

Orbital Volume Restoration Surgery of the Inferomedial Blow-out Fracture

Department of Plastic and Reconstructive Surgery,
College of Medicine, Dankook University
Cheonan, Republic of Korea

Dong Hee Kang, M.D., Ph.D., Jae Ho Aum, M.D.

Nothing to Disclose

Inferiomedial Blow Out Fracture

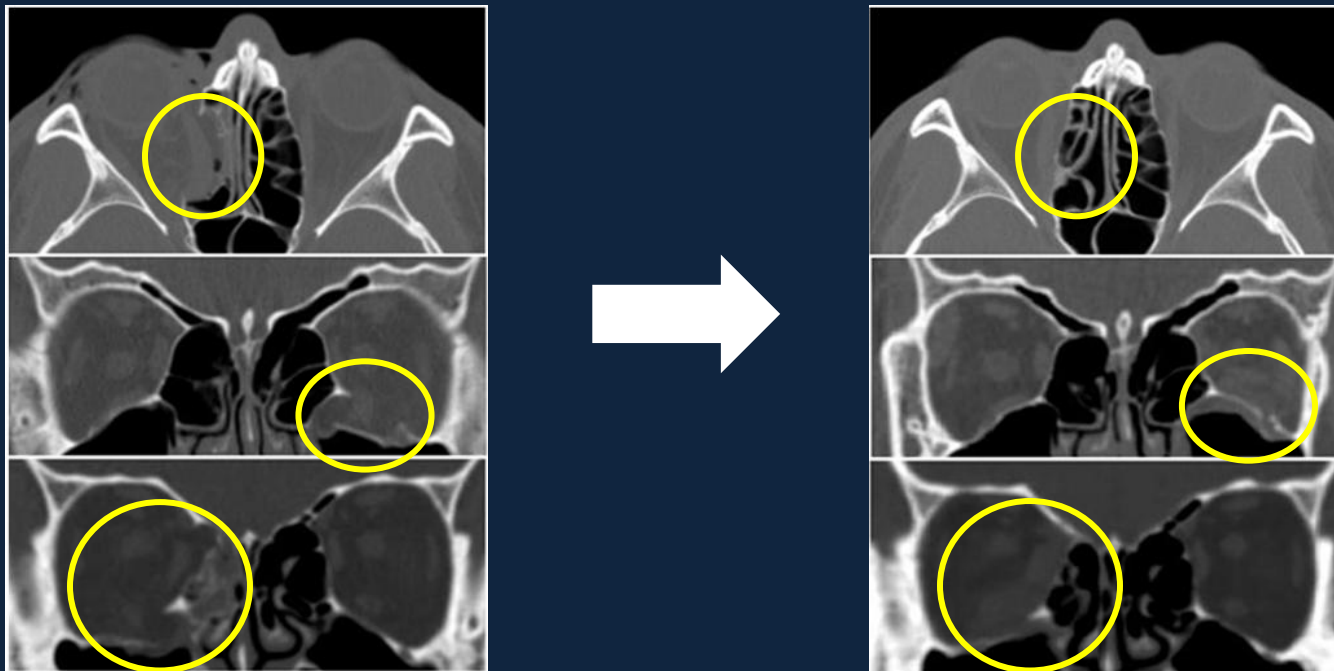
→ Fracture of the orbit wall
& Intra-orbital contents pushed out
Into ethmoid & maxillary sinus.

→ Extensive fracture with Large
defect

: risk of implant reherniation &
dislocation

Purpose

- Compare the orbital volume ratio between **orbital volume restoration procedure group** vs. **without volume restoring procedure group**



Material & Methods

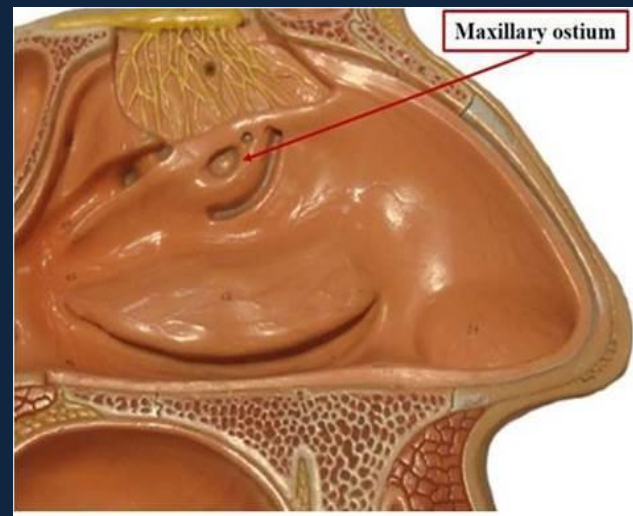
- Mar. 2007 – Aug. 2012
- **pure Inferomedial** Blow out fracture
- Patients : 30
- Mean age : 33.4 yrs
- Follow up period – more than **1 year**

