A Novel Approach to the Challenging Injection Laryngoplasty

Ross M. Mayerhoff, MD1; Connie Kuo, MD1; Tanya K. Meyer, MD1
1. Department of Otolaryngology-Head and Neck Surgery, University of Washington

INTRODUCTION

Injection laryngoplasty (IL) is one of the oldest and most commonly performed procedures for treating vocal fold paralysis and other etiologies of glottic insufficiency. It was first described by Brünings in 1911 as an awake perioral technique with guidance by mirror indirect laryngoscopy. Like other treatments in laryngology, it has undergone evolution over the last century from the office to the operating room and recently back to the office. The awake IL stands as a go-to procedure for many patients with glottic insufficiency because it is safer, provides immediate feedback, is lower cost, and avoids the risk of general anesthesia. Despite this, IL via DL under general anesthesia remains a useful option for patients who cannot tolerate an injection while awake or require increased precision. It is also a good option for lower volume otolaryngologists. A review of patterns in seven busy laryngology practices indicated that about half of the ILs were performed in the office and half in the OR via DL. Although awake and DL techniques allow many patients to benefit, there is a cohort of patients who may not endure an unsedated injection due to poor tolerance or altered mental status. Additionally, there are some patients in whom DL under general anesthesia is either impossible or unsafe. Examples include patients with cervical spine precautions and/or with comorbidities that anesthesiologists deem too risky to undergo general endotracheal anesthesia with paralysis. For these specific patient populations, we aim to describe the feasibility of a hybrid technique using sedation, a supraglottic airway (LMA™), and a flexible laryngoscopy. We refer to this technique as supraglottic airway laryngotracheal intervention (SALTI).

METHODS

Operative procedure

General anesthesia is induced and the airway is maintained with an LMA. A flexible laryngoscope attached to a video tower is then passed through the lumen of the LMA through a swivel adaptor until the vocal folds are observed. With spontaneous ventilation, respiratory movement should be observed in the mobile vocal fold. Next, the percutaneous IL technique of the surgeon’s choice is employed. Our preference is the transcricothyroid submucosal approach. If the respiratory motion of the vocal folds impairs injection, succinylcholine can be administered for brief paralysis. The patient is then allowed to awaken and the LMA is removed, concluding the procedure.

RESULTS

Seventeen patients underwent IL using the SALTI technique with no complications or poor tolerance reported. Patient characteristics are outlined in Table 1. Nine of the 17 patients had outpatient otolaryngology follow-up. One patient died of her neurologic comorbidities. Patients who were lost to follow-up included those who lived in another state or were discharged to a skilled nursing facility where follow-up arrangements can be challenging. Regardless, 12 out of 17 patients had either inpatient and/or outpatient speech language pathology (SLP) post-operative assessments available for review. Of the 15 patients with dysphonia, 73% of patients experienced improved voice quality, as determined either subjectively by the patient or by SLP. Of the 12 patients who presented with dysphagia, 58% demonstrated better swallowing function or complete resolution of dysphagia with advancement of their diet. The remaining 42% experienced no change or worsening of swallowing function.

DISCUSSION and CONCLUSIONS

• Airway management with LMA is not commonly used, but has been described for other laryngeal procedures
• As the first report of its use for IL, we show that it is a feasible technique
• It is useful for reaching a population that could not easily receive IL with other techniques, such as patients with c-spine precautions
• This technique may also be more accessible to the general otolaryngologist who does not have a practice that includes awake office IL
• SALTI is a useful technique to be familiar with in addition to other described techniques including awake, DL, and general anesthesia with GlideScope because it allows the otolaryngologist to provide this useful intervention to a greater number of patients and adapt to more challenging clinical scenarios.

Table 1: Patient Characteristics

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<th>N = 17</th>
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<td>Average age</td>
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<tr>
<td>Male</td>
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<td>Inpatients</td>
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Indication for injection laryngoplasty

| Paralysis/Paralysis | 15/17 (88%) |
| Bowing | 1/17 (6%) |

Co-morbidities

| Neurologic | 8/17 (47%) |
| Cardiac | 5/17 (28%) |
| Infectious | 3/17 (17%) |
| History of trach | 3/17 (17%) |

Selected References

Figure 1: Technique being performed