FRACTURES OF MIDDLE THIRD OF THE FACE-- INTRODUCTION

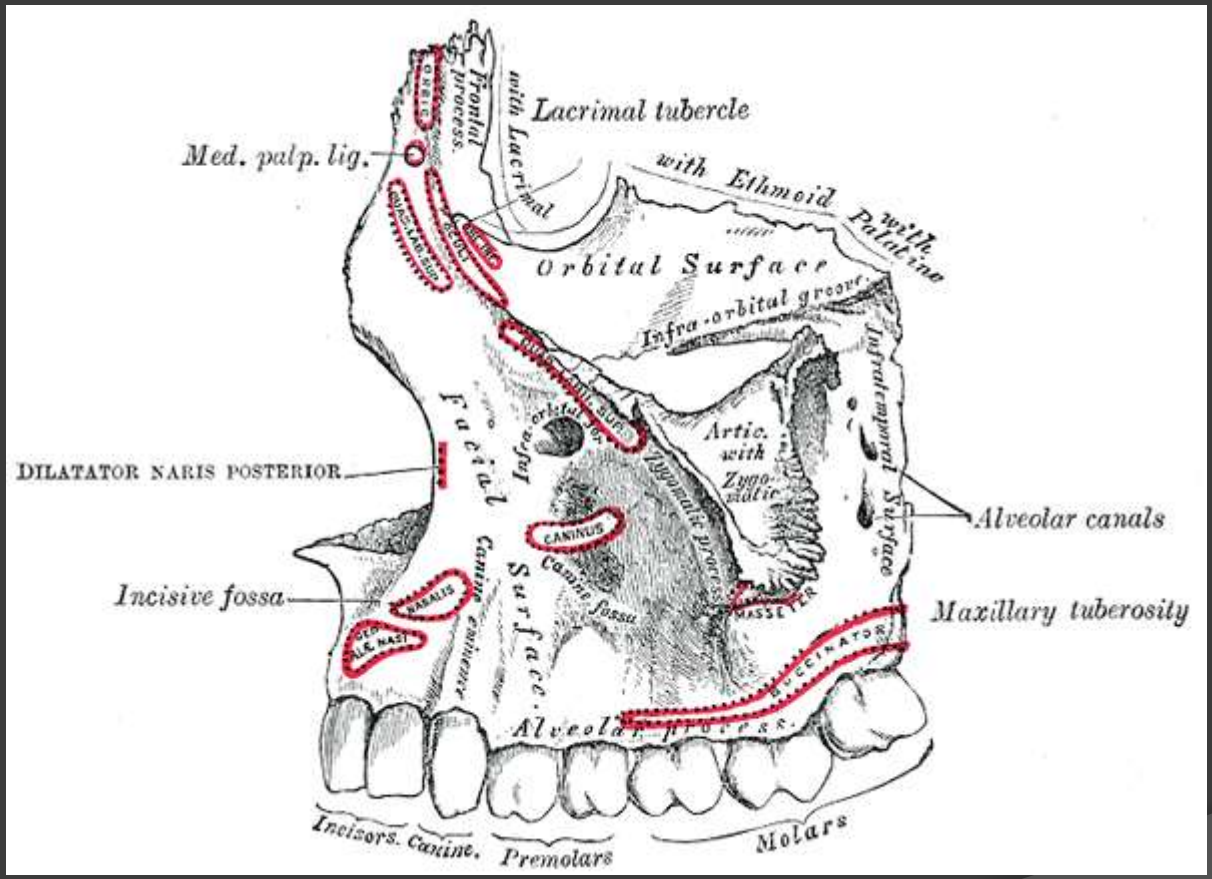
Middle third of the face

- It is the area bounded by a line drawn from the zygomaticofrontal suture across the frontonasal & frontomaxillary to the zygomaticofrontal suture on the opposite side.Inferiorly by the occlusal plane or the alveolar ridge and posteriorly as for as the frontal bone above and pterygoid process of sphenoid below.

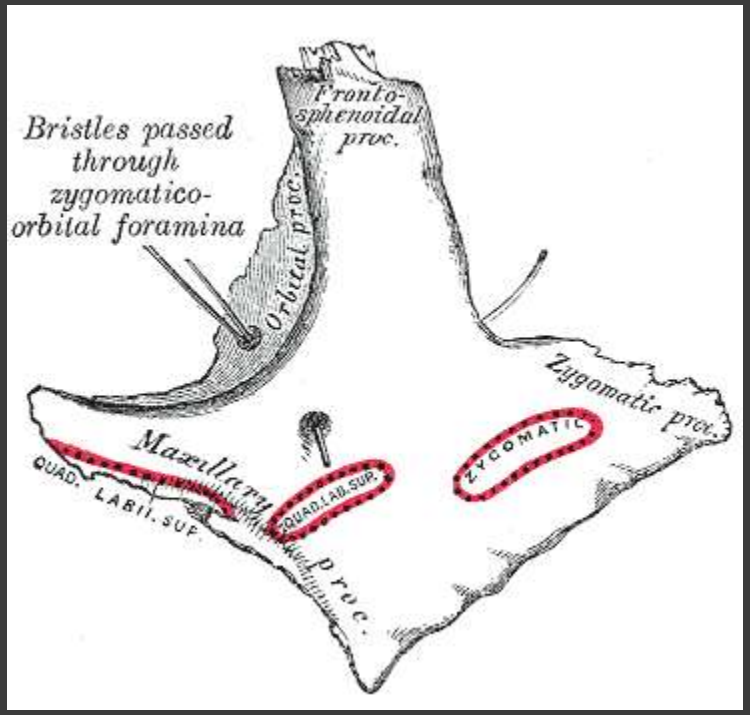
- It is composed of 2 maxillae,2 zy gomatic bones,2 palatine bones,2 zygomatic process of the temporal bones,2 nasal bones,2 lacrimal bones,1 vomer,ethmoid and pterigoid plates of sphenoid.

