ZYGOMATIC COMPLEX FRACTURES

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Objective

The objective is to understand the etiology of ZMC fractures and to know about the various classifications and to understand the radiographic assessment.

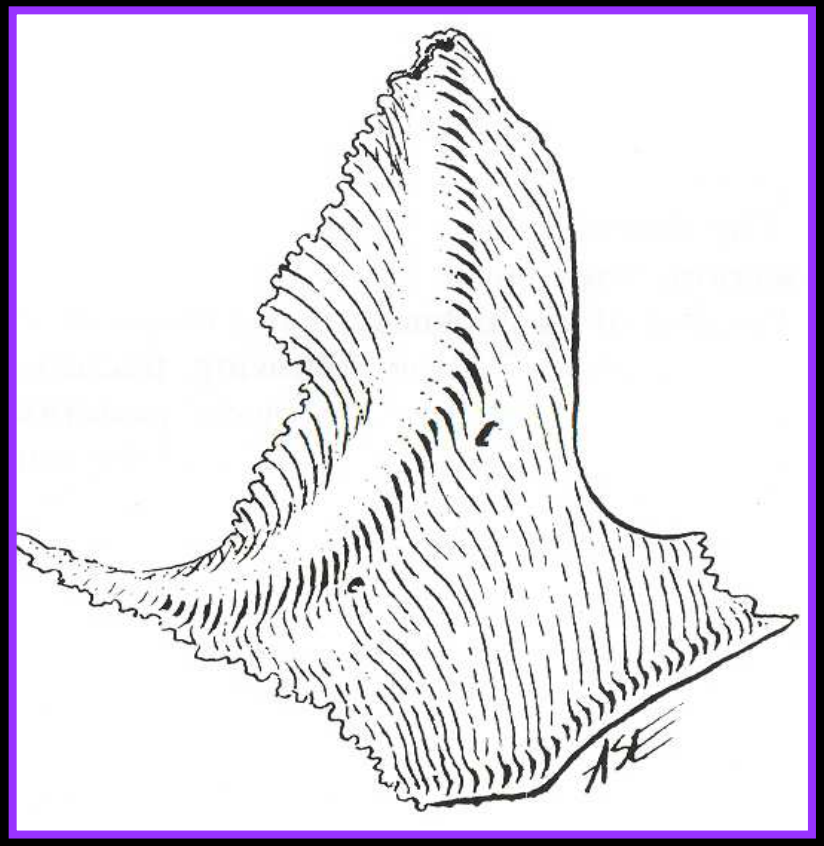
INTRODUCTION

"So closely do the fractures depend for their form, upon their bony supports, that the loss of even a very small portion of bone of the facial bones will generally entail a great disfigurement".

- J. Ashurst 1864

- *Common facial fractures .*
- *Second in frequency after nasal fractures.*
- *Prominent position within the facial skeleton,*
- *Exposes it to traumatic forces.*

OSTEOLOGY



- Major buttress.
- Principle structure of lateral midface.
- Thick strong bone.
- Quadrilateral
- Outer surface -convex and inner surface-concave.

PROCESSES

FRONTAL

TEMPORAL

MAXILLARY

FUNCTIONS OF THE ZYGOMATIC BONE :

- Protect the globe of the eye
- Gives origin to the masseter muscle
- Transmit part of the masticatory forces to the cranium.
- Absorb forces of an impact before it reaches brain.

ETIOLOGY

Altercation, 46%.

Falls, 22.4%

Motor Vehicle Accidents, 13.3%

Left Zygoma, affected most

Bilateral Zygoma #, rare-4%.

Male predilection with a ratio of approximately 4:1 over females.

Second and third decades of life.

TERMINOLOGY

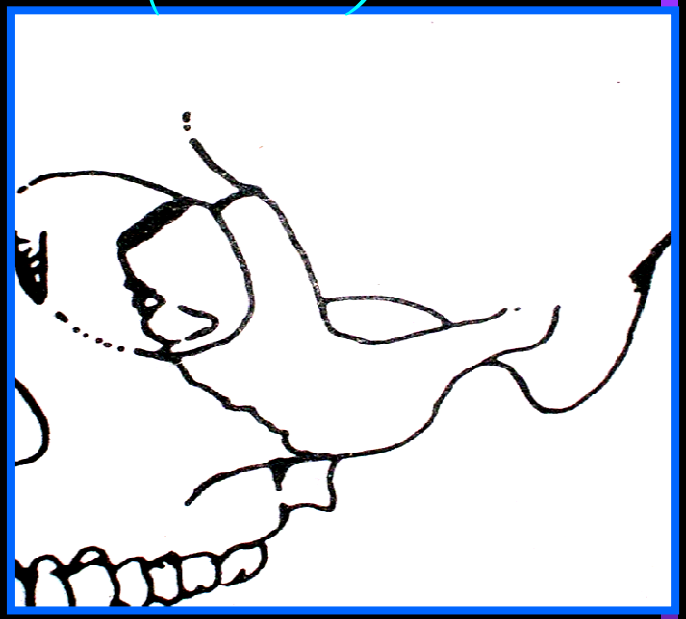
- Zygomatic / malar fracture - commonly used.
- Other terms have been adopted
  - Zygomaticomaxillary complex,
  - Zygomaticomaxillary compound,
  - Zygomaticoorbital,
  - Zygomatic complex,
  - Malars, and
  - Tripod fracture .

