The Relation of Post-Traumatic Enophthalmos and Orbital Volume Defects Correction

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To my family

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LISTS OF ABBREVIATIONS

Abbreviation	Term
ZCF	Zygomatic complex fractures.
NOE	Naso-orbito-ethmoidal.
CT	Computed tomography.
DICOM	Digital Imaging and Communications in Medicine.
3D	Three dimensional.
mL	Milliliter.
ZOF	Zygomatico-orbital fractures.
BOF	Blow-out fractures.
MRI	Magnetic resonance imaging.
OV	Orbital volume.
ORIF	Open reduction and internal fixation.
SBIs	Screw-bone interfaces.
IOR	Inferior orbital rim.
ZF	Zygomaticofrontal.
ZM	Zygomaticomaxillary.
HIV	Human immunodeficiency virus.
MIO	Maximum interincisal opening

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INTRODUCTION

The bony orbits are paired; pyramidal shaped cavities whose walls converge to the apex and with the base opening forward. Orbital cavities contain the globe, extraocular muscle and orbital fat. The orbit is particularly susceptible to fractures because of its exposed position and thin bones. Facial trauma could induce isolated orbital fractures or a combination with other fractures as in zygomatic complex fractures (ZCF) and naso-orbito-ethmoidal (NOE).

Orbital fractures carry the risk of several complications including; enophthalmos, diplopia, visual loss, as well as visual field disturbance due to muscle entrapment. Post-traumatic enophthalmos is relatively common complication of internal orbital fractures. Several devices and methods have been established to determine the degree of corneal projection, among which Hertel exophthalmometer still the most commonly used device. It has the ability to determine absolute, relative, as well as comparative exophthalmometry.

The etiology of post-traumatic enophthalmos is controversial; post-traumatic volumetric changes of the bony orbit are proposed to be the primary cause. Enlarged bony orbit following zygomatico-orbital fracture (ZOF), or floor and/or medial orbital wall blow out fractures (BOF), leads to the displacement of orbital content inferiorly and posteriorly. Other etiological factors were proposed including; post-traumatic fat atrophy, scar contracture and loss of ligament support which reduce the globe support leading to posterior displacement and then enophthalmos.