Zygomatic Implants Performed Under Regional Anaesthesia and Conscious Sedation

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Abstract

Modern dental surgery achieves the better results through the combination of regional anaesthesia with conscious sedation techniques. Major dental surgery can be performed safely and comfortably if the dental equipe is skilled in performing conscious sedation and specific nerve blocks using long lasting local anaesthetics. More often zygomatic implants are positioned under general anaesthesia, a safe technique, but unsuitable for the dental office. We report our personal experience regarding two patients scheduled for bilateral zygomatic implants performed under regional anaesthesia and conscious sedation. Peri-operative complications were not observed and both patients resulted utterly satisfied.

Introduction

Modern dental surgery achieves the better results through the combination of regional anaesthesia (RA) with conscious sedation (CS) techniques. Major dental surgery may be performed safely and comfortably in the dental office if CS and specific nerve blocks using long lasting local anaesthetics (LLLA) are perfectly performed. The treating staff must take into account the long duration of this stressful surgery, the consequent patient discomfort and must be ready to deal with the possible related complications. The patient must be completely informed about the proposed technique, because her/his active collaboration is mandatory for the success of surgery. Because of the fact that this technique involves an important peri-operative stress and the use of high doses of LA and vasoconstrictors, CS is absolutely necessary, also to prevent signs and symptoms of drugs toxicity.

Case Report(s)

We report our personal experience regarding the rehabilitation of the severely deficient edentulous maxilla in two patients scheduled for implantation of several maxillary implants including bilateral zygomatic implants (ZI), in a standard dental office. The patients were evaluated and informed one week in advance of surgery; 1 hour before surgery amoxacilline 2 g, was orally administered along with piroxicam 40 mg and delorazepam 2 mg, betamethasone 8 mg were administered i.v. to attenuate postoperative local tissue edema. CS was obtained through i.v. titration of diazepam until the patient referred a state of maximal subjective tranquillity. Monitoring of the patient consisted of ECG, NIBP, SpO2, BIS, and clinical observation; O2 2 l/min was administered via nasal canula. EMLA 2.5 g was applied topically 5 minutes before administration of RA, consisting of many nerve blocks and tissue infiltrations performed with 0.5% bupivacaine with epinephrine 1:200.000 (Illustration 2). Postoperative analgesia was provided by oral paracetamol, 1 g every 6 hours, and naproxene 550 mg every 12 hours. Peri-operative complications were not observed and both the patients resulted utterly satisfied (Illustration 3 and 4).

Discussion

More often ZI are positioned under general anaesthesia (GA), a safe technique, but unsuitable for the standard dental office. We report our personal experience regarding two edentulous patients scheduled for implantation surgery with bilateral ZI, performed under RA and CS in a standard dental office. Common concerns in this setting are the peri-operative stress related to major oral surgery, the patient discomfort, the possible related local and systemic complications. Non operating-room anesthesia claims had a higher severity of injury and more substandard care than operating room claims. The difficulty in oxygenation and/or ventilation is the most common cause of injury in this setting. Maintenance of minimum monitoring standards and airway management training is mandatory for all dental staff involved in patient sedation. Approximately 300,000 patients per year undergo GA for minor dental procedures in the UK. In deaths occurring on the dental chair (26 between 1984 and 1993) following cardio-respiratory failure, the cause of cardiac arrest was not clearly determined. The number of deaths in the UK, however, has decreased from 100 (1970–79) to 20 (1990–99). Inappropriate patient selection may have contributed to anesthetic complications, but...
deaths in young healthy patients have also been described and, in all these cases, care was judged to be poor. The incidence of mortality in GA performed for dentistry procedures has decreased in the latest reviews to 1–1.5 cases per million.15 Review of claims associated with sedation found that 75% of patients who experienced injury related to sedation received a combination of two or more drugs, e.g. a benzodiazepine and an opioid or propofol. We must remember a poor known intra-operative complication described in this field: the trigeminocardiac (TCR) or trigeminovagal reflex (TVR).17,18 This phenomenon can be generated as a result of procedures that increase intraocular pressure, strabismus surgery, nasal packing after rhinoplasty, the reduction of zygoma and zygomatic arch fractures, elevation of bone flap or osteotomies, reflection of a palatal flap for removal of a mesiodens, during Le Fort i down fractures, cutting maxillary tuberosity and temporomandibular joint arthroscopy. The TCR is clinically defined as the sudden onset of parasympathetic activity, hypotension, apnea, or gastric hypermotility during central or peripheral stimulation of any of the sensory branches of the trigeminal nerve. The manifestation of the TCR can vary from bradycardia and hypotension to asystole. The only way to prevent such a complication in this setting, is an effective, complete and deep RA associated to CS.