- *The latter two terms – misnomers*
- *The term Zygomatic / Zygomaticomaxillary complex helps distinguish fractures that involve the zygoma and adjacent bones from isolated zygomatic arch fractures, and they are used when distinction is necessary.*

CLASSIFICATION

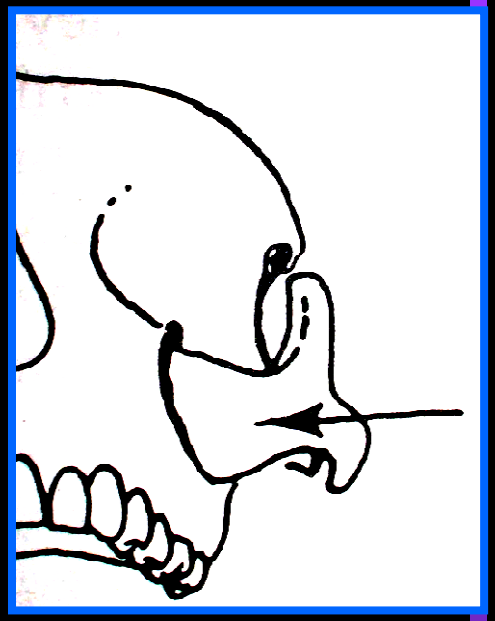
Knight and North Classification(1961)

- Group I : Undisplaced fractures

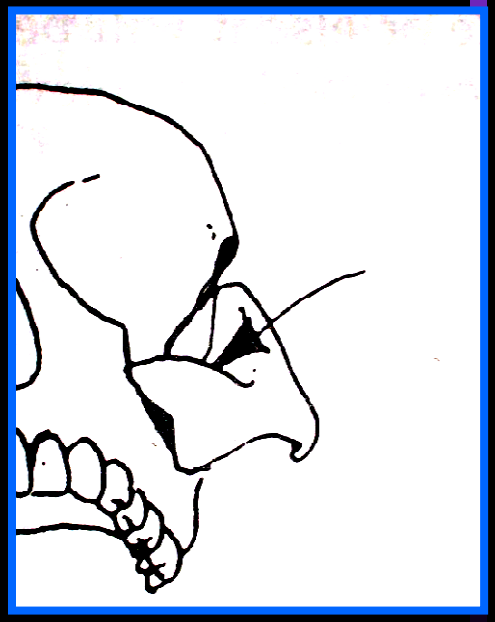


- Group II : Arch fractures.

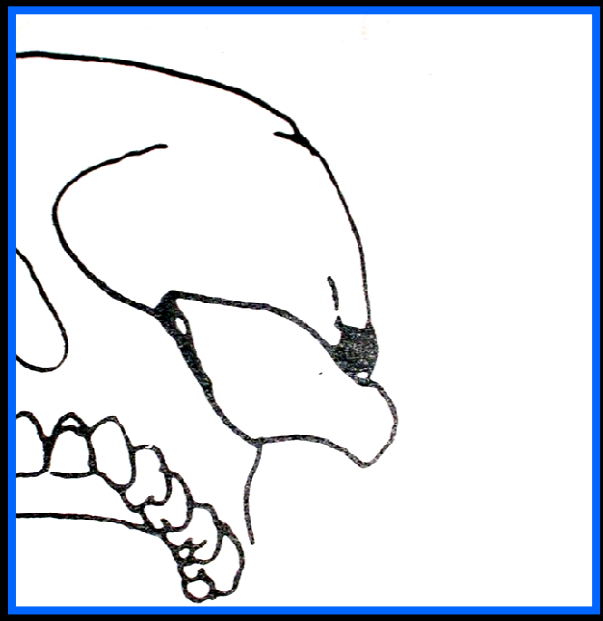
- *Group III : Unrotated body fractures*



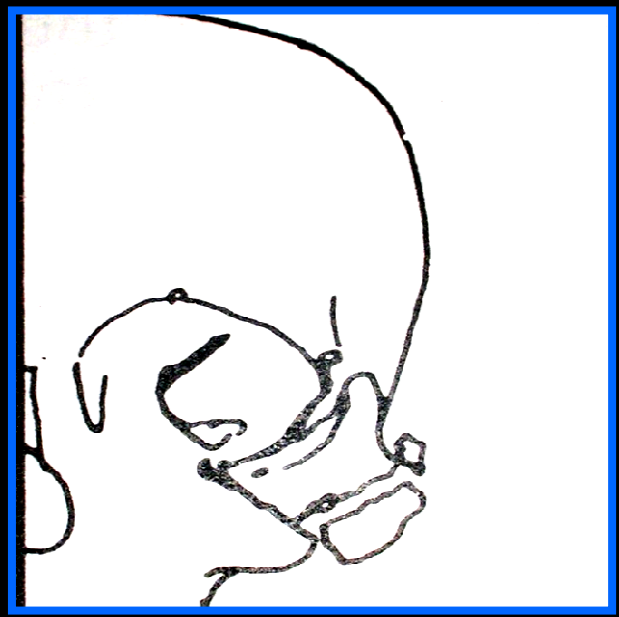
- *Group IV : Medially rotated body fractures.*



