Orbitozygomatic Complex Fracture Reduction Under Local Anesthesia and Light Oral Sedation

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Purpose: Closed hook reduction is a well-accepted approach in reducing selected cases of isolated orbitozygomatic complex fractures. The potential of achieving such reductions under light sedation and local anesthesia has many potential benefits over general anesthesia and should therefore not be overlooked. The goal of this study was to verify if closed reduction under local anesthesia is a feasible alternative to reduction under general anesthesia for selected cases of orbitozygomatic complex fractures. Furthermore, an attempt was made at identifying those who would benefit from such an option without compromising end results as opposed to those who would require open reduction with the use of internal fixation devices (ORIF) to ensure favorable outcomes.

Materials and Methods: Over the period of July to October 2005, we attempted to reduce 8 consecutive orbitozygomatic complex fractures on an outpatient basis with the use of local anesthesia.

Results: We have successfully reduced 6 of 8 such fractures.

Conclusion: Closed hook reduction under light sedation and local anesthesia is a feasible and safe procedure in selected cases of noncomminuted zygomatic fractures. Coupling both physical examination and immediate postoperative radiographic evaluation ensures substantiation of accurate reduction and permits immediate final corrections if considered necessary.

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Fractures of the orbitozygomatic complex are relatively common in maxillofacial surgery practices. The prominence of the zygoma and its location on the facial skeleton renders it susceptible to external trauma and accounts for the fact that this facial bone is one of the most frequently fractured. The 2 options available for treating displaced malar bone fractures are closed reduction and open reduction with the use of internal fixation devices (ORIF). Closed reduction can be accomplished transcutaneously with a hook or a Carroll-Girard screw, intraorally as described by Keen,[1] or through a Gillies approach. Although abundant literature exists on the procedures themselves, very few papers discuss the possibility of reducing such fractures under local anesthesia. In 1981, Manstein et al[2] described a technique by which local anesthesia coupled with intramuscular sedation was used to reduce zygomatic arch fractures via Gillies method in elderly patients at high risk for general anesthesia. The technique was not used for orbitozygomatic complex fractures themselves, and the described procedure was not intended for customary clinical use. In 1990, Schnetler[3] described an intraoral technique by which zygomatic complex fractures may be reduced with the use of local anesthesia and intravenous sedation. However, the author makes little mention of postoperative results and the way to ensure accuracy of the reduced fractures.

Based on our clinical experience in treating orbitozygomatic fractures, we realized that selected

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cases of noncomminuted (monoblock) zygomatic fractures could be reduced anatomically by simple closed hook reduction. Because we were already treating cases of isolated zygomatic arch fractures under local anesthesia, we decided to conduct a study to verify if we could reduce these zygomatic complex fractures under local anesthesia on an outpatient basis. The following report describes the surgical technique and presents our preliminary results. Furthermore, an attempt is made at identifying the patients who will benefit from such an option without compromising end results as opposed to those who will require ORIF to ensure favorable outcomes.

Materials and Methods

Informed consent was obtained in all cases. The patient was given 1 mg of lorazepam sublingually 30 minutes before the procedure and then placed in a semi-seated position. The patient was prepped and draped to ensure a sterile field. A standard dental syringe with a 27-gauge needle of 0.4 × 35 mm was used to inject 1 to 2 cc of 4% articaine with 1:200,000 adrenaline over the frontozygomatic and zygomaticotemporal sutures as well as over the infraorbital rim via a transcutaneous approach. Afterwards, an intraoral injection was used to anesthetise the zygomaticomaxillary buttress and perform an infraorbital block. A sphenopalatine fossa block was then accomplished by directing the needle lateral and superior to the zygomaticomaxillary buttress and injecting 2 cc of local anesthetic in the area around the pterygomaxillary fissure by directing the bevel of the needle medially. Finally, the area underlying the stab incision and the trajectory path of the J hook were infiltrated down to the malar bone.

Fifteen to 20 minutes later, a stab incision using a #15 blade was performed at the intersection of a vertical line dropped from the lateral canthus and a horizontal line crossing the nasal base. This incision was oriented along the relaxed skin tension lines of the face to maximize esthetic outcome. A J-shaped curved zygoma hook was inserted percutaneously just under the zygoma. It is important to confirm tip placement of the hook on the under surface of the body of the zygoma to avoid the thin bony wall of the posterior maxilla. A vector direction opposite to the one having created the fracture was applied in a controlled manner. This direction was approximated by the history of trauma, physical examination, and preoperative CT findings. The index finger of the operator's free hand was placed over the infraorbital rim to fully appreciate reduction of the zygoma. A to-and-fro motion may be necessary to disimpact the malar complex. An audible click may sometimes be heard once reduction is accomplished. Proper reduction was then evaluated by physical examination coupled with immediate postoperative radiographic evaluation. A steri-strip (0.25 × 1.5 inch 3M adhesive skin closures; 3M, St Paul, MN) was placed over the incision site and the patient sent for immediate radiographs that consisted of a Waters view, a 30° caudally oriented AP view (Townes view), submentovertex (Hirtz) view, and a Hirtz view with a 15° rotation and zoomed on the arch. If judged necessary, corrections are made. Reanesthetizing may be required if the time elapsed between radiographic confirmation and second attempt is over 40 minutes.

Patients were then observed for 1 hour in clinic and discharged when stable. They were instructed to avoid pressure over the cheek and to sleep in a semi-seated position for 2 weeks. Furthermore, a soft diet was recommended for the same period. If, despite successful reduction, the zygoma seems to be unstable on digital pressure or if results are unsatisfactory after several attempts, the procedure may be withheld and arrangements made for open reduction and internal fixation under general anesthesia. The patient was seen again within 1 week and then 4 weeks post-reduction to re-evaluate results and stability. If any doubt existed on the accuracy of achieved results, a CT was ordered.

Results

To focus on orbitozygomatic complex fractures, we have excluded reduction results of isolated zygomatic arch fractures, which are also routinely reduced under local anesthesia. Most of the patients included in this prospective study were male, with a mean age of 45 years (Table 1). All patients had a preoperative CT scan in axial and coronal views. In 3 patients, the injury occurred as a result of physical assault; whereas the injury was caused by fall in the remaining 5. Clinical features at presentation included facial asymmetry, trismus, infraorbital nerve anesthesia, periorbital hematoma, and facial lacerations. All patients had a noncomminuted (monoblock) zygomatic fracture without any orbital involvement or signs and symptoms that would dictate open exploration. All patients were treated within 7 days following trauma, except 1 who came to our attention 24 days following the incident. Mean delay from diagnosis to operation was 1.5 days. All patients found the procedure to be acceptable except 1 who had not been premedicated. The subjects' comfort level was assessed using a system in which patients were asked to grade overall comfort on a scale from 1 to 10, 1 representing no discomfort and 10 representing the most intense discomfort perceivable. Subject comfort level was then classified into excellent (1 or 2), satisfactory (3 or 4), and unacceptable (5 or more). Closed reduction was