Conclusion

The patient must be completely informed about the technique and communication throughout the procedure is mandatory, because her/his active collaboration is necessary for the success of surgery. RA is obtained through many infiltrations so that adequate precautions must be used to avoid pain and stress to the patient. Because this technique involves an important peri-operative stress and the use of high doses of LA and vasoconstrictors, CS is absolutely necessary, also to prevent signs and symptoms of drugs toxicity. This technique must be considered as a complex one, limited to very skilled dental equipe, adequately prepared and expert in CS and in performing particular RA techniques using LLLA.

References


Illustrations

Illustration 1

Surgery and patients features

<table>
<thead>
<tr>
<th>Patient nr. 1</th>
<th>Patient nr. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>Female, 30 years old, 55 kg, ASA II, anxious-depressive syndrome treated with SSRI and BUZ</td>
</tr>
<tr>
<td>Dental treatment</td>
<td>8 maxillary implants, including 2 zygomatic implants</td>
</tr>
<tr>
<td>Duration/complications of surgery</td>
<td>110 minutes / uneventful</td>
</tr>
<tr>
<td>Diazepam’s dose</td>
<td>42 mg</td>
</tr>
<tr>
<td>Patient’s opinion</td>
<td>Fully satisfied</td>
</tr>
</tbody>
</table>

Legend: SSRI = Serotonin Reuptake Inhibitors; BUZ = Benzodiazepines; ASA = American Society of Anesthesiologists.

Illustration 2

RA techniques used in our patients

<table>
<thead>
<tr>
<th>RA</th>
<th>Anesthesia 0.5% with epinephrine (1:200000) admixture volume</th>
<th>Needle</th>
<th>Anesthetized area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilateral PNS block</td>
<td>2 ml side</td>
<td>25G x 25mm</td>
<td>Soft and loose tissue of nasal cavity, skin over the superior turbinate, nasal septum</td>
</tr>
<tr>
<td>Bilateral infraorbital nerve block (Ala block)</td>
<td>2 ml side</td>
<td>27G x 25mm</td>
<td>Soft and loose tissue between the two superior alveolar nerves, maxillary tuberosity, periosteum of the infraorbital rim</td>
</tr>
<tr>
<td>Bilateral mental nerve block</td>
<td>1.5 ml side</td>
<td>25G x 25mm</td>
<td>Upper lip, lower lip, chin, and mandible</td>
</tr>
<tr>
<td>Nasopalatine nerve block</td>
<td>1 ml</td>
<td>25G x 25mm</td>
<td>Soft and loose tissue between the canine and incisor</td>
</tr>
<tr>
<td>Bilateral MPA block</td>
<td>2 ml side</td>
<td>27G x 25mm</td>
<td>Maxillary bone</td>
</tr>
<tr>
<td>Bilateral Zygomatico-maxillary, Zygomatico-temporal nerve blocks</td>
<td>1 ml side</td>
<td>27G x 38 mm</td>
<td>Zygomatic bone</td>
</tr>
<tr>
<td>Dose of drugs used for RA</td>
<td></td>
<td></td>
<td>Désc.: 1.0 mg</td>
</tr>
</tbody>
</table>

Legend: ASA = Intercuspal Superior Alveolar; MPA = Middle Superior Alveolar; PSL = Perioral Superior Alveolar; PNS = Palatine Nerve Superior; RA = Regional Anesthesia; Zygomatico-maxillary = Zygomatico-maxillary; Zygomatico-temporal = Zygomatico-temporal.
Illustration 3

Post operative x-ray: 8 maxillary implants, including 2 zygomatic implants

Illustration 4

Post-operative x-ray: 10 maxillary implants, including 2 zygomatic implants
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