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## An Improved Regional Anesthetic Technique for Peroral Endoscopy

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Local anesthesia, incorporating a combination of topical anesthesia and intraoral field blocks, has been in use for a number of years to provide anesthesia for tonsillectomy. Recently, Barton and Williams<sup>1</sup> described the use of bilateral intraoral glossopharyngeal blocks to facilitate tonsillectomy; because this obliterates the gag reflex, they proposed using these blocks to produce anesthesia for peroral endoscopy.<sup>1</sup>

During the past two years, 70 patients at our institution have undergone bronchoscopy using a combination of bilateral glossopharyngeal blocks, bilateral superior laryngeal blocks, and a transglottic spray of local anesthetic. A number of tracheal intubations of patients requiring general anesthesia with full stomachs were performed with these nerve blocks.

### MATERIALS AND METHODS

Patients who underwent bronchoscopy were generally premedicated with a narcotic or neuroleptic, and an anticholinergic. Drugs of choice were Innovar, 0.005 ml/kg, and glycopyrrolate (Robinul), 0.001 ml/kg, mixed in the

same syringe and administered in 45 minutes prior to anesthesia.

The materials used for the nerve block and spray are shown in figure 1. The Pilling sprayer (A in fig. 1) was used to deliver a spray of 4 per cent cocaine to the tongue and pharynx prior to the glossopharyngeal blocks. Following topical anesthesia, bilateral superior laryngeal nerve blocks (fig. 2) were administered with 5 ml of a 1 per cent lidocaine (Xylocaine) solution with 1:100,000 epinephrine. The method employed was that described by Gaskill and Gillies,<sup>2</sup> in which the internal branch of the superior laryngeal nerve is anesthetized (as it pierces the thyrohyoid membrane) by inserting a 22-gauge needle at the intersection of a line drawn 1 cm anterior to the superior corner of the thyroid cartilage and a line drawn midway between the hyoid bone and thyroid cartilage. Proper depth of the injection is determined by advancing the needle until penetration of the thyrohyoid membrane is felt, or by entering the airway and then withdrawing and injecting at a point where aspiration no longer yields air. Accidental carotid-artery injection can be prevented by using the index finger to depress the carotid artery laterally and posteriorly.

The bilateral glossopharyngeal blocks were administered by using the angled tonsillar needle (D in fig. 1), and 3 ml of 1 per cent lidocaine solution were used for each injection. Substitution of 0.75 per cent bupivacaine (Marcaine) extends block duration to three hours.<sup>3</sup> The tonsillar needle was advanced through the

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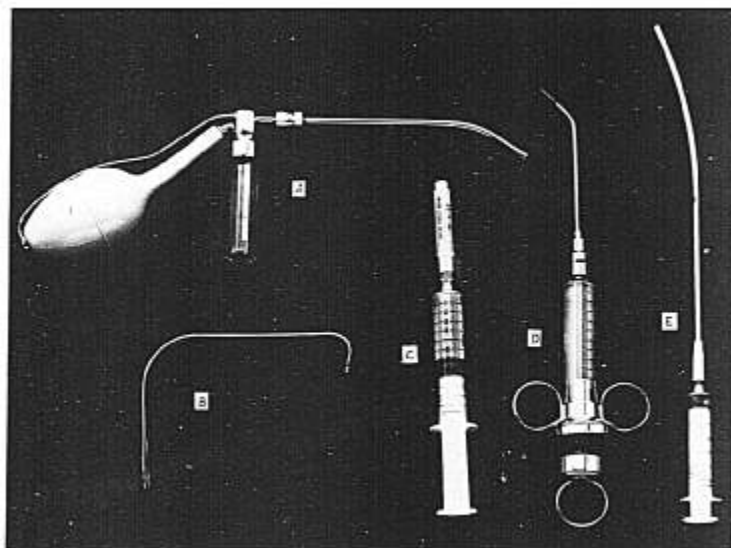


FIG. 1. Equipment (in counter-clockwise order): A, Pilling sprayer; B, angle tongue depressor; C, anesthetic for superior laryngeal nerve blocks; D, angled tonsil needle; E, laryngotracheal sprayer.

open mouth while the tongue depressor (B in fig. 1) depressed the tongue and stretched the tonsillar pillars, as shown in figure 3. The midpoint of the tonsillar pillar was visualized and the needle was passed behind the posterior tonsillar pillar and inserted into the lateral pharyngeal mucosa (and wall) to the maximum depth allowed by the 1-cm needle shaft. After careful aspiration with the three-ringed syringe, 1 per cent lidocaine, 3 ml, was injected.

After completion of the superior laryngeal and glossopharyngeal blocks, topical anesthesia (with 5 ml 4 per cent lidocaine HCl) of the larynx and trachea was easily achieved by using an LTA laryngotracheal anesthesia sprayer kit (LTA, Abbott) during direct laryngoscopy.

#### DISCUSSION

Anesthetization of the oropharynx and upper airway produces anesthesia of the areas shown

in table 1. Sensory paralysis produced by glossopharyngeal blocks aids in the passage of tubes into the posterior pharynx and through the glottis. Block of the superior laryngeal nerve anesthetizes only the internal branch and thereby preserves the integrity of the cricothyroid muscle.

The surface anesthesia produced by these blocks is intense, and so rapid in development following the glossopharyngeal block that an oral Guedal type of airway can be inserted within a minute of the completion of the block. Soft-tissue relaxation is so rapid following the glossopharyngeal block that our experience taught us to perform the superior laryngeal block prior to glossopharyngeal blocks. Administration of the superior laryngeal block between the topical spray of the oropharynx and the glossopharyngeal block allowed time for surface anesthesia to develop.

The method of anesthesia described has



FIG. 2. Needle placement for superior laryngeal nerve block.



FIG. 3. Needle placement for glossopharyngeal nerve block.

also been successfully used by us during esophagogastroscopy when patients required respiratory support. We have used the topical cocaine spray with glossopharyngeal block alone during uncomplicated cases of esophagogastroscopy to prevent gagging.

A modification of the technique that has been especially useful has been to combine the topical cocaine spray with both glossopharyngeal and superior laryngeal blocks for tracheal intubation of patients with full stomachs who require general anesthesia. This profoundly anesthetizes the posterior third of the tongue, pharynx, supraglottic larynx, and rima glottidis, but leaves the sensory trachea and intrinsic laryngeal muscles intact.<sup>3</sup> Depression of the gag reflex seems to prevent the swallowing of large amounts of air, in addition to allowing a better view of the glottis. The cough reflex remains intact.

The possible complications of intra-arterial

injection or pharyngeal abscess have not been encountered in these endoscopy patients or in the 823 patients who have had glossopharyngeal nerve blocks for tonsillectomy at this institution. Self-limiting hematomas without sequelae were observed in two of our tonsillectomy patients.

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TABLE 1. Distribution of Anesthesia

Method	Sensory Anesthetic Area	Motor Paralysis
Cocaine spray	Tongue and pharynx	None
Superior laryngeal nerve block (internal branch)	Lower pharynx Laryngeal epiglottis Vallecula Vestibule Aryepiglottic fold Posterior rima glottidis	None
Glossopharyngeal nerve block	Posterior third of tongue Uvula Soft palate Pharynx	None
LTA spray (laryngotracheal anesthesia)	Subglottic larynx Trachea	None