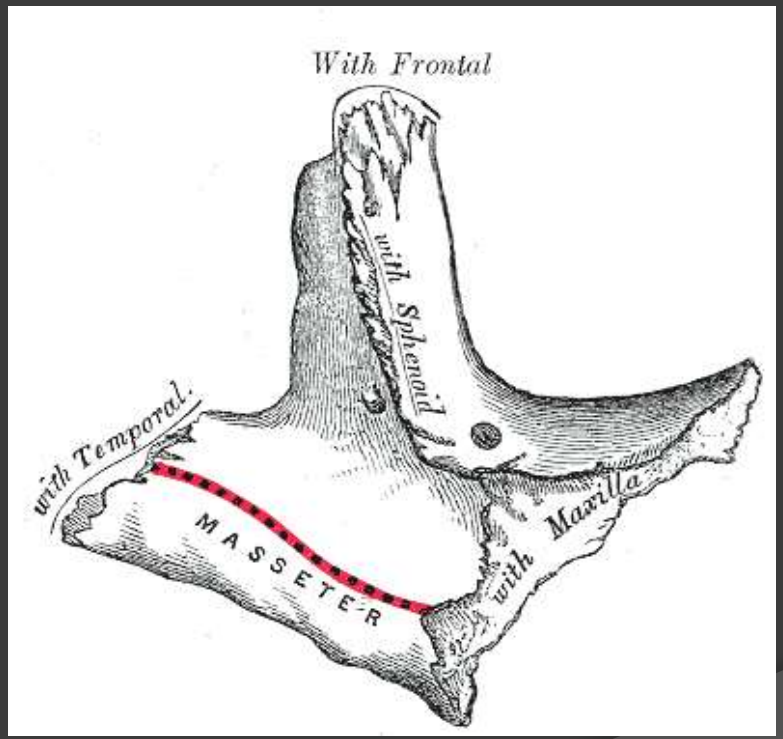
ANATOMY OF INDIVIDUAL BONES

MAXILLAE


Frontal process
with Lacrimal
Lacrimal tubercle
Med. palp. lig.
with Ethmoid
with Palatine
Orbital Surface
Infra-orbital groove
Infra-orbital foramen
Facial Surface
Artic. with Zygomatic
Infratemporal Surface
DILATATOR NARIS POSTERIOR
Alveolar canals
CANINUS
Canine fossa
Incisive fossa
Canine eminence
MASSETER
Maxillary tuberosity
BUCCINATOR
Alveolar process
Incisors.
Canine.
Premolars
Molars

ZYGOMATIC BONE





ETHMOID BONE

labyrinths, each of which extends downward *foramen caecum*. (For further details s

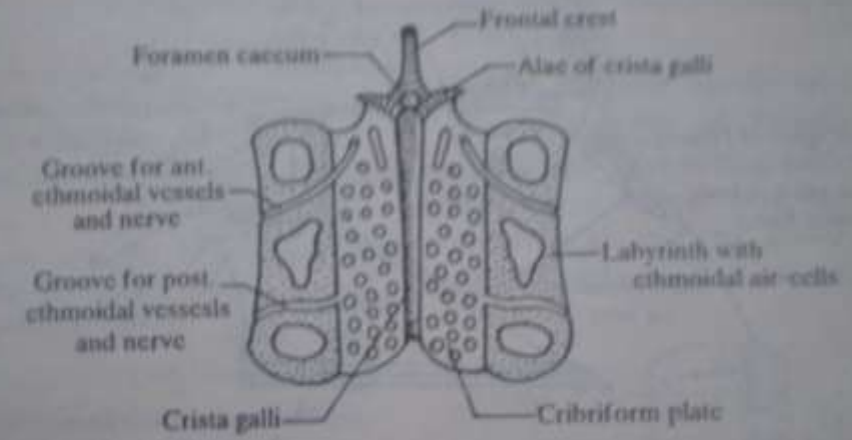
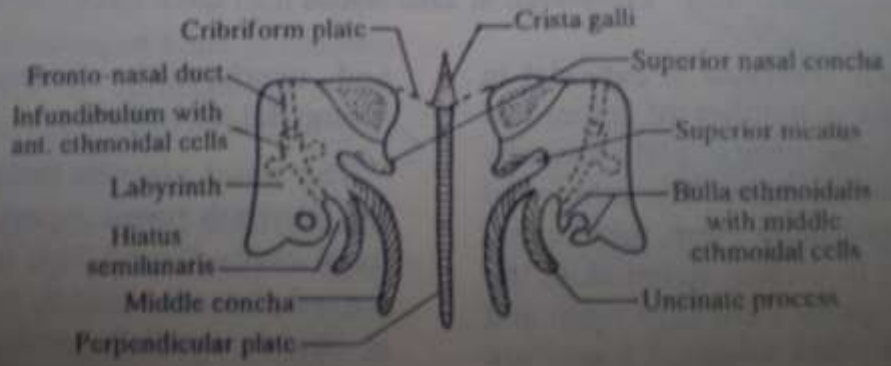
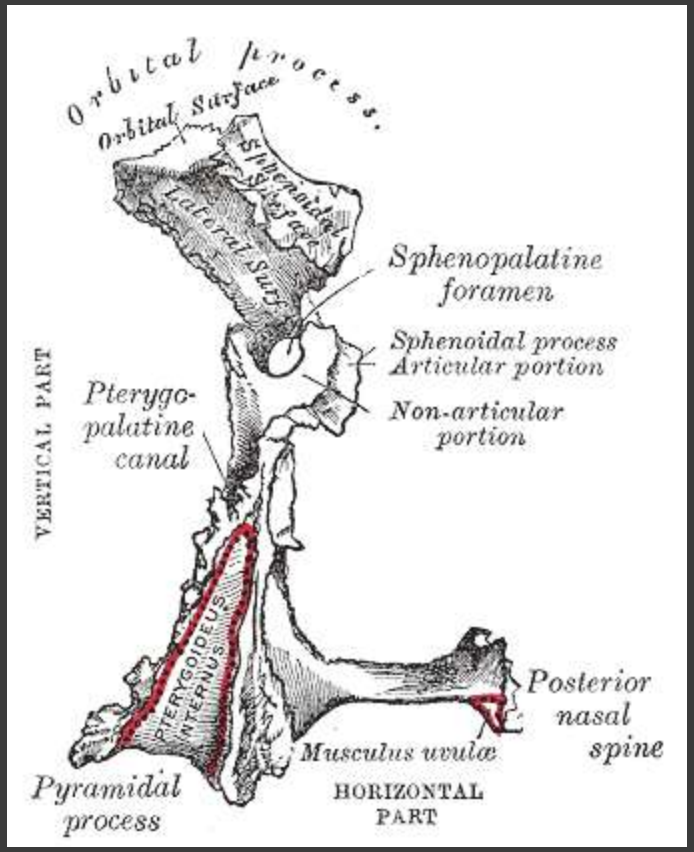


