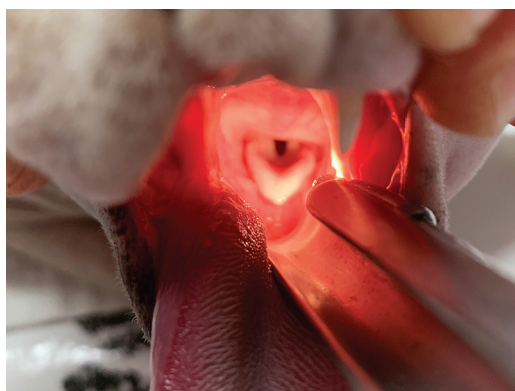
In the Literature

Soltaninejad H, Vesal N. Plasma concentrations of lidocaine following laryngeal administration or laryngeal and intratesticular administration in cats. *Am J Vet Res.* 2018;79(6):614-620.

FROM THE PAGE ...

Use of lidocaine as part of a multimodal analgesic plan in cats is increasing in popularity. For example, topical administration of lidocaine to the larynx is recommended to desensitize laryngeal tissue and facilitate tracheal intubation (**Figure 1**).¹ Similarly, intratesticular administration of lidocaine in cats is used to reduce hemodynamic changes associated with surgical neutering (**Figure 2**).² Although these techniques

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▲ **FIGURE 1** Feline larynx demonstrating the narrow opening of the rima glottidis into the trachea. A laryngoscope (silver, bottom right) is used to depress the caudal aspect of the tongue (bottom left) to visualize the tracheal opening. Lidocaine is commonly applied via syringe to desensitize tissue, facilitating tracheal intubation.



▲ **FIGURE 2** Feline intratesticular block being performed using 2% lidocaine (0.1 mL/kg). Lidocaine is injected into the parenchymal tissue to provide reduced nociceptive signaling during surgical neutering.

are commonly performed, plasma lidocaine concentrations following these procedures are not always considered, even though lidocaine is systemically absorbed and could approach levels associated with toxicity with excessive concentrations or doses. The maximum recommended lidocaine dose in cats is up to 6 mg/kg, with significant toxicity seen at higher intravenous doses (≈ 11 –22 mg/kg).³⁻⁵

This study of 14 cats examined these commonly practiced local anesthetic techniques in a 2-part experiment. In the first part, half of the cats (group L2) were randomly assigned to receive 0.1 mL of 2% lidocaine topically administered on the larynx (≈ 0.6 mg/kg); the remaining cats (group L10) received 0.1 mL of 10% lidocaine topically administered on the larynx (2.8 mg/kg). Plasma lidocaine concentrations were then measured and found to be significantly higher in the L10 group as compared with the L2 group (median maximum plasma lidocaine concentrations, 93.6 ng/mL vs 34.1 ng/mL, respectively).

In the second part of the experiment, cats were randomized to receive topical lidocaine as described for the first part. All cats then received intratesticular administration of 2% lidocaine (0.1 mL) prior to neuter. The concurrent use of topical lidocaine (2% or 10%) with intratesticular administration of 0.1 mL/kg of 2% lidocaine resulted in a maximum total lidocaine dose of approximately 2.54 mg/kg and 4.76 mg/kg, respectively, neither of which exceeds the recommended dose for cats.^{3,4} In addition, the maximum plasma concentrations increased in a dose-dependent manner and were significantly higher than for topical administration alone, although plasma concentrations remained significantly lower than those required to produce seizures in cats.⁴ The time to reach maximum plasma concentrations did not differ among treatments.

It is important to note that factors other than dose and route (eg, patient age, concurrent anesthetics, hypotension, hypothermia) can alter pharmacokinetics and plasma lidocaine concentrations. However, this study suggests that, in adult cats (≈ 8.8 lb [≈ 4 kg]) undergoing surgical neutering, 2% topical lidocaine administered concurrently with intratesticular 2% lidocaine (0.1 mL/kg) results in plasma concentrations unlikely to approach those associated with systemic toxicity. Thus, these techniques can provide useful adjunctive analgesia when neutering cats.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** A previous study has shown topical 2% lidocaine to be as effective as 10% lidocaine for facilitating intubation in cats.¹ Thus, 2% lidocaine, which is associated with lower maximum plasma concentrations, is recommended, and the volume should be adjusted accordingly in smaller patients (eg, young kittens).
- 2** Use of topical lidocaine alone or in combination with intratesticular lidocaine can result in dose-dependent increases in maximal plasma lidocaine concentrations.
- 3** For routine surgical neutering in adult cats, the recommended doses of 2% lidocaine are 0.1 mL (≈ 0.6 mg/kg) administered topically on the larynx and 0.1 mL/kg administered intratesticularly. Doses should be appropriately adjusted for smaller patients.
- 4** Although time to reach peak plasma concentrations does not significantly differ between topical application alone or in combination with intratesticular administration, plasma concentrations may be affected by other patient factors and should be considered on an individual patient basis.

References

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