Case report

**Dexmedetomidine supplemented with local anesthesia for awake laryngoplasty**

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**Abstract** Certain laryngeal procedures require a sedated patient who is responsive to allow for the assessment of vocalization. Dexmedetomidine as a single agent for sedation and anxiolysis for awake laryngoplasty in a patient with unilateral vocal fold paralysis is presented.

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1. **Introduction**

In otorhinolaryngologic surgery, sharing the airway with a surgeon can present challenges to the anesthesia team. In addition, in certain laryngeal procedures, keeping the patient responsive can be of utmost importance. Dexmedetomidine as a single agent for sedation and anxiolysis in a patient undergoing awake laryngoplasty for unilateral vocal fold paralysis is presented.

2. **Case report**

An 82-year-old, 70 kg, 169 cm man with history of insulin-dependent diabetes mellitus, hyperlipidemia, and extensive cigarette smoking, was scheduled for an awake, Type I laryngoplasty for treatment of left vocal fold paralysis. Medications included simvastatin, terazosin, insulin glargine, and glucagon as needed. The patient had a history of viral polyneuropathy manifesting as pain in the distribution of the supraorbital nerve, significant degradation of his voice, and an asymmetrical palate. All of his symptoms gradually subsided with the exception of dysphonia related to the paralysis of his left vocal fold, causing a large glottic gap. Consequently, the patient was scheduled for an awake flexible fiberoptic laryngoscopy and Gore-Tex graft medialization of the left true vocal fold.

In the operating room, standard ASA monitors were applied, as well as a MAC-safe nasal canula (Hull Anesthesia, Inc., Huntington Beach, CA, USA) to monitor end-tidal CO₂ concentration. Dexmedetomidine was initiated with an intravenous (IV) loading dose of one mcg/kg delivered over 15 minutes, followed by an infusion rate of 0.6 mcg/kg/hr. Subsequently, the dexmedetomidine infusion...
Fig. 1  Photograph showing the setup and surgical field where the laryngeal cartilage was accessed through a small horizontal incision in the neck.

was titrated to effect and discontinued when the main part of the procedure was completed.

The right naris was topicalized with a 4% cocaine solution. A flexible fiberoptic scope was placed and then suspended from a hanging stand to allow for laryngeal visualization during surgery. Following an injection of 10 mL of a mixture with a final concentration of 0.5% lidocaine, 1:200,000 epinephrine, and 0.25% bupivacaine into the skin and subcutaneous tissues, the laryngeal cartilage was accessed through a small horizontal incision in the neck. After a window was formed in the cartilage (Fig. 1), the patient was asked to phonate for intraoperative assessment of the optimal medialization. The Gore-Tex graft was secured in place, allowing for permanent medialization of the vocal fold. The patient maintained spontaneous respiration while breathing O₂ at 4-6 L/min. Arterial oxygen saturation, as measured by pulse oximetry, was maintained between 95% and 100%, except in one instance when the airway obstructed and a chin lift was necessary. In the beginning, his blood pressure gradually declined from 170/90 mmHg to 90/55 mmHg. Blood pressure then stabilized around 120/70 mmHg after the dexmedetomidine infusion was stopped. His heart rate (HR) remained at approximately 70 beats per minute (bpm). Total surgery time was three hours. The patient was then admitted to the Postanesthesia Care Unit (PACU) in stable condition and observed in the hospital over the next 24 hours.

3. Discussion

The physiological basis of surgery for unilateral vocal fold paralysis is the medialization of the paralyzed vocal fold to close the glottal gap on phonation so that the normal vocal fold can make contact with the paralyzed side. This repair requires continuous intraoperative visualization of the vocal folds, especially during phonation, in order to assess the extent of the defect and the results of the repair [1]. Consequently, the patient needs to remain responsive and to cooperate when asked to phonate. Such cooperation is not always easily achieved with traditional sedatives such as fentanyl, midazolam, and/or propofol. In addition, these agents have well-known respiratory depressant effects.

Dexmedetomidine is an alpha-2 adrenoreceptor agonist with α₁:α₂ receptor selectivity of 1:1620. Dexmedetomidine provides adequate sedation [2]. This sedation is unique in that patients are sedated and sleepy, but are easily aroused when stimulated and are able to follow commands [3]. Dexmedetomidine also produces analgesia [2] and amnestic effects [4], and it has antisynergistic properties [5]. Dexmedetomidine preserves respiratory function even when administered in higher than recommended doses for sedation [6,7]. This ability to provide sedation with rapid return to wakefulness, analgesia, amnesia, and antisynergy with respiratory sparing characteristics, renders dexmedetomidine ideal for use in awake unilateral vocal fold paralysis surgery.

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References