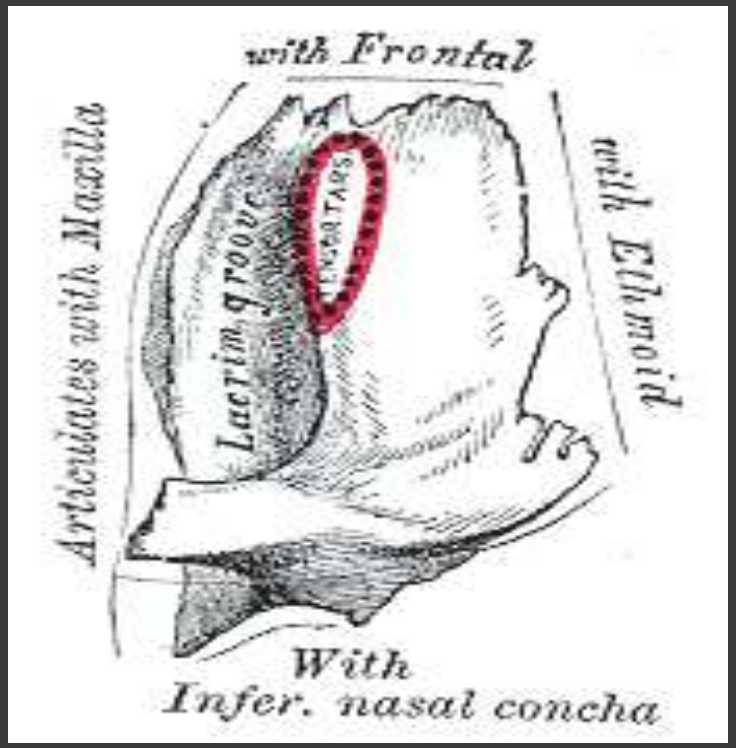
Fig. 1.25 - **Ethmoid bone** (viewed from above)



PALATINE BONE



LACRIMAL BONE



VOMER

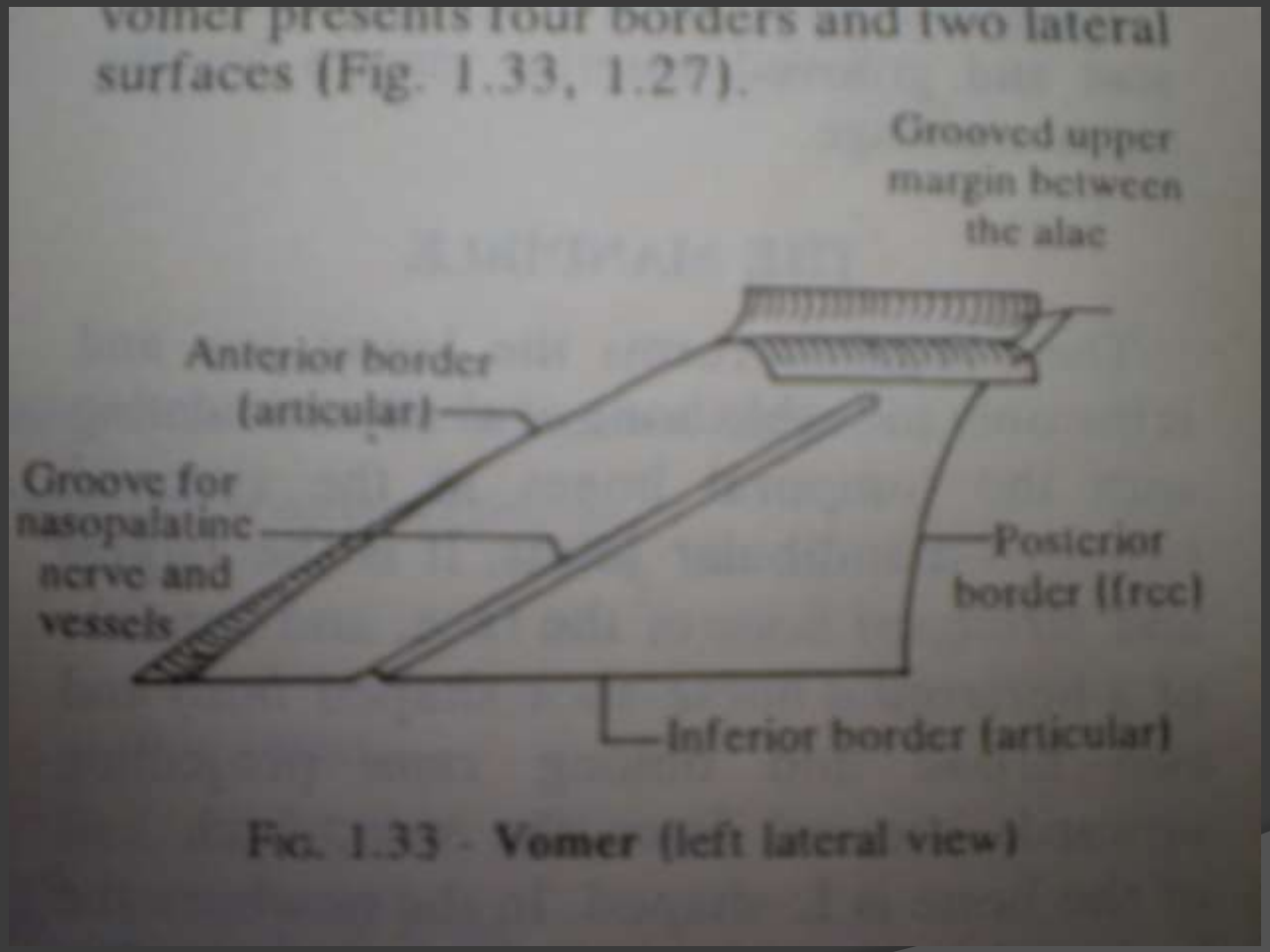
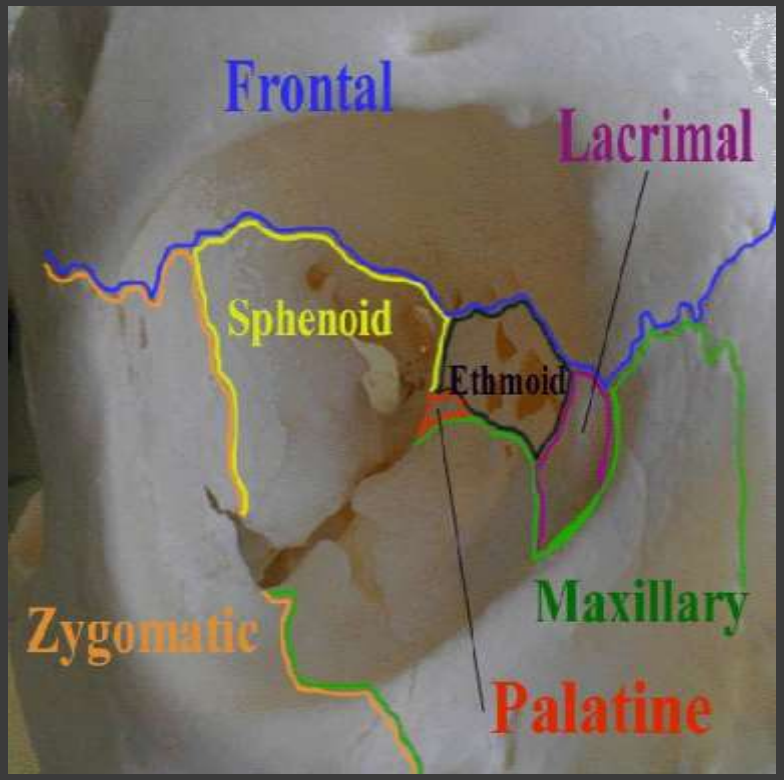
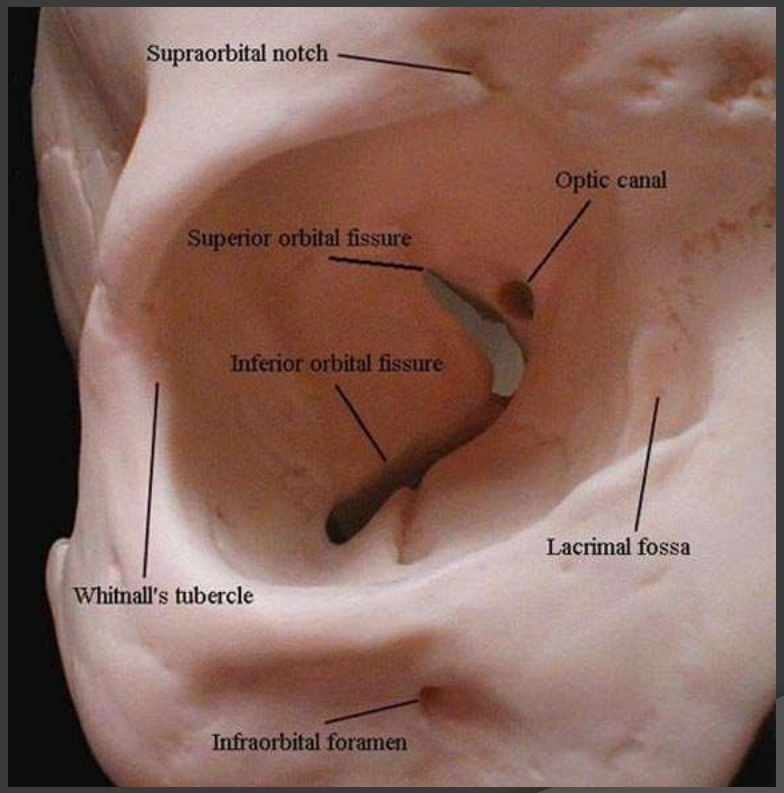


