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Original article

Remifentanil: A help in topical strabismus surgery[☆]



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ABSTRACT

Objective: To analyze the analgesic effect of remifentanil, side effects and complications in topical strabismus surgery. To study the results of strabismus surgery with this type of anesthesia.

Material and method: Retrospective descriptive study. We included 39 patients undergoing strabismus surgery with topical anesthesia and analgesia-based sedation with remifentanil. The data of the anesthetic and surgical technique, surgical results and stability of the deviation angle were analyzed.

Results: Thirty-nine patients (54% women) were included, the average age was 37.4 years old. The mean follow-up was 24.5 months. The preoperative diagnoses were exotropia (21 patients), esotropia (12), paresis strabismus (4) and Duane's Syndrome (2). 15% patients had preoperative diplopia and 13 had received previous treatments. The dose range of remifentanil used was 0.05–0.2 µg/kg/min. The side effects presented were 2 cases of vomit and one of bad collaboration during the intraoperative adjustment, one of the patient reported pain and one case of thoracic rigidity was reported. 79% of the patients obtained a good surgical result and 82% reported being satisfied with the results. The reintervention rate was 5%.

Conclusions: Analgesia-based sedation with remifentanil is an useful complement to topical strabismus surgery because it reduces pain during surgery and allows the patient to collaborate during intraoperative adjustment due to its pharmacokinetic characteristics.

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Remifentanilo: una ayuda en la cirugía tópica del estrabismo

RESUMEN

Objetivo: Analizar el efecto analgésico del remifentanilo, sus efectos secundarios y las complicaciones en la cirugía tópica del estrabismo. Estudiar los resultados de la cirugía del estrabismo con este tipo de anestesia.

Palabras clave:

Anestesia tópica

Remifentanilo

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Cirugía de estrabismo Analgésica basada en sedación

Material y método: Estudio descriptivo retrospectivo. Se incluyeron 39 pacientes intervenidos de cirugía de estrabismo con anestesia tópica y analgesia basada en sedación con remifentanilo. Se analizaron los datos sobre las técnicas anestésica y quirúrgica, los resultados quirúrgicos y la estabilidad del ángulo de desviación.

Resultados: Se incluyeron 39 pacientes (54% mujeres), con una edad media de 37,4 años. El tiempo medio de seguimiento fue de 24,5 meses. Los diagnósticos preoperatorios fueron exotropía (21 pacientes), endotropía (12), estrabismos paréticos (4) y estrabismo restrictivo por síndrome de Duane (2). El 15% de los pacientes presentaban diplopía prequirúrgica y 13 habían recibido tratamientos previos. El rango de dosis de remifentanilo utilizado fue de 0,05 a 0,2 $\mu\text{g}/\text{kg}/\text{min}$. Los efectos secundarios que se presentaron fueron 2 casos de vómitos y uno de mala colaboración durante el ajuste intraoperatorio, un paciente refirió dolor franco y se reportó un caso de rigidez torácica. El 79% de los pacientes obtuvieron buen resultado quirúrgico y el 82% refirieron estar contentos con los resultados. La tasa de reintervención fue del 5%.

Conclusiones: La analgesia basada en la sedación con remifentanilo puede resultar un complemento útil en la cirugía tópica del estrabismo, ya que disminuye el dolor durante la cirugía permitiendo que el paciente colabore durante el ajuste intraoperatorio gracias a sus características farmacocinéticas.

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Introduction

Remifentanil is a powerful and selective agonist of μ -opioid receptors of ultra-short duration and sedative effect approved by the FDA in 1996 as an analgesic for inducing and maintaining anesthesia. The advantage of remifentanil over the rest of opioids is its complete metabolism by nonspecific esterases involved in a large range of metabolic processes, which leads to rapid clearing and infrequent accumulation in patients with organic dysfunctions. Other drugs utilized in topical strabismus surgery are benzodiazepines such as midazolam, or hypnotic drugs such as propofol. In comparison with said drugs, remifentanil provides higher analgesia and lower muscular relaxation, allowing patients to remain awake and cooperate during intra-surgery adjustments.¹

Strabismus surgery with topical anesthesia enables intra-surgery adjustments that could be cause of discomfort for the patient. The pharmacokinetic characteristics of remifentanil make it an adequate supplement for strabismus surgery as it enables surgery with topical anesthesia in addition to sedation-based analgesia for patients to maintain the ability to cooperate during intra-surgery adjustments.

To date, very few studies have analyzed the usefulness of remifentanil in strabismus surgery or the dosages to be used and the side effects that could appear during surgery and in the immediate postop.

Accordingly, the present study analyzes the analgesic efficacy of remifentanil, its side effects and complications in topical strabismus surgery. It also analyzes objective and subjective postop surgical results.

Subjects, material and method

A descriptive and retrospective study carried out in the General Hospital of Segovia. The study included all strabismus

surgeries carried out with topical anesthesia and sedation-based analgesia during the 9-year interval. Overall, surgery was performed on 72 muscles of 48 eyes of 39 patients.

The study included only patients who underwent strabismus surgery with topical anesthesia and remifentanil sedation and excluded patients who received other hypnotic and/or sedative drugs.

All patients had an ophthalmological examination prior to surgery that comprised anamnesis, far and near visual acuity with best correction, anterior pole study with slitlamp and ocular fundus under pharmacological midriasis. Ocular motility was explored measuring far and near ocular deviation with prisms in the 9 diagnostic gaze positions as well as binocularity and stereopsis tests with the Worth test and TNO. Patients with diplopia also had a diplopia chart and Hess Lancaster screen. After establishing surgical indication, the patient was explained the surgical and anesthetic technique in full detail as well as the risks and benefits of surgery. Finally, all patients were assessed by the Anesthetics Department.

All patients signed an informed consent and the study protocol was designed following the ethical standards described in the Helsinki declaration for biomedical research.

The sedation-based analgesia technique with remifentanil comprises an initial administration of 1 mg of intravenous midazolam followed by remifentanil with continuous infusion pump at a dose of 0.05–0.2 $\mu\text{g}/\text{kg}/\text{min}$, beginning with a minimum dose which was increased according to patient requirements. During surgery, 2% lidocaine eye drops were instilled when patients referred pain during surgery.

Before initiating surgery, tetracaine chlorhydrate and oxybuprocaine drops (Anestésico doble[®], Alcon[®], Fort Worth, Texas, USA) and Iodine povidone (Betadine solución dérmica[®], Meda[®], Solna, Sweden) diluted at 50% with physiological serum.

Muscle surgery was performed according to the standard technique depending on the surgical indication for

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