- *Group V : Laterally rotated body fractures.*

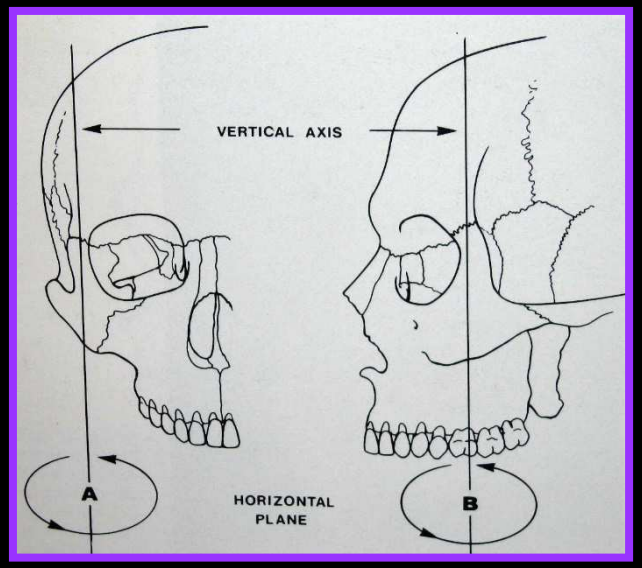


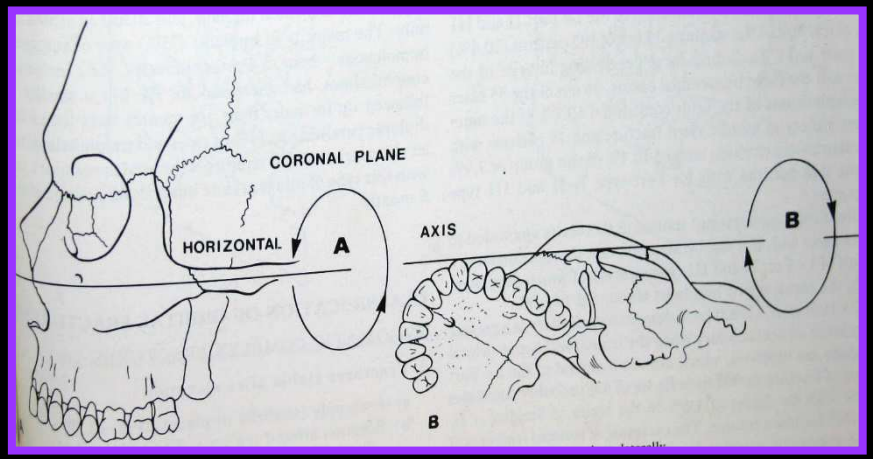
- *Group VI : Complex fractures.*



FRACTURE PATTERNS ALONG THE IMAGINARY AXES

- Along the vertical axis in Horizontal plane
  - stable #s
- Along the Longitudinal Axis in coronal plane
  - Unstable #s





ROWE AND KILLEY'S

- TYPE 1 : No significant displacement
- TYPE 2 : Isolated fractures of zygomatic arch
- TYPE 3 : Fractured and rotated along the vertical axis
- TYPE 4 : Fractured and rotated along the longitudinal axis

- *TYPE 5 : Fracture displacement of the complex enbloc*
- *TYPE 6 : Fracture displacement of the orbital floor*
- *TYPE 7 : Fracture displacement of the orbital rim segments*
- *TYPE 8 : Complex , comminuted fracture.*

ROWE'S CLASSIFICATION

1) Fractures stable after elevation

Arch only (medially displaced)

Rotation around the vertical axis.

Medially

Laterally

2) Fractures unstable after elevation.

Arch only (inferiorly displaced).

Rotation around the horizontal axis.

Medially

Laterally

Dislocations enbloc

Inferior

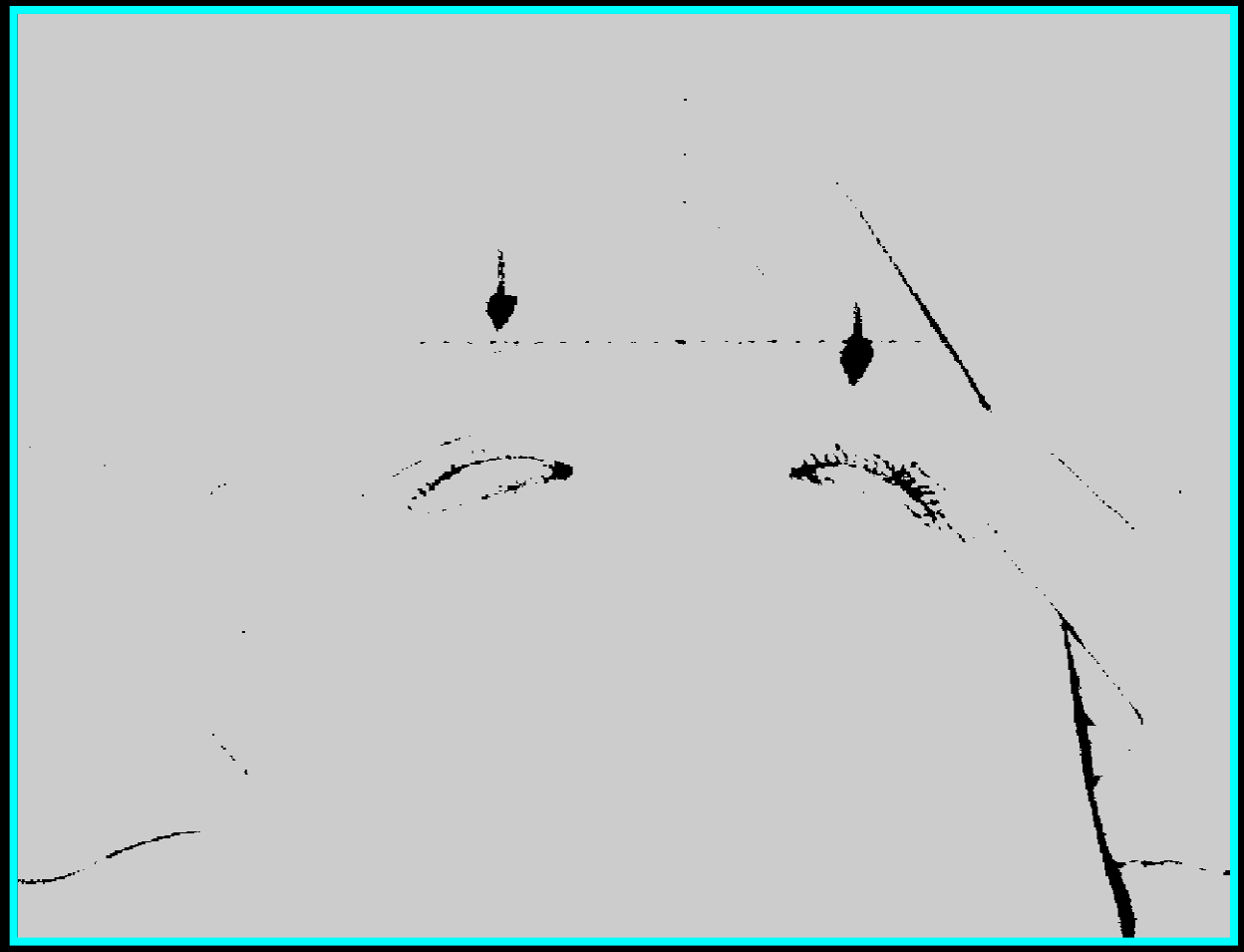
Medially

Postero-laterally.