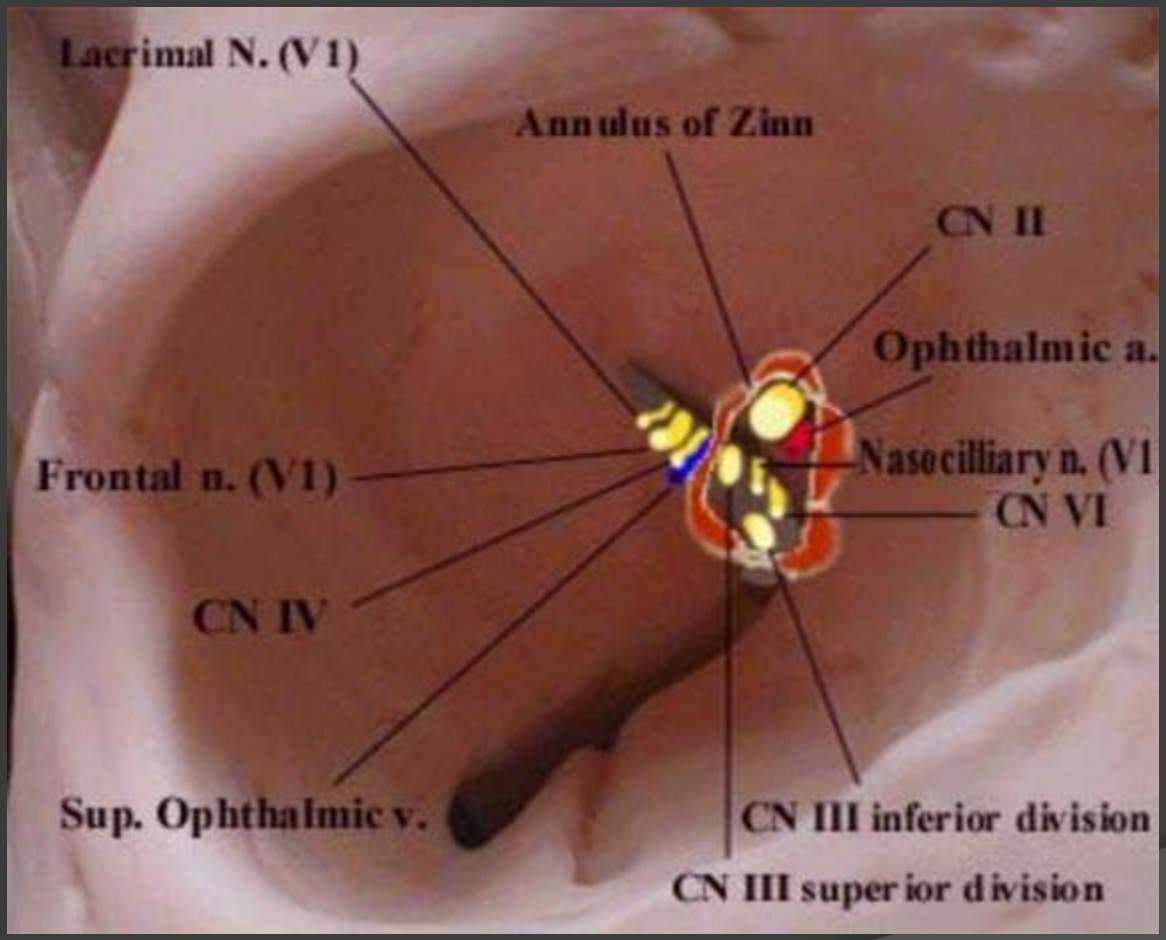
Fig. 1.33 - **Vomer** (left lateral view)

