Efficacy of Endoscopic Transantral versus Transorbital Surgical Approaches in the Repair of Orbital BlowOut Fractures-(Randomized Clinical Trial).

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Dedication

This work is especially dedicated

To

- *The pure soul of my dad; your supporting arm always on my shoulder. Rest in peace dear father.*
- *To the source of love, care and support in my life: to my family.*

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
EOM	Extra-ocular muscles
BOF	Blowout fracture
CT	Computerized tomography
SLIM	Superior, lateral, inferior, medial
(HDPE)	High density porous polyethylene
(PDS)	poly-d-dioxanone
GBR	Guided bone regeneration
PT	Prothrombin time
PTT	Partial thromoplastin time
INR	International normalized ratio
RAE	Right angle endotracheal tube
IM	Intramuscular
SPSS	Statistical Package for Social Sciences
SD	Standard deviation

CONTENTS

INTRODUCTION

Orbital floor fracture is one of the most common facial skeleton fractures after mid facial trauma, accounting for up to 40% of cranio-facial injuries. Patients may complain of ocular symptoms, aberration of aesthetic appearance, and dysesthesia around the damaged cheek. [1]

The indication for repair of orbital wall fractures is based on the clinical symptoms, exophthalmometry and computed tomography (CT). The timing of treatment, surgical technique and type of reconstruction material used is debated. Some advocate following the post trauma course for the development of diplopia or enophthalmos before starting treatment. [2]

Although a variety of approaches to orbital floor fractures have been proposed, satisfactory postoperative results have not been obtained in all cases. The key to successful surgical repair of these injuries is adequate exposure, visualization of the posterior bone shelf, and anatomical reconstruction of the entire defect. The traditional approach exposes the orbital floor, but it is difficult to see the posterior edge of the fracture and the condition of the herniated tissue before and after reduction of the orbital contents. Posterior dissection is the most difficult maneuver and is a common reason for failure of orbital floor repair.[3]

Transmaxillary endoscopic visualization of the orbital floor offers an excellent view of the entire defect and the surgical reconstruction.[4]

Several alternate materials used to support the orbital floor in the maxillary sinus via a transantral approach, include hydroxyapatite block, collagen membranes, silicone block, and balloon and gauze soaked with iodine formaldehyde. Potential problems with these methods are instability, implant displacement, inadequate reduction, infection, as well as cost.

REVIEW OF LITERATURE

Thorough knowledge of anatomy with topographical variants is of paramount importance to the surgeon in his everyday management of post-traumatic lesions of the orbit and peri-ocular area for optimal results. [6]

A-The bony orbit:

The orbits are paired structures, located on the anterior part of the face. Morphologically, each orbit is a four sided pyramid with a posterior apex and anterior base. [7] the average dimensions of each orbit are 40 mm wide, 35 mm high and 40-50 mm deep. The angle between both lateral walls of both orbits is 90° and between the lateral and medial walls of the same side is 45. The medial walls are almost parallel to the sagittal plane. [8] There are seven bones forming each orbit: frontal, ethmoid, lacrimal, sphenoid, zygomatic, palatine, and maxilla (**fig. 1)**. [7]

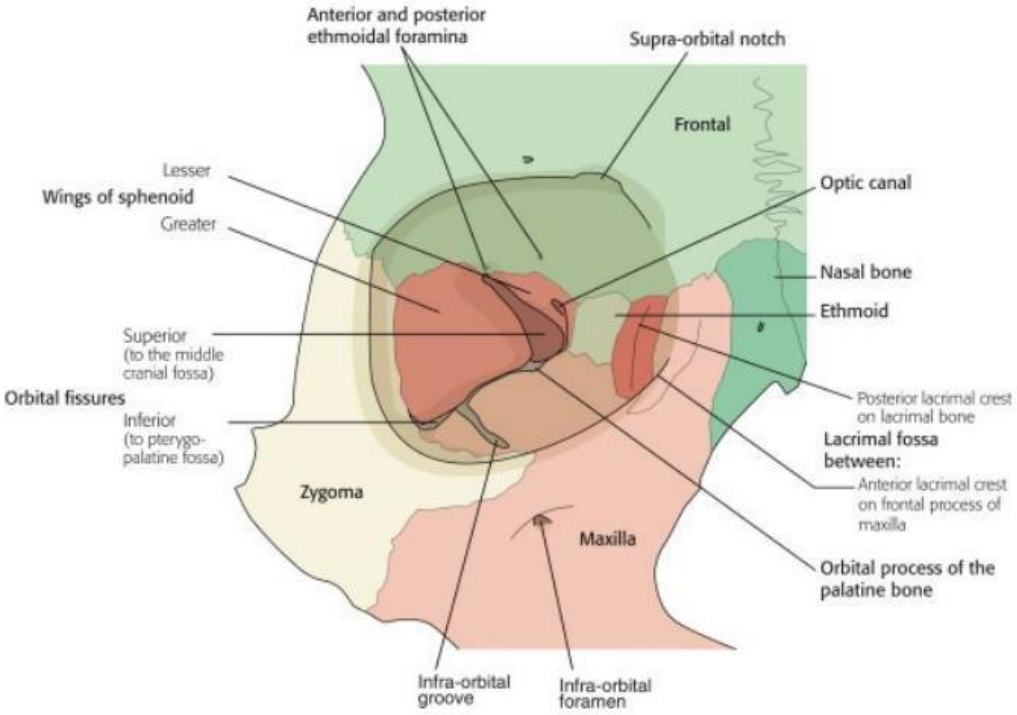

Fig. (1): **Diagrammatic illustration of the right bony orbit.** [9]

The orbital roof is the floor of the anterior cranial fossa and the frontal sinus and is formed by the orbital plate of the frontal bone. The orbital surface of the zygomatic bone and greater wing of the sphenoid constitute the lateral wall. The medial wall is made (from anterior to posterior) from the frontal process of the maxillary bone, the lacrimal bone and the lamina papyracea of the ethmoid bone with a small contribution by the lesser wing of the sphenoid. The floor is formed by the orbital surfaces of the zygomatic bone and maxilla, and minimally by the Palatine bone. The zygomatic, frontal and maxillary bones from the orbital margin. Medially the superior orbital rim ends of the spine of the lacrimal bone lying posterior to the inferior orbital margin, which ends of the spine of the maxillary bone. The fossa of the lacrimal sac is between these two spines. [10]

In general, the bone is thickest at the apex, thins as the walls diverge anteriorly, and then thickens again at the rims on the surface of the face. Although the bone of the medial orbital wall is thinnest, followed by the bone on the floor of the orbit, the medial wall is strengthened by the perpendicular septa of the ethmoid sinuses. The floor of the orbit is most vulnerable to fracture when there is a direct force exerted on the eye globe because it is thin and unsupported. [11,12]

None of the walls of the orbit are flat; they are curvilinear in shape, and their purpose is to maintain the projection of the globe and to cushion it when subjected to blunt force. [12]The orbital floor is almost triangular with rounded corners being narrower posterior. The floor is not horizontal but slopes upwards and medially at 45° and ascends posterior at about 30°, to terminate as the anterior margin of the inferior orbital fissure. At this point the bone curves abruptly downwards into the infra-temporal fuse to form the posterior wall of the maxillary antrum. [13] Recreating this gentle curvature when repairing orbital floor fractures is important to restore normal anatomy and to prevent postoperative enophthalmos or proptosis.[11, 13]