DIAGNOSIS OF ZYGOMATICOMAXILLARY COMPLEX FRACTURES

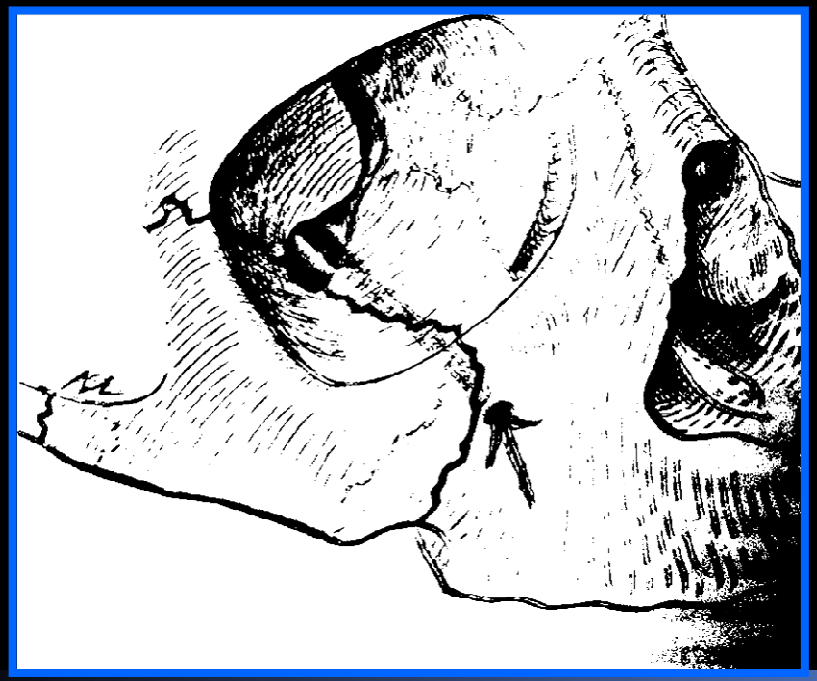
- *Clinical examination*
- *Signs and symptoms*
- *Radiographic examination*

INSPECTION AND PALPATION



- *CLINICAL SIGNS & SYMPTOMS:*
  - *Pain,*
  - *Periorbital ecchymosis and edema,*
  - *Flattening of Malar Prominence, (Cheek)*
  - *Notching or dimple at side of the face,*
  - *Deformity of Orbital margin,*
  - *Epistaxis*