NASAL BONE

ORBIT


Frontal
Lacrimal
Sphenoid
Ethmoid
Maxillary
Zygomatic
Palatine

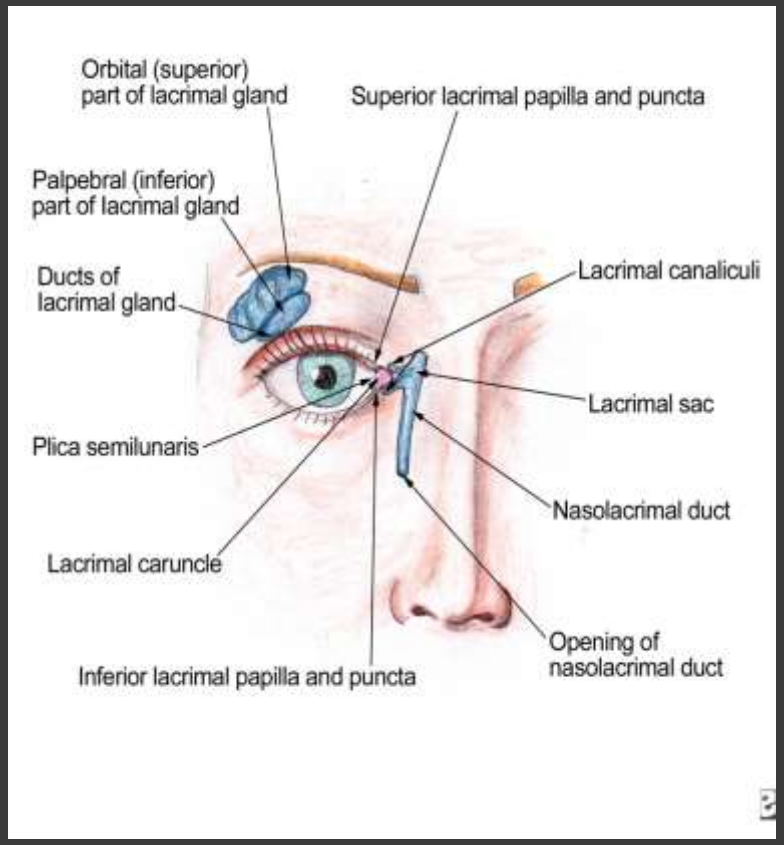

Supraorbital notch
Optic canal
Superior orbital fissure
Inferior orbital fissure
Lacrimal fossa
Whitnall's tubercle
Infraorbital foramen

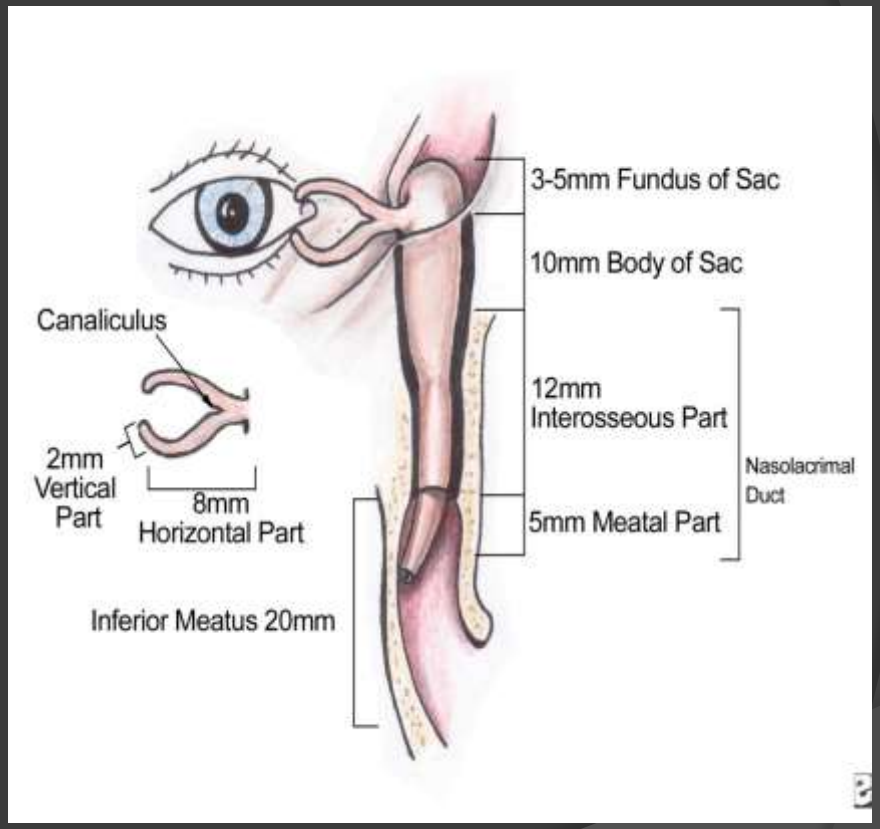

Lacrimal N. (V1)
Annulus of Zinn
CN II
Ophthalmic a.
Nasocilliary n. (V1
CN VI
Frontal n. (V1)
CN IV
Sup. Ophthalmic v.
CN III inferior division
CN III superior division

APPLIED ASPECTS

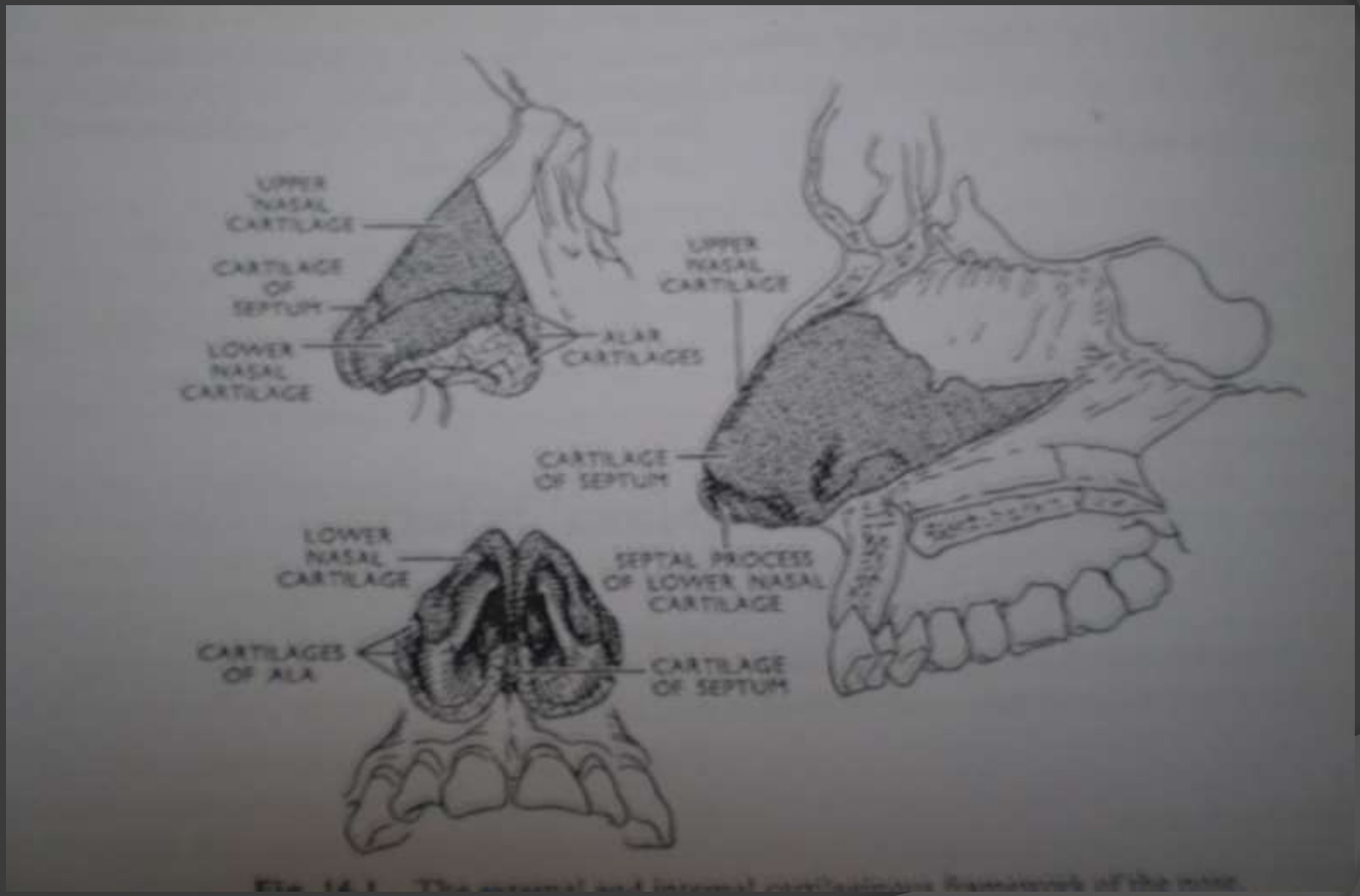
- Inf. Orb.foramen to the mid point of infra orbital fissure-24mm
- Ant.lacrimal crest to ant.ethm.foramen-24mm
- Ant.lacrimal crest to medial aspect of optic canal-42 mm
- Frontozygomatic suture to the superior orbital fissure-35mm
- Supra orb. Notch to the superior orbital fissure-40 mm
- Supra orb.notch to the superior aspect of optic canal -45 mm

