Letter to the Editor

Multimodal analgesia in orthognathic surgery

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Received: 11 January 2022; Accepted: 29 April 2022; Published: 30 June 2022.
doi: 10.21037/joma-22-1
View this article at: https://dx.doi.org/10.21037/joma-22-1

Orthognathic surgery, as part of maxillofacial surgery, involves the correction of dentofacial deformities for both functional (occlusion, speech and sleep disturbances) and aesthetic reasons. Deformities of this kind affect between 5–10% of the general population. The underlying causes are not clear, though genetic, environmental and embryonic factors have been suggested to play a role (1). The surgical techniques used are complex, with osteotomies of the mandible and upper maxilla that allow three-dimensional displacements of both bone structures with the purpose of aligning the facial axes.

The anesthetic management of these patients constitutes a challenge for the anesthesiologist. On one hand, the surgeon and anesthesiologist must share the operating field, and preservation of the upper airway constitutes a priority concern. In this regard, anesthesiologists working with patients who suffer dentofacial deformities must have advanced knowledge of difficult airway management, since some patients present severe hypoplasia of the upper maxilla, the mandible, or both. On the other hand, most of these patients wear intermaxillary elastics during the postoperative period, and avoiding the risk of bronchoaspiration is mandatory. Likewise, adequate control of postoperative pain is crucial for ensuring patient satisfaction and optimum surgical outcomes.

Despite the advances in surgical techniques and anesthetic management, patients undergoing orthognathic surgery continue to experience moderate to severe postoperative pain (2). Poorly controlled postoperative pain can contribute to prolonged opioid use (with an associated increase in adverse events such as nausea and vomiting), chronic postoperative pain, increased morbidity and hospital costs, and worsened quality of life (3). As a result, in recent years physicians have adopted multimodal analgesic strategies to reduce postoperative pain, improve functional recovery and shorten hospital stay in fields such as general surgery, cardiothoracic surgery and trauma surgery in particular. Specifically, systematic reviews combining moderate to high levels of evidence suggest that a perioperative multimodal approach reduces pain and opioid consumption, and improves patient satisfaction in a range of different surgeries (4). Furthermore, population-based studies suggest that such a multimodal approach can reduce the costs and duration of hospital stay (5). However, few studies on the use of multimodal analgesia in maxillofacial surgery can be found in the literature (6).

The mentioned multimodal approach requires physiological, pharmacodynamic, pharmacokinetic and anatomical knowledge, and skill in the use of regional anesthesia and ultrasound use. Furthermore, improved global management of these patients requires the participation of a multidisciplinary team mainly composed of surgeons, anesthesiologists and nursing staff, with fluid and continuous communication among the team members. Accordingly, a transverse approach is needed for good perioperative pain control in orthognathic surgery.

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Different analgesic care modalities have been described in maxillofacial surgery, though to date there is no scientific evidence of which modality (type of anesthesia and its timing) is best in the concrete case of patients subjected to orthognathic surgery. In this regard, orthognathic surgery under general anesthesia and with the infiltration of local anesthetics prior to surgical incision is the most widespread practice. Nevertheless, the current guides recommend a multimodal approach to the control of pain in order to reduce postoperative discomfort and opioid use, and to attenuate the complications (7). This multimodal approach comprises a broad range of therapeutic strategies, with the use of nerve blocks and different adjuvant drugs (paracetamol, nonsteroidal antiinflammatory drugs, corticosteroids, lidocaine and other long-acting local anesthetics, ketamine, magnesium sulfate and dexmedetomidine, among others). However, the sensory innervation of the face is largely dependent upon the trigeminal nerve, with its ophthalmic, maxillary and mandibular branches. As a result, anesthesiologists with expertise in maxillofacial surgery have recently described ultrasound-guided techniques for blocking these nerves with a view to securing optimum perioperative pain control, with greater patient satisfaction, improved rehabilitation and a shorter hospital stay (8,9).

Briefly, we will describe the protocol for the anesthetic management of patients subjected to orthognathic surgery at our center with extensive experience in this field (Centro Médico Teknon, Anestalia-Instituto Maxilofacial, Barcelona, Spain). Premedication using midazolam 2 mg i.v., with antibiotic prophylaxis. Intravenous anesthetic induction (fentanyl, propofol and muscle relaxant) and maintenance with total intravenous anesthesia (TIVA) (propofol and remifentanil). After nasal intubation and pharyngeal tamponade, the surgeon performs lidocaine and adrenalin infiltrations to block the terminal branches of the maxillary and mandibular nerves, reduce bleeding in the surgical field and facilitate subperiosteal dissection. In turn, the anesthesiologist performs ultrasound-guided bilateral suprazygomatic maxillary nerve block with ropivacaine. The following adjuvant agents are administered intraoperatively: corticosteroids (methylprednisolone), antifibrinolytic treatment (tranexamic acid), gastric protection (ranitidine), antiemetic medication (ondansetron and haloperidol), analgesics (paracetamol, dexketoprofen, diclofenac) and dexmedetomidine and ketamine at subanesthetic doses. The patient is extubated in the operating room after pharyngeal tamponade removal, gastric aspiration and reversal of neuromuscular relaxation and of the airway reflexes, followed by transfer to the recovery room and subsequently to the hospital ward with intermaxillary fixation and local cold therapy. Moderate to severe pain is treated with methadone, while mild pain is controlled with paracetamol and nonsteroidal antiinflammatory drugs.

Although the current trend in anesthesiology is to use opioid-free anesthesia (OFA), there are not enough conclusive data to validate this practice (10). Our recommendation in orthognathic surgery therefore is to administer multimodal analgesia with non-opioid agents such as N-methyl-d-aspartate antagonists, local anesthetics and alpha-2-agonists, together with low-opioid anesthesia and monitoring of nociception. These additive and/or synergic combinations of analgesics and anesthetics are effective and safe in improving the postoperative outcomes of patients subjected to orthognathic surgery globally.

In sum, the use of multimodal analgesia in orthognathic surgery is essential. On one hand, it improves perioperative pain control, and on the other it avoids the undesirable effects of anesthetics and analgesics—particularly the respiratory problems associated with opioid use, such as respiratory depression. In addition, multimodal analgesia minimizes the nausea and vomiting associated to opioids, thereby reducing the risk of bronchoaspiration in patients subjected to intermaxillary fixation following orthognathic surgery.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was a standard submission to the journal. The article has undergone external peer review.

Peer Review File: Available at https://joma.amegroups.com/article/view/10.21037/joma-22-1/prf

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://joma.amegroups.com/article/view/10.21037/joma-22-1/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related

to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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doi: 10.21037/joma-22-1
Cite this article as: Molins-Ballabriga G, Hernández-Alfaro F, Giralt-Hernando M, Valls-Ontañón A. Multimodal analgesia in orthognathic surgery. J Oral Maxillofac Anesth 2022;1:20.