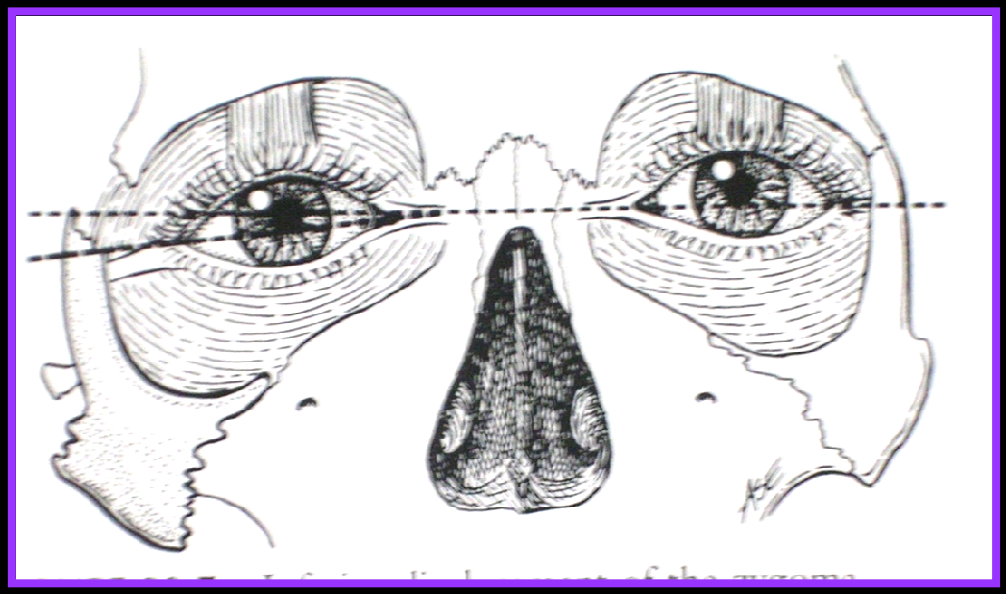
Trismus



Abnormal Nerve sensibility

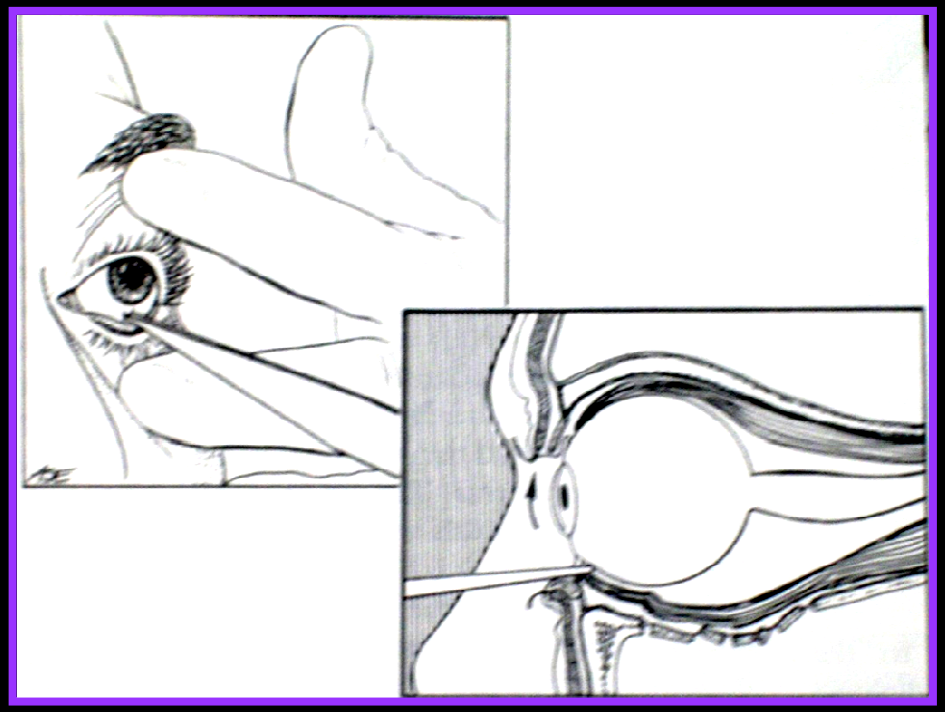
- *Subconjuctival Ecchymosis*

- *Crepitation from Air Emphysema,*
- *Unequal pupillary level (Dystopia)*
- *Displacement of palpebral tissue*
- *Enophthalmos*



- *Ecchymosis of maxillary buccal sulcus*
- *Deformity at maxillary buttress*

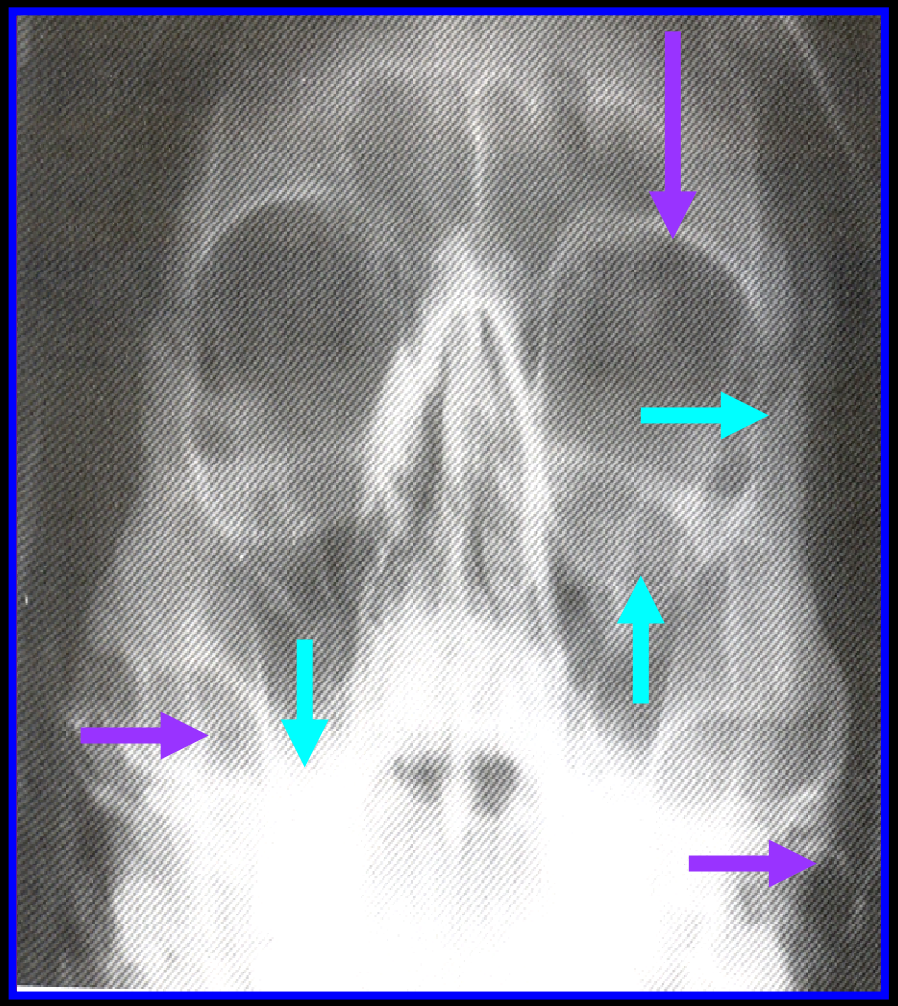
- *Diplopia*
  - *Forced Duction Test*



RADIOGRAPHIC EXAMINATION

- *Postero-anterior oblique view (OM, PNS view):*

  – *excellent assessment of sinuses and their walls, zygoma and its processes and rims of orbit*



Normal P-A oblique (waters view)

