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Endoscopic Assisted Open Reduction and Internal Fixation of Zygoma Body Fracture: A Technical Note

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Abstract

Zygoma fractures account for about 57.7% of fracture in the orofacial region. It is the most common facial bone being fractured because of its prominence. The most common etiology of zygoma fracture being RTA and assault. The conventional treatment approach for fracture of the zygoma is either extraoral or intra oral approach. Although intra-oral approach being more common in management of zygoma fracture, the fracture of the body of the zygoma at the superior aspect requires excess stripping of the periosteum and also leads to damage of the infraorbital nerve. To reduce this complication and to avoid scar formation by external approach, this article describes the endoscopic approach for the management of the body of the zygoma fractures and also describes the advantages and limitations of this procedure.

Keywords: Endoscope, Body of Zygoma, Fracture, Open Reduction, Trauma, Esthetics

Introduction

In the field of oral and maxillofacial surgery, the management of facial fractures has evolved with time. Many new technologies for facial fracture repair have been developed, but the notion of restoring anatomy, eliminating deformity, restoration of normal occlusion, masticatory abilities, minimizing morbidity of soft tissues and early return to normal function remains the same.

Modern reconstructive surgery has focused on the accuracy, and reliable restoration of the facial bony framework; however, the soft tissue complications following extra oral surgical approaches persist as a lasting reminder of the original injury.

The common approaches to the zygoma and the infra - orbital rim are sub-ciliary, sub-tarsal, infra-orbital rim incision, and lateral eyebrow incision. The complications following these are ectropion, entropion, lid oedema, hypertrophic scar and sclera exposure.

In this era, patients are more concerned about their aesthetic appearance; look for reduced hospital stay and want to initiate their normal functional habits as soon as possible. Endoscopic guided fracture reduction and fixation is one such approach reducing the morbidity of tissues with less invasive procedures and reducing the facial scar.

Over the last couple of decades, many innovative surgeons have applied alternative endoscopic approaches to facial fracture repair to achieve results equal to traditional open approaches but with reduced morbidity. The use of endoscopes with specialized retractors and use of appropriate armamentarium offers a great advantage for fixation of fractures with minimal access, better tissue handling and reduction of facial scar.[1] Long lever arms and magnification capabilities of endoscopic instruments permit working through small stab incisions located away from vital structures. Strategic exposure using precise equipment decreases the need for wide soft-tissue degloving. Endoscopes minimize the risk of otherwise invasive procedures and the surgeon can visualize the structures which are difficult to access[2]. It also has high patient acceptance and to preservation of vital structures such as the preservation of infra orbital nerve. This article describes the use of endoscopes for the management of high zygoma body fractures and also describes the anatomy and limitation of the procedure

The below 3D CT shows the fractured body of the Zygoma at a higher level just below the level of infra orbital rim running laterally and the buttress. These fractures requires greater exposure which have various complications with scar being the most common as when the approach is external.

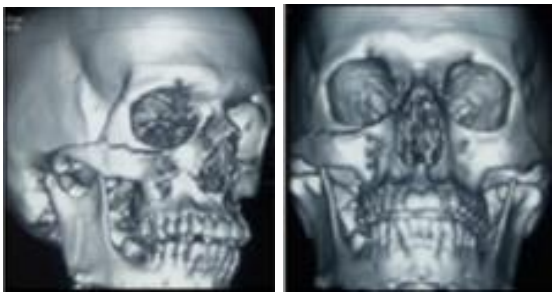

Figure 1a & 1b: 3D CT Images depicting Zygoma body fracture

In this technique we used a 30^0 4 mm endoscope with a xenon light source for visualization of the operating field

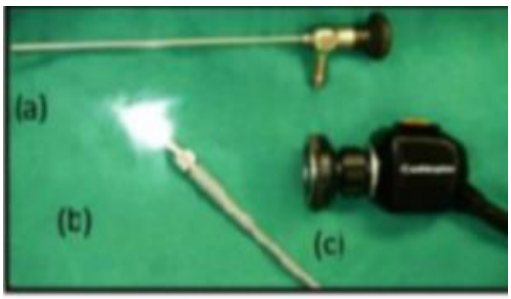

Figure 2:

After the administration of General anesthesia, 2% lignocaine with adrenaline (1:200,000) was administered at the surgical site. A muco-vestibular incision of about 1 to 1.5 cm near the canine to premolar region for the introduction of endoscope and mini plate. The mucoperiosteal flap was tunneled preserving the infraorbital nerve. The fracture segment over the right body of the zygoma was identified which was obliquely extending below the infraorbital rim extending to the zygomatic arch, the floor of the orbit being intact. Two 4 holed 1.5 mm straight miniplate was introduced through the intraoral incision and the adaptation was done under the guidance of endoscopic visualisation. Following the adaptation of plate, fixation of screws was done with the help of trocar via a stab incision along the skin crease lateral and inferior to the lateral palpebral fissure. The anatomy of the infraorbital foramen and the infraorbital nerve was analysed before the insertion of the screw via the trocar.

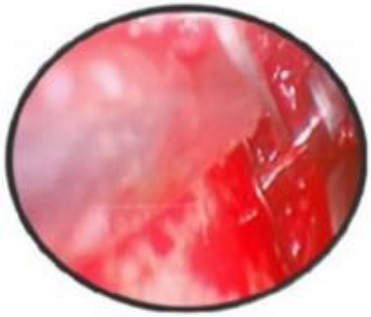

Figure 3a: Initial drilling with the help of hand piece.

Figure 3b: Placement of screw with the help of trocar

Figure 4: Post op X-ray PNS

The fracture was fixed with the help of 2 miniplate and eight 1.5 x 6 mm screws. The closure of the intraoral incision was done using 3.0 vicryl and the extraoral stab incision was closed using 5.0 vicryl. Postoperative Xray PNS was taken which revealed adequate reduction and fixation.

On the second day postoperatively the patient had minimal edema and pain and the patient was comfortable. After one week the patient was reviewed. The mouth opening was adequate. There was no evidence of injury to the infraorbital nerve, with no signs of paresthesia or any pain and was satisfied with the minimal extraoral scar. On examination the scar was minimal. The patient was followed at 1,3 and 6 weeks and patient was not having any complaints.

Results

The use of endoscope in zygoma fractures especially in cases where the fracture is superiorly placed aids in better visualization of the surgical site and also reduces the damage to the infraorbital nerve. The use of endoscope also prevents the use of extra oral incision thus minimizing the extraoral scar and is esthetically acceptable. The stabilization and fixation of the fracture was same as that of any intraoral approach with minimal stripping of periosteum and preventing ectropion caused due to subciliary approach.

Discussion

Endoscopes have been used extensively in the field of oral and maxillofacial surgery. It minimises the morbidity of tissues and avoids the extra oral scars. It also provides better visualization of the surgical field and help the surgeon to orient to the anatomical structures which cannot be visualised through small curvilinear incisions the endoscopic assisted open reduction and internal fixation of body of zygoma fractures produces similar results in comparison with the conventional extra oral approaches[3]. However, endoscopic approaches have a clear advantage over conventional extra oral approaches in terms of blood loss, scarring and associated complications[4,5]. The only drawback of the endoscopic approach was the increased duration of surgery. This can be attributed to the increasing experience of the surgeon and better orientation of the assistants to the endoscopic approach. Another confounding factor may be the lack of proper armamentarium, which can definitely reduce the duration of surgery further.

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