Infraorbital nerve transpositioning into orbital floor: a modified technique to minimize nerve injury following zygomaticomaxillary complex fractures

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Objectives: Transpositioning of the inferior alveolar nerve to prevent injury in lower jaw has been advocated for orthognathic, pre-prosthetic and for implant placement procedures. However, the concept of infra-orbital nerve repositioning in cases of mid-face fractures remains unexplored. The infraorbital nerve may be involved in trauma to the zygomatic complex which often results in sensory disturbance of the area innervated by it. Ten patients with infraorbital nerve entrapment were treated in similar way at our maxillofacial surgery centre.

Materials and Methods: In this article we are reporting three cases of zygomatico-malar complex fracture in which intra-operative repositioning of infra-orbital nerve into the orbital floor was done. This was done to release the nerve from fractured segments and to reduce the postoperative neural complications, to gain better access to fracture site and ease in plate fixation. This procedure also decompresses the nerve which releases it off the soft tissue entrapment caused due to trauma and the organized clot at the fractured site.

Results: There was no evidence of sensory disturbance during their three month follow-up in any of the patient.

Conclusion: Infraorbital nerve transposition is very effective in preventing paresthesia in patients which fracture line involving the infraorbital nerve.

Key words: Infraorbital nerve transposition, Paresthesia, Zygomaticomaxillary complex fractures

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I. Introduction

Acute loss of sensory function of the infraorbital nerve following orbitozygomatic complex fractures is often seen because of their close proximity as the nerve passes through the infraorbital sulcus in the floor of the orbit to exit through the infraorbital foramen. Traumatic injury to the infraorbital nerve may be due to compression, edema, ischemia, or laceration.

Persistent hypoesthesia following correction of mid-face and zygomatic complex fractures indicates injury to the infraorbital nerve. Although hyperesthesia along the distribution of the infraorbital nerve has been documented, it is comparatively rare in occurrence. The incidence of long-term neurosensory deficits in different studies varies from 10% to 50%.

The incidence of mid-face and zygomatic complex fractures presenting with fracture lines running through the inferior orbital foramen resulting in post-traumatic sensory disturbance has been well studied and documented through the years. The most commonly documented cause for such sensory disturbance is nerve impingement by fractured segments which have been reduced or fixed inadequately. This inaccessibility is compounded by the impeding course of the infraorbital nerve. The other cause is formation of fibrous or calcified tissue around the infraorbital nerve postoperatively, leading to nerve compression.

A review of literature provides strong evidence and varied methods for nerve decompression. However the documented successful outcomes are not reported with individual techniques, which could result in temporary or permanent sensory loss.

To overcome this, we describe a new technique of reposi-
tioning the infraorbital nerve into the orbital floor before re-
duction and stabilization of the fractured zygomatic complex.

II. Materials and Methods

Two male and one female patients with history of road traf-
fi accidents reported to the hospital emergency room. Clin-
cal and radiological examination (Fig. 1) revealed a displaced
zygomaticomaxillary complex fracture on the left side for
one of the patients and on the right for another. (Fig. 2, 3) The
third patient had a LeFort III fracture on the left and LeFort II
on the right side. Open reduction and internal fixation under
general anesthesia was planned for all the patients.

Surgical procedure

An intraoral approach was used to expose the zygomatic
complex. Two percent lignocaine hydrochloride with adrena-
line (1 : 80,000) was infiltrated at the site of incision. The
incision was made in the buccal vestibule in the high muco-
buccal fold area extending from canine to second molar region.

Fig. 1. Para-nasal sinus view.
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Fig. 2. Fracture line running through infraorbital canal.
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Fig. 3. Dissection of the nerve to free it from fracture line.
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Fig. 4. Line diagram showing fracture line running through the in-
traorbital foramen.
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operatively and postoperatively, and on both the affected and contralateral sides as a control.

The test was done separately on the lip and paranasal area using a caliper.

### III. Results

There was no evidence of sensory disturbance during their three month follow-up in any of the patient.

### IV. Discussion

Chronic sensory disturbance in the form of hypo- or hyper-
Infraorbital nerve transpositioning into orbital floor

V. Conclusion

Infraorbital nerve transposition is very effective in preventing paresthesia in patients which fracture line involving the infraorbital nerve.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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