F-Z suture

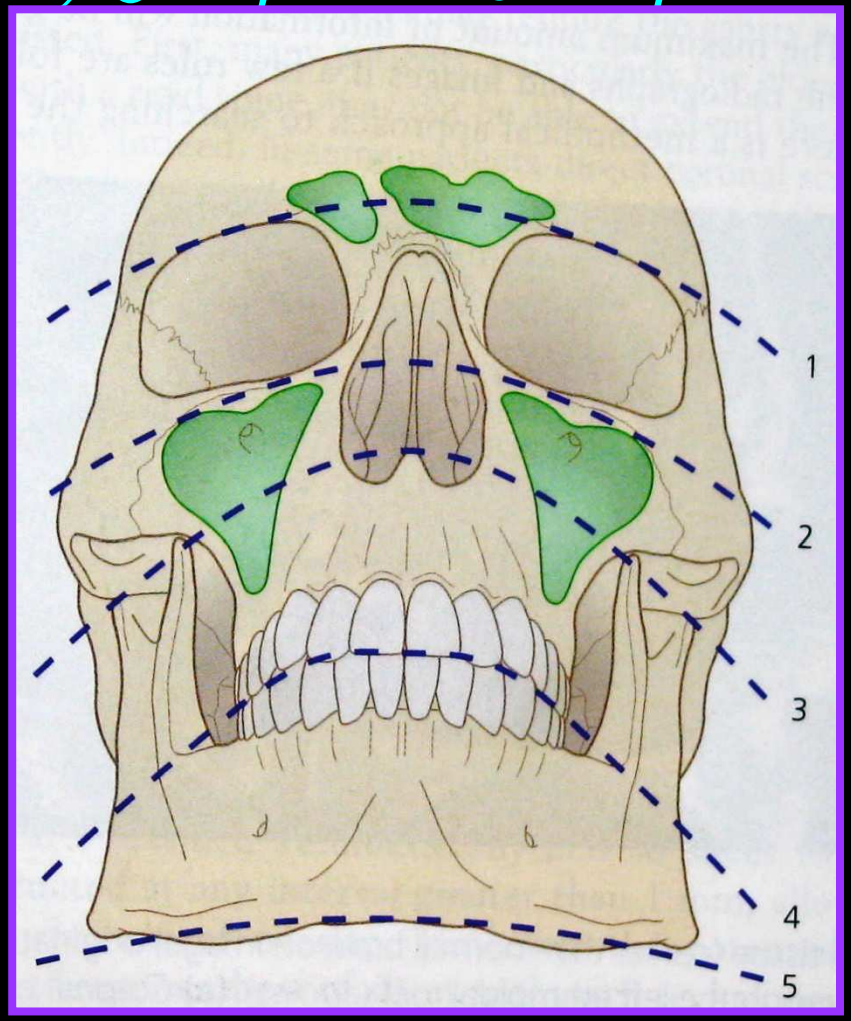
Lateral maxillary wall

Maxillary sinuses

Orbital wall.

Zygomatic arch.