LACRIMAL SYSTEM

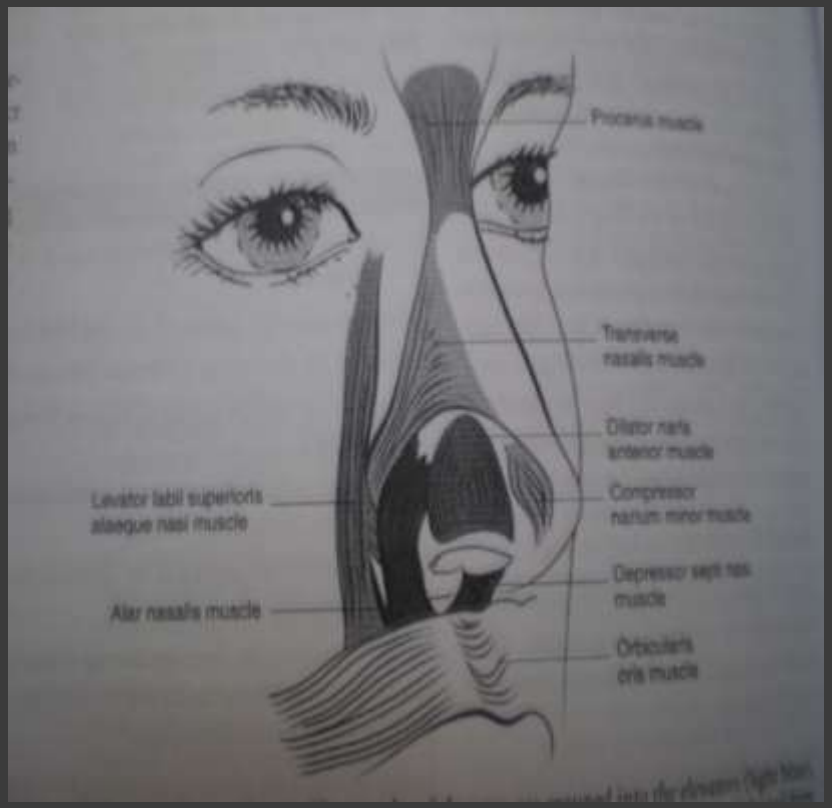


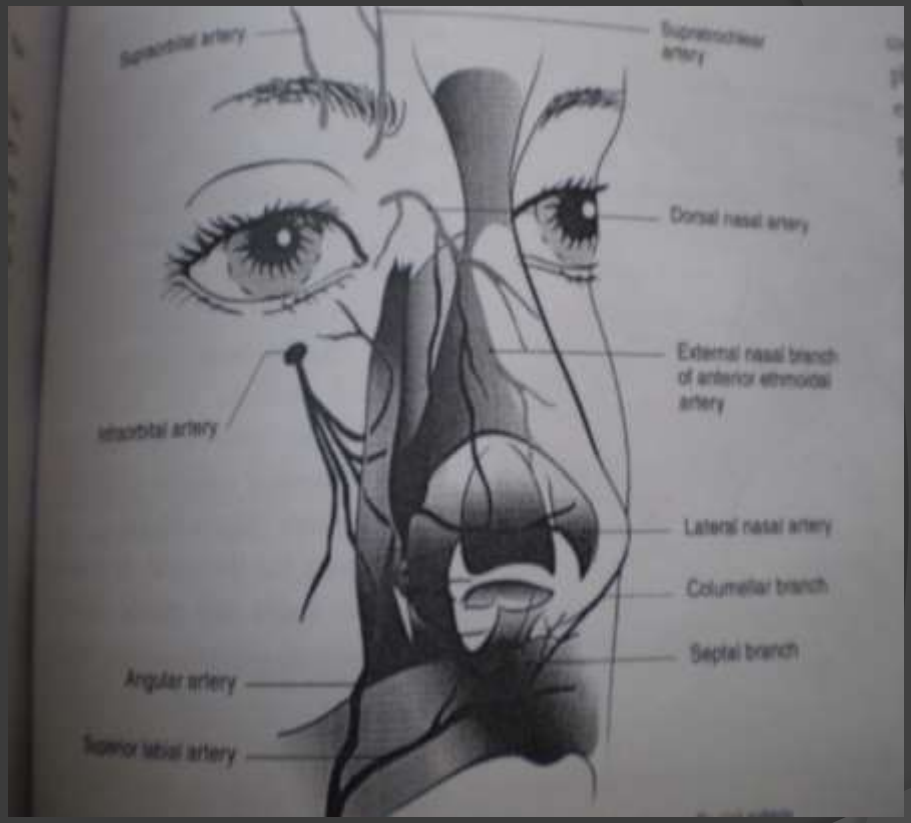


NOSE

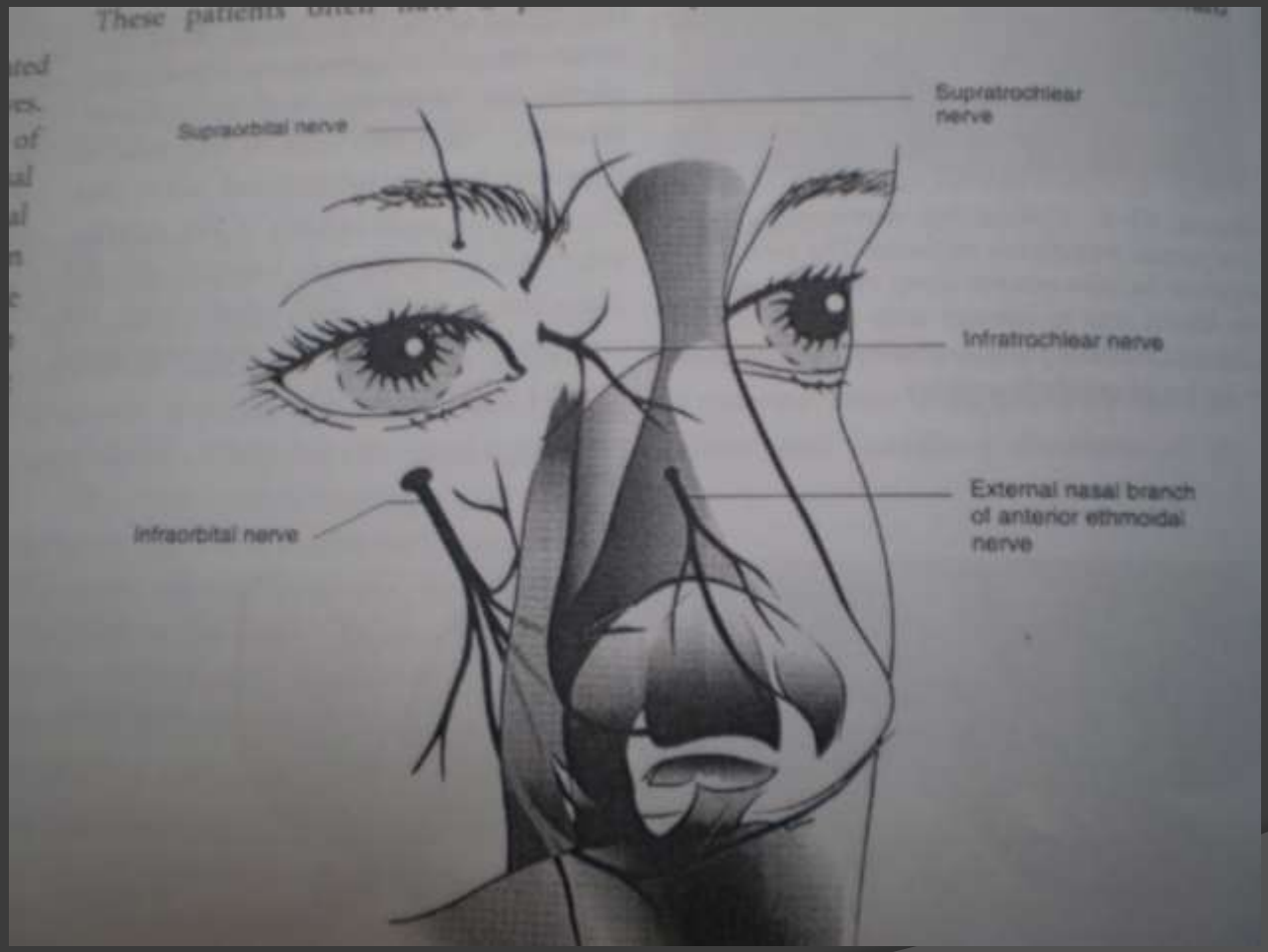

UPPER NASAL CARTILAGE
CARTILAGE OF SEPTUM
LOWER NASAL CARTILAGE
ALAR CARTILAGES
UPPER NASAL CARTILAGE
CARTILAGE OF SEPTUM
LOWER NASAL CARTILAGE
SEPTAL PROCESS OF LOWER NASAL CARTILAGE
CARTILAGES OF ALA
CARTILAGE OF SEPTUM

NOSE


Procerus muscle
Transverse nasalis muscle
Dilator naris anterior muscle
Levator labii superioris alaeque nasi muscle
Compressor narium minor muscle
