Orbital Volume Restoration Surgery of the Inferomedial Blow-out Fracture

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Nothing to Disclose
Inferior-medial Blow Out Fracture

- Fracture of the orbit wall & Intra-orbital contents pushed out into ethmoid & maxillary sinus.

- Extensive fracture with Large defect: risk of implant re herniation & dislocation
Purpose

• Compare the orbital volume ratio between orbital volume restoration procedure group vs. without volume restoring procedure group
Material & Methods

- pure Inferomedial Blow out fracture
- Patients : 30
- Mean age : 33.4 yrs
- Follow up period – more than 1 year
Material & Methods

• Group A (n=15)
  : without volume restoration procedure

• Group B (n=15)
  : orbital volume restoring surgery
Dual surgical approaches

1. Transconjunctival approach to orbital cavity
2. Transnasal restoration of orbital wall from ethmoid & maxillary sinus without endoscope
Transnasal restoration of orbital wall

Medial wall restoration
from **Ethmoid sinus**
- straight freer elevator

Inferior wall restoration
from **Maxillary ostium**
- curved freer elevator
Surgical procedures

Restored medial wall was supported with Ethmoid sinus packing - with Nasopore®
(Biodegradable fragmentable foam)
Surgical procedures

Restored Inferior wall was supported by

- Foley catheter ballooning in maxillary sinus
Evaluation methods

- **Hertel exophthalmometry**: 12 months
- **Pre- & Post-Op CT scan**: 6 months
- **Orbital volume measurements with CT**
  
  \[ \sum \text{area(slice}_n+\text{slice}_{n+1}) \div 2 \times \text{thickness (2.5mm)} \]
Orbital volume restoring surgery group _ volume measurement

Pre – OP

Post – OP

6 months
Results

• changes in **Orbital Volume**
  – Group A: 3.66 %
  – Group B: 11.49 %

  \( p < 0.05 \)

• changes in **Hertel scale**
  – Group A: 0.20 mm
  – Group B: 0.23 mm

  \( p > 0.05 \)
## Results

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Unaffected orbit</th>
<th>Affected orbit</th>
<th>Volume change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pre-OP</td>
<td>Post-OP</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Volume change</td>
</tr>
<tr>
<td>Group A</td>
<td>15</td>
<td>21.96</td>
<td>26.31/119.93</td>
<td>25.51/116.27</td>
</tr>
<tr>
<td>Group B</td>
<td>15</td>
<td>20.89</td>
<td>25.07/121.46</td>
<td>22.78/109.97</td>
</tr>
<tr>
<td>A – B</td>
<td></td>
<td>1.07</td>
<td>1.24 / -1.53</td>
<td>2.73 / 6.30</td>
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</tbody>
</table>
Conclusions

• Orbital volume restoration surgery can be considered as a useful method to restoring the fractured orbital wall to the prior position & restoring the original orbital volume in Inferomedial Blow out fractures.
Significance of the Findings

• pre- & post- operative

Orbital volume measurement can be a new surgical guideline in blow out fracture surgery.