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CLINICAL INFORMATION

Sedation using dexmedetomidine and remifentanil with local anesthesia for intraoperative speech monitoring: a case report



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KEYWORDS

Laryngoplasty;
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Abstract

Background and objective: Some surgical procedures such as laryngoplasty require patients to remain conscious during the intraoperative phase in order to enable speech monitoring. Dexmedetomidine and remifentanil were used in this study, since they promote appropriate patient collaboration with facilitated awakening, and are rapidly eliminated.

Case report: The patient complained of dysphonia, which had resulted from unilateral vocal fold paralysis after previous thyroidectomy. The surgical treatment was performed under local anesthesia in association with sedation using dexmedetomidine and remifentanil. The patient was stable and cooperative during the entire intraoperative period, without desaturation and with rapid postoperative awakening.

Conclusion: Dexmedetomidine and remifentanil can be used for safe sedation; however, the presence of an anesthesiologist is required during the entire intraoperative period.

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PALAVRAS-CHAVE

Laringoplastia;
Dexmedetomidina;
Remifentanil

Sedação com dexmedetomidina e remifentanil em anestesia local para monitoração intraoperatória da fala: um relato de caso

Resumo

Justificativa e objetivos: Alguns procedimentos cirúrgicos requerem que o paciente se mantenha consciente no intraoperatório, como as laringoplastias, para que a monitoração da voz

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seja feita. Optamos pelo uso de dexmedetomidina e remifentanil por serem fármacos que proporcionam adequada colaboração do paciente com fácil despertar, sendo rapidamente eliminados do organismo.

Relato de caso: Paciente com queixa de disфония por paralisia de corda vocal unilateral após realização de tireoidectomia. O procedimento foi realizado com anestesia local associada à sedação com dexmedetomidina e remifentanil. A paciente ficou estável e colaborativa durante toda a operação, sem períodos de dessaturação e com rápido despertar pós-operatório.

Conclusão: Dexmedetomidina e remifentanil podem ser utilizados para sedação com grande segurança, mas isso não dispensa a necessidade do cuidado por um anesthesiologista em tempo integral durante o procedimento.

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Introduction

Laryngoplasty is a surgical procedure used for treating dysphonia related to glottal insufficiency. The procedure presents relatively low algic potential; however, it requires intraoperative speech monitoring. In the past, it was performed using only local anesthesia, which caused considerable discomfort to the patient and hindered the surgical procedure.^{1,2} Thus, this case report describes the use of dexmedetomidine and remifentanil sedation in association with local anesthesia in laryngoplasty.

Case report

A 50-year-old female patient (weight 59 kg [130 lbs], height 1.64 m [4'12"], ASA II physical status), with gastroesophageal reflux disease (prescribed 40 mg omeprazole) and ex-smoker (smoked for 30 years), was indicated for laryngoplasty due to paramedian right vocal fold paralysis. Pre-anesthetic assessment was performed one day prior to surgery, and the patient's medical history revealed that thyroidectomy had been performed 20 years before the current procedure, resulting in postoperative dysphonia. Previous otorhinolaryngological exam results revealed right vocal fold paralysis, in addition to Reinke's edema and left vocal fold leukoplakia. Anatomic-pathological exams discarded malignancy. Laboratory exams presented normal results, and spirometry indicated a slightly obstructed ventilation pattern with bronchodilator response. The patient was anxious and concerned upon arrival in the operating room, although she was cooperative. Continuous ECG monitoring was performed, in addition to pulse oximetry and noninvasive blood pressure monitoring. Heart rate was 82 bpm, blood pressure was 130 × 70 mmHg, SpO₂ was 97%, and sinus rhythm was normal. Venipuncture was then performed with a 20 G catheter in the right hand.

The surgical team requested the patient to be awake, so she could talk during the surgical procedure. The team decided to perform local neck anesthesia and sedation. The patient was collaborative and consented to the use of the chosen technique. Sedation was then initiated using dexmedetomidine at a 1 µg.kg⁻¹ induction dose for 15 min,

followed by a dose of 0.2–0.7 µg.kg⁻¹.h⁻¹ associated with 0.05 µg.kg⁻¹.min⁻¹ remifentanil, both administered through continuous infusion pump. By the time the patient became sufficiently drowsy, local anesthesia was performed in the anterior neck region by the surgeon with 2% lidocaine and 0.5% ropivacaine. A nasal cannula delivered 100% oxygen at 3 L.min⁻¹ during the entire procedure.

When the surgeon required the patient to be awake and talking, the anesthetic dosage was decreased and the patient was called verbally, who then quickly woke up and complied with all required orders. No desaturation or algic complaints were observed during the procedure, and vital signs (blood pressure and heart rate) remained stable, similar to measurements performed upon the patient's arrival. Postoperative analgesia and antiemesis were performed using slowly infused 100 mg tramadol, 2 g dipyrone, and 8 mg ondansetron, diluted in 0.9% saline.

Surgery duration was 75 min and the patient woke up before leaving the operating room. She was transferred to the post-anesthetic care unit with 2 L.min⁻¹ oxygen delivered through the cannula, where she remained for 40 min; thereafter, she was discharged to the ward, with no algic and emetic complaints, non-dyspneic, and breathing ambient air. The patient was discharged from hospital the next day.

Discussion and conclusion

The physiological surgical base was the paralyzed vocal fold medialization, in order to establish contact between both normal folds and close the gap between them. Thus, the vocal folds must be constantly viewed during surgery, especially during phonation, in order to determine their optimal positions.³

For this, the patient must be responsive and collaborative whenever requested to speak. Use of traditional sedatives, such as midazolam, fentanyl, propofol, and droperidol, may lead to excessive sedation, patient collaboration impairment, and respiratory depression.³

Dexmedetomidine is a non-selective alpha-2 agonist, with 1:1600 α₁:α₂ selectivity. It promotes sedation with rapid awakening upon infusion interruption, and results in

minimal respiratory depression with analgesia, anxiolytic state, amnesia, and sympatholysis.^{3,4} The main action targets are the *locus coeruleus* and the spinal cord. Its effects are rapidly reversed by α_2 antagonists, e.g., atipamezole.⁴

Remifentanil is an opioid of similar strength and with an ultra-short half-life ($t_{1/2 \beta}$: 5–8 min) when compared to fentanyl. It is used in general anesthesia in association with hypnotic drugs and in sedation. Remifentanil increases the risk of respiratory depression, similar to other opioids, and therefore has not been routinely used as a sedation drug; however, low doses may be used for safe sedation (0.05–0.1 $\mu\text{g}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$). Due to its rapid elimination (differently from other opioids), other analgesics are required for postoperative analgesia.⁵

Therefore, laryngoplasty may be safely performed with local anesthesia and sedation using dexmedetomidine and remifentanil, although it is still important to provide oxygen to the patient and to perform efficient monitoring, in addition to having the presence of an anesthesiologist in the operating room during the entire procedure.

Conflicts of interest

The authors declare no conflicts of interest.

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