Depressor septi nasi muscle
Alar nasalis muscle
Orbicularis oris muscle


Supratrochlear artery
Dorsal nasal artery
External nasal branch of anterior ethmoidal artery
Lateral nasal artery
Columellar branch
Septal branch
Angular artery
Superior labial artery

NOSE


Supratrochlear nerve
Supraorbital nerve
Infratrochlear nerve
External nasal branch of anterior ethmoidal nerve
Infraorbital nerve

NOSE

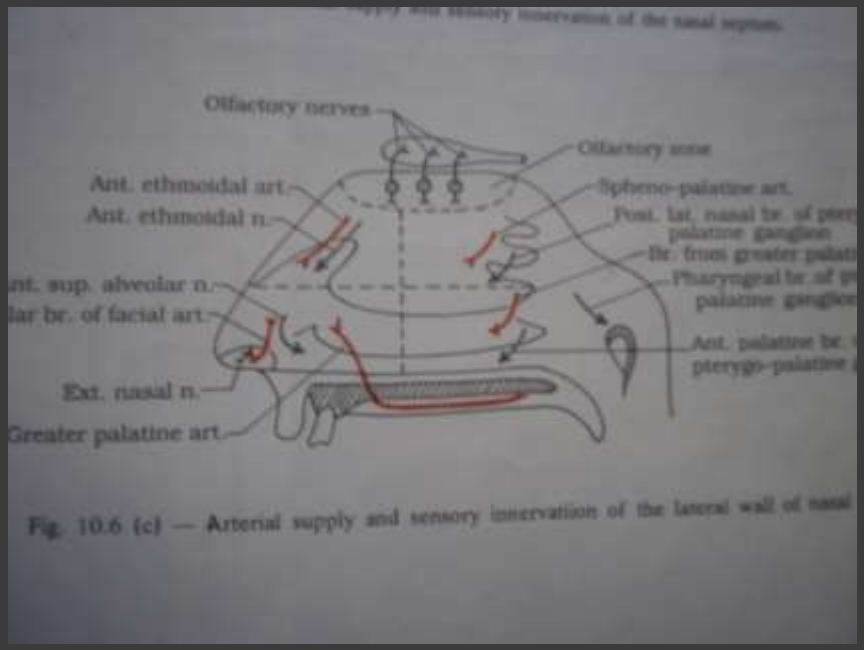


Fig. 10.6 (c) — Arterial supply and sensory innervation of the lateral wall of nasal