McGregor, Campbell & Trapnell's lines

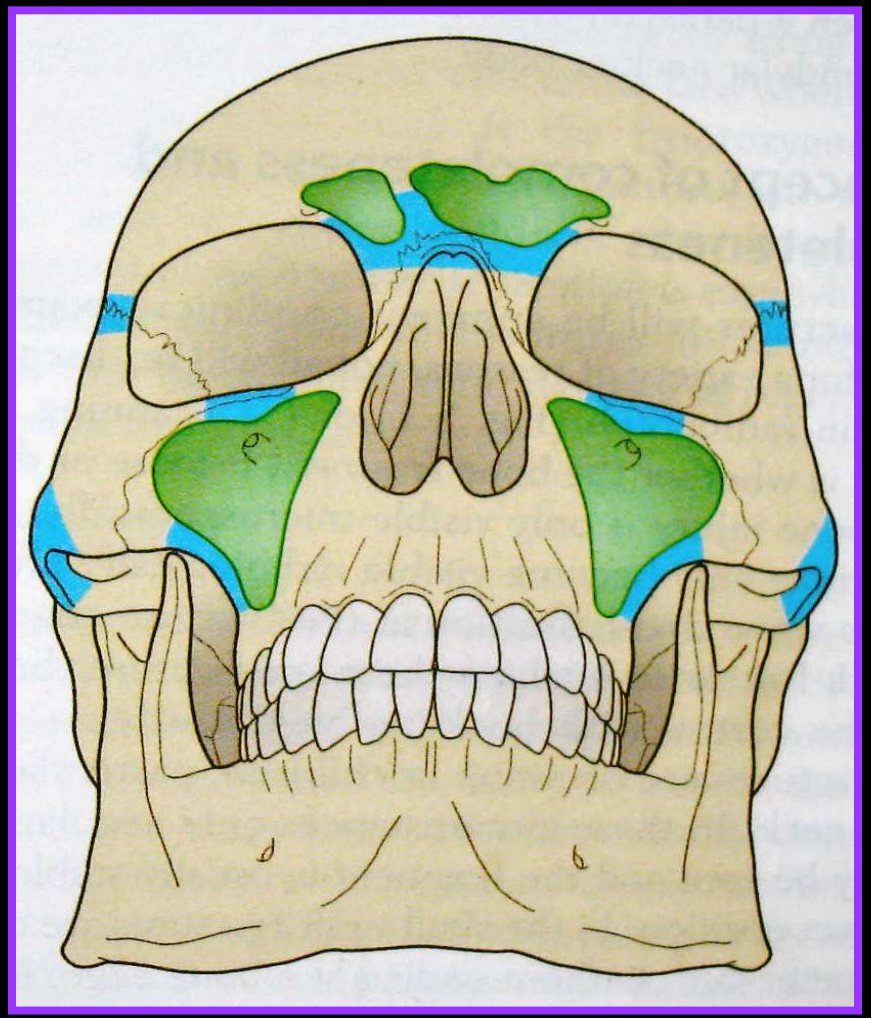


Search Patterns & Reminders

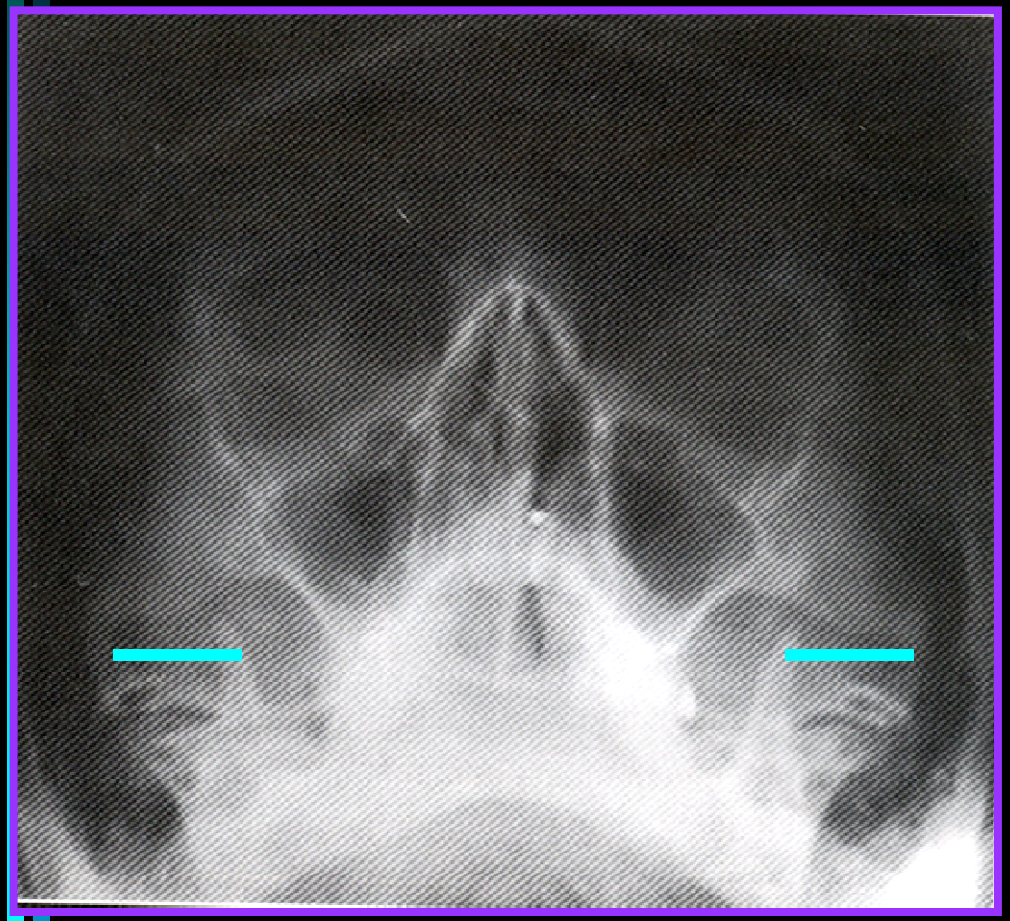
DESCRIPTION OF 4S 'S' BY DELBALSO;

