Airway Anesthesia
Theory and Practice

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KEYWORDS

• Airway anesthesia • Airway blocks • Awake intubation • Benzocaine toxicity
• Fiber optic intubation • Lidocaine toxicity • Local anesthesia • Topical anesthesia

KEY POINTS

- Lidocaine is available as a regular solution, a viscous solution, a gel, an ointment, or in a spray can.
- Topicalization is the easiest method for anesthetizing the airway; just spray lidocaine directly onto airway mucosa.
- Needle-based airway blocks are more complicated than noninvasive methods of providing anesthesia to the airway and are usually unnecessary to achieve good airway anesthesia.
- Benzocaine topical anesthesia, although highly effective, is sometimes complicated by methemoglobinemia, the presence of elevated methemoglobin levels within circulating erythrocytes.
- Local anesthetic toxicity with lidocaine, the most commonly used drug for airway anesthesia, can range from tingling, perioral numbness, and paraesthesias to convulsions, coma, and complete cardiorespiratory collapse.

INTRODUCTION

Awake tracheal intubation is commonly used when ordinary intubation (for example, attempting direct laryngoscopy after the induction of general anesthesia) is expected to be difficult or hazardous.[1–8] Possible examples include patients with large glottic tumors, patients with unstable cervical spines, patients known to be difficult to intubate by virtue of previous anesthetic misadventures, and numerous other conditions.[9–15]

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Regardless of the reason that awake intubation is warranted, however, several underlying principles hold. First, although sedation using drugs such as midazolam, fentanyl, propofol, remifentanil, and dexmedetomidine are undoubtedly useful adjuncts to performing an awake intubation, the "secret recipe" is undoubtedly in obtaining complete anesthesia to the airway structures. With good airway anesthesia, minimal or even no sedation at all can be used, and patient cooperation is much easier to achieve. The purpose of this article is to help make this happen.

MOLECULAR MECHANISMS OF ANESTHESIA

The mechanism by which local anesthetics work has long interested clinicians, and it is customary to comment on this matter in all articles dealing with local anesthesia. Key to this matter is the molecular arrangement common to all local anesthetics (**Fig. 1**).

Until recently, the conventional wisdom is that local anesthetics block voltage-gated sodium channels by binding to a site in the lumen of that channel, thus preventing the flow of current.[16] However, this model has been challenged recently based on the finding that some local anesthetic molecules are too small to fully occlude the sodium channel. This finding has led to an alternative hypothesis that local anesthetics prevent current flow through sodium channels by introducing a positive charge that electrostatically impedes the flow of sodium ions, rather than acting by physical means. For more details, the interested reader is referred to an article by Scheuer.[17]

Fortunately for clinicians, local anesthetics work regardless of how well we understand the underlying molecular mechanisms.

SIX KEY AIRWAY MANAGEMENT DECISIONS

The process begins by making 6 key airway management decisions. The first question asks whether the condition of the airway is so bad that the airway is best managed via a tracheostomy carried out under local anesthesia. Assuming that this is not the case, and additionally, assuming that a supraglottic airway is also inappropriate, let us proceed with the assumption that awake tracheal intubation is desired. Under these assumptions, the second question is then whether one should use the oral as opposed to

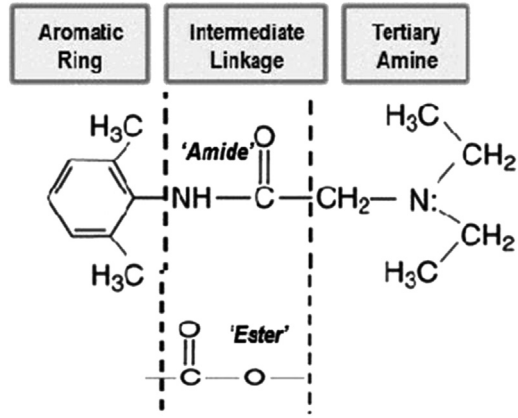

Fig. 1. Most local anesthetics have an aromatic ring on one end, a tertiary amine on the other end, and 1 of 2 forms of an intermediate linkage. This last structural difference (amide vs ester) determines the pathway by which the local anesthetic is metabolized and its potential for allergic reactions. (*From* Becker DE, Reed KL. Local anesthetics: review of pharmacological considerations. Anesth Prog 2012;59(2):90–101; with permission).