LATERAL WALL

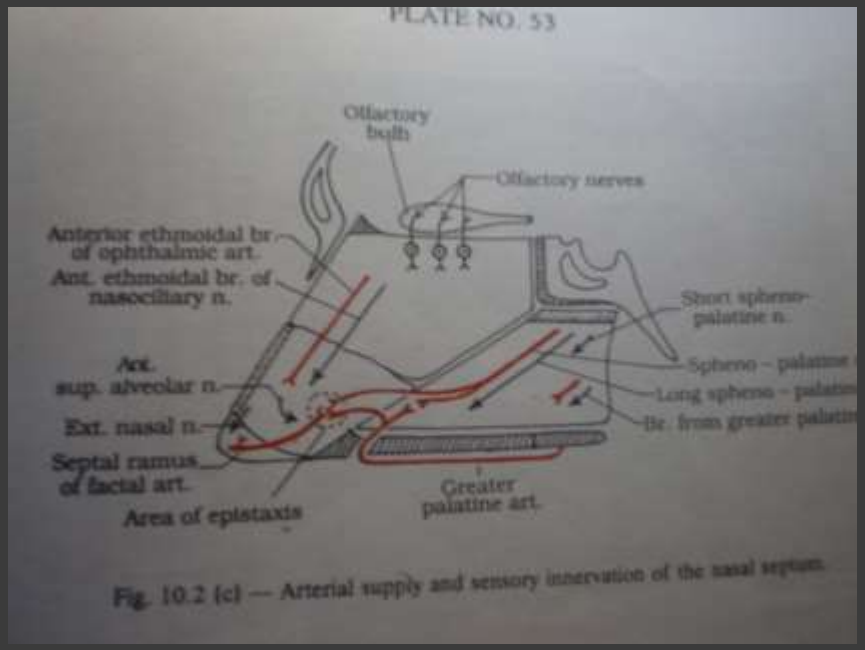


Fig. 10.2 (c) — Arterial supply and sensory innervation of the nasal septum.

NASAL SEPTUM

CLASSIFICATION OF FRACTURES

- RENE LEFORT (1901)
  - LE FORT 1
  - LEFORT 2
  - LEFORT 3

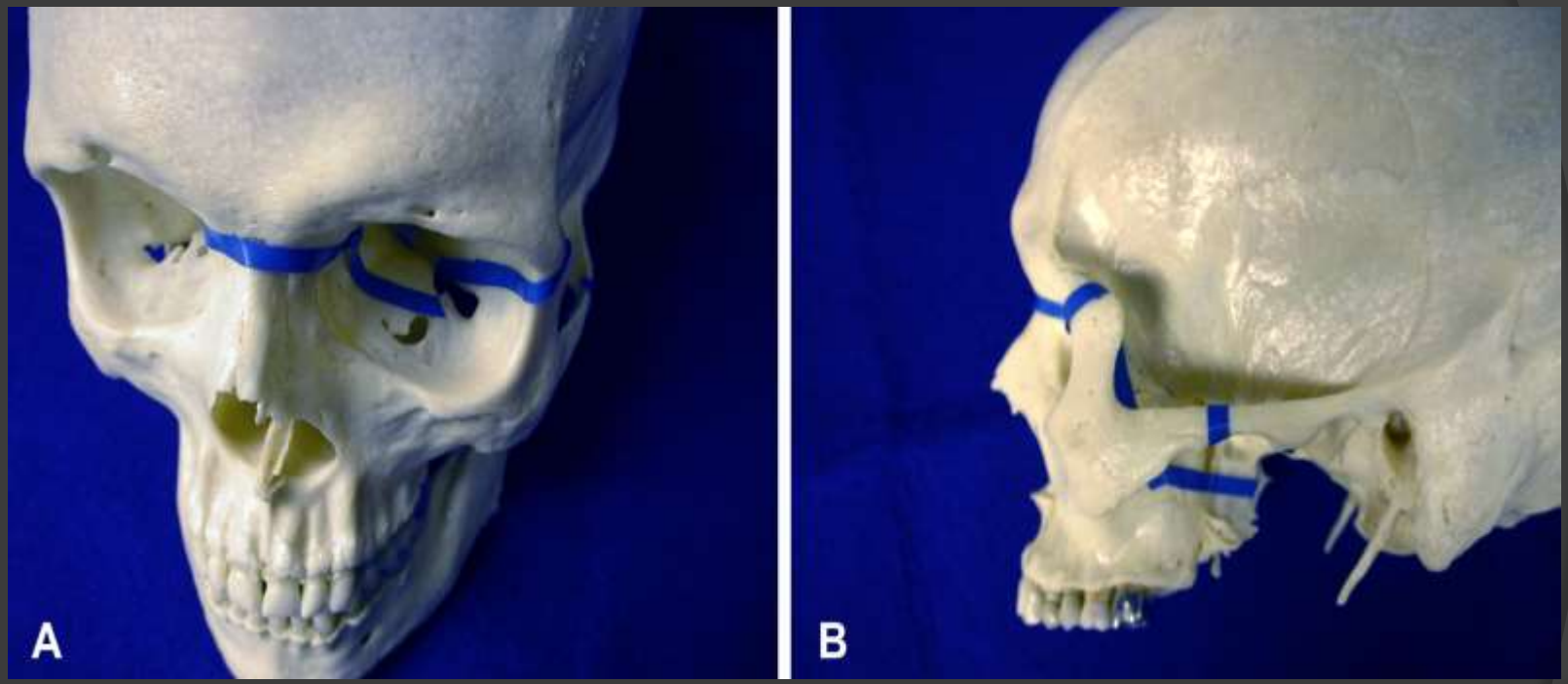
- The Le fort I # courses from the lateral border of pyriform sinus ,across the lateral antral wall,behind the maxillary tuberosity and across the pterygoid junction.

- The # line occurs along the nasofrontal suture through the lacrimal bones,and across the infraorbital rim in the region of zygomaticomaxillary suture.The # then courses inferiorly and distally following a parallel and somewhat a higher path then the lefort I #. It completes its course along the lateral antral wall at the junction of the pterygoid plates

LEFORT 3

- The fracture line courses through the zygomaticotemporal and zygomaticofrontal sutures,along the lateral orbital wall,through the inferior orbital fissure,and medially to the nasofrontal suture.The # line ends at the pterygomaxillary fissure.

LEFORT 3



MODIFICATION

- LEFORT 1
  a) MULTIPLE SEGMENTS

- LEFORT 2
  a) NASAL FRACTURE
  b)NOE FRACTURE

- LEFORT 3
  a) NASAL FRACTURE
  a)NOE FRACTURE

- LEFORT 4
  LEFORT 2 OR 3 AND CRANIAL BASE FRACTURE
  a) SUPRA ORBITAL RIM FRACTURE
  b) ANTERIOR CRANIAL FOSSA+SUPRA ORBITAL RIM
  c) ANTERIOR CRANIAL FOSSA+ORBITAL WALL

DISADVANTAGES

- Insufficient description of the fracture
- Comminuted fractures description
- Complexities of the fracture is not explained.
- Does not define the facial skeletal support.

ROW AND WILLIAMS(1985)

- CENTRAL REGION
  A)FRACTURES OF THE NASAL BONES AND/OR NASAL SEPTUM
    1)LATERAL NASAL INJURIES
    2)ANTERIOR NASAL INJURIES
  B)FRACTUERS OF THE FRONTAL PROCESS OF THE MAXILLA
  C)FRACTURES OF TYPES A AND B INVOLVIN ETHMOID BONE.
  D)FRACTURES OF TYPE A ,B AND C INVOLVING FRONTAL BONE

- LATERAL REGION

  - Fractures involving