- *Symmetry*
- *Sharpness*
- *Sinus and*
- *Soft tissues.*

'Hot sites' and fracture patterns



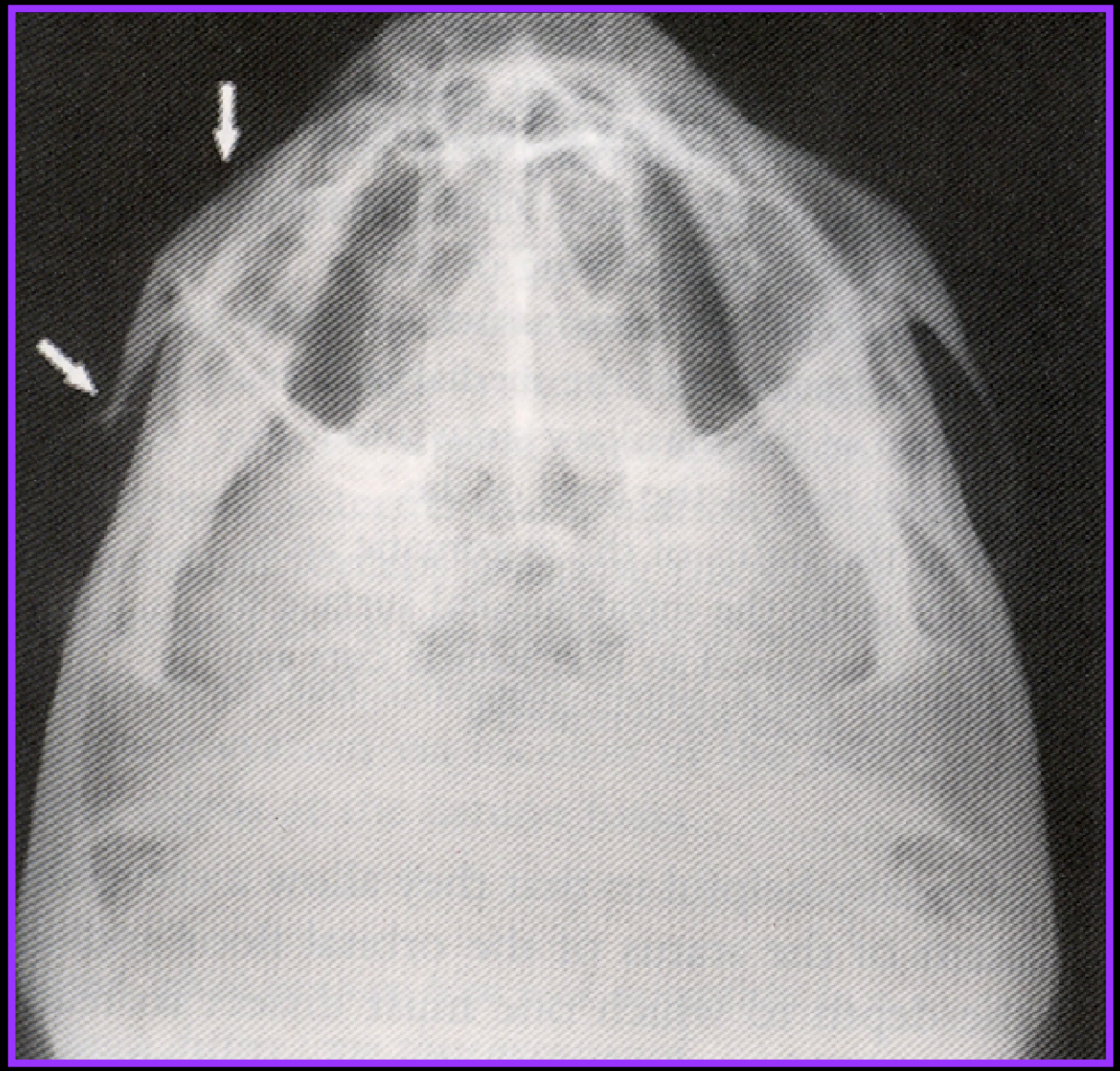
THE EXAGGERATED P-A OBLIQUE VIEW

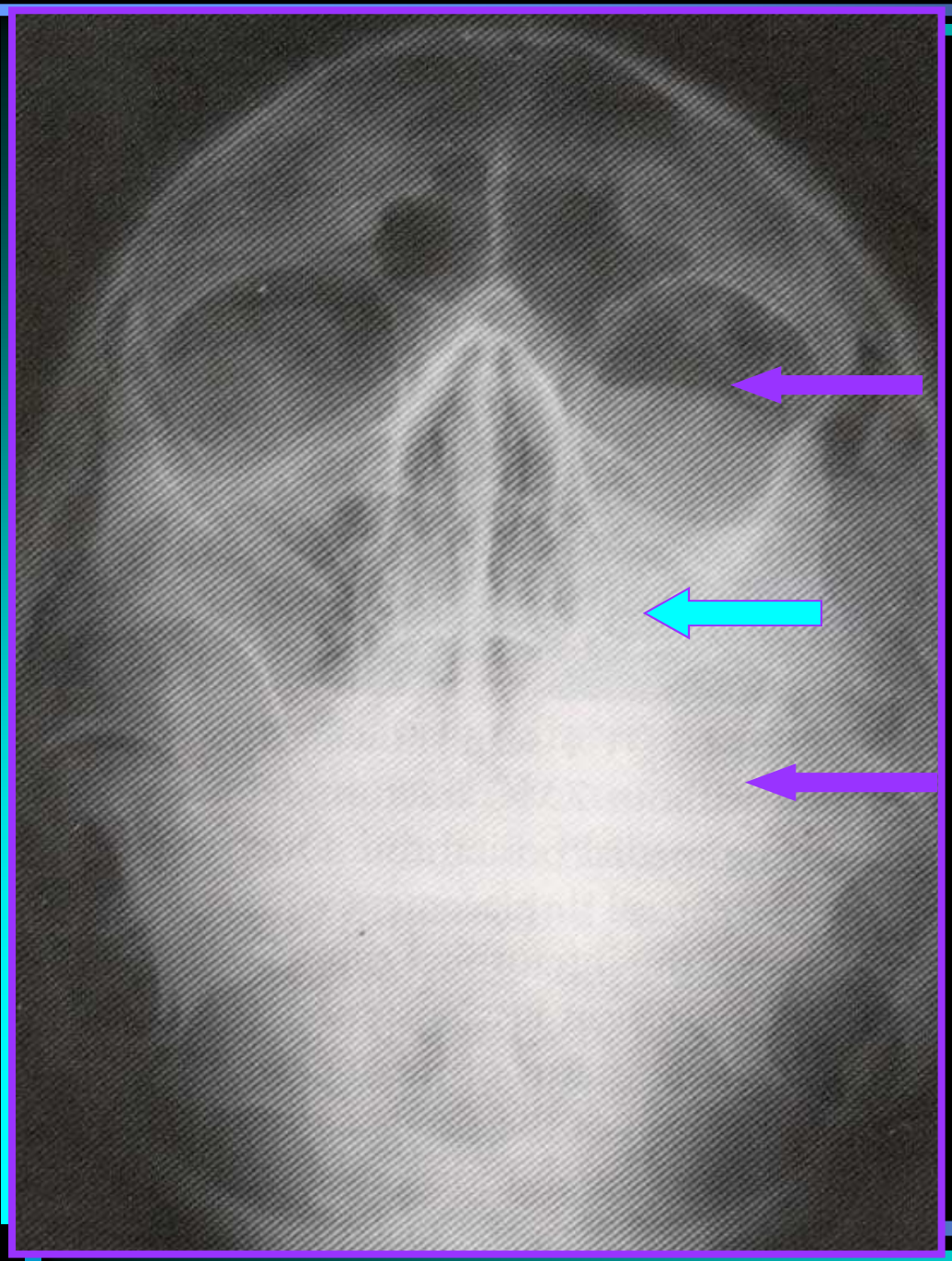


Allows for comparison of the distance between the zygomatic body and the coronoid processes.

The zygomatic arch are easily viewed

SUBMENTOVERTEX RADIOGRAPH.





Alteration in the shape and size of the left orbit.

Clouding of the left maxillary sinus.

Discontinuity in the left lateral maxilary wall.

CONCLUSION

Since the gross shape of the face is influenced largely by the underlying osseous structure, the zygoma plays an important role in facial contour. Disruption of zygomatic position also has great functional significance because it creates impairment of ocular and mandibular function. Therefore, for both cosmetic and functional reasons, it is imperative that zygomatic injuries be properly and fully diagnosed and adequately treated.

questions

- *Classify the ZMC fractures?*
- *Enumerate the clinical signs of ZMC Fractures?*
- *Describe the radiographs required for the ZMC Fractures?*

Multiple choice questions

- **All are the features of ZMC Fractures excepet:**

a. Absence of Pain

b. Periorbital ecchymosis and edema,

c. Flattening of Malar Prominence, (Cheek)

d. Notching or dimple at side of the face,

2. Fluid filled sinus is indicative of :

a. Lefort 1 fracture

b. ZMC Fracture

c. Mandible fracture

d. None

Assignment

- *Classify the ZMC fractures, Enumerate the clinical signs and describe the radiographs required for the same?*

REFERENCES

- *Oral and maxillofacial trauma – Raymond J. Fonseca*
- *Maxillofacial injuries - Rowe and Williams*
- *Oral and Maxillofacial Surgery, vol-III, Fonseca Series.*
- *Principles of Oral Maxillofacial Surgery, vol-1, Larry J. Peterson..*
- *JOMS, 1986, 283-83.*
- *JOMS, 1992, 50, 778-790.*
- *J.Cranio-Max-Fac-Surg 1990, 18, 359-60.*

video

- *https://www.youtube.com/watch?v=akv0Jhufp9c*