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



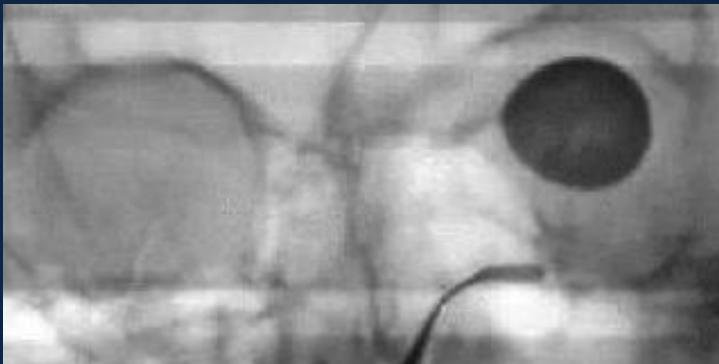
Transnasal restoration of orbital wall

Medial wall restoration



from **Ethmoid sinus**
- straight freer elevator

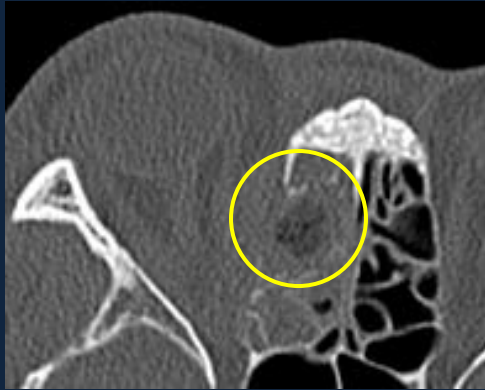
Inferior wall restoration



from **Maxillary ostium**
- curved freer elevator

Surgical procedures

Restored medial wall was supported with



Ethmoid sinus packing

- with **Nasopore[®]**

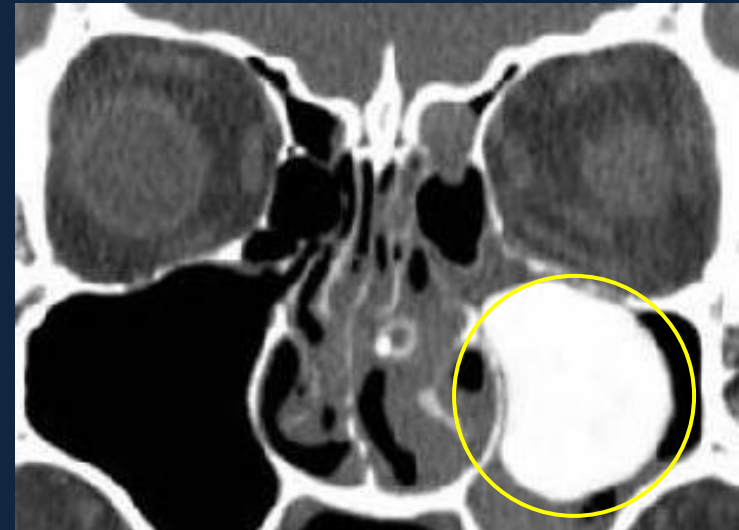
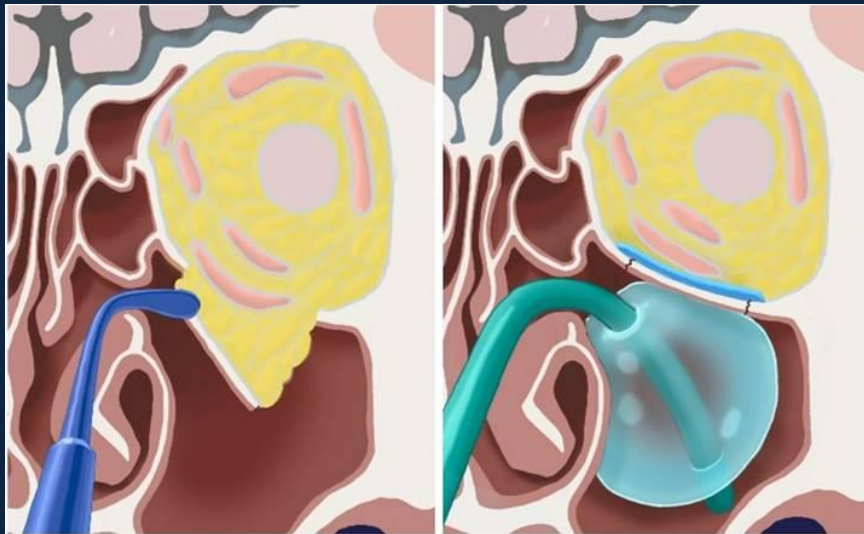
(Biodegradable fragmentable foam)



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
= $\sum \text{area}(\text{slice}_n + \text{slice}_{n+1}) \div 2 \times \text{thickness}$
(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

Orbital Volume (cm³) / (%)

	N	Unaffected orbit	Affected orbit		Volume change
			Pre-OP	Post-OP	
Group A	15	21.96	26.31/ 119.93	25.51/ 116.27	0.80 / 3.66
Group B	15	20.89	25.07/ 121.46	22.78/ 109.97	2.28 / 11.49
A – B		1.07	1.24 / -1.53	2.73 / 6.30	-1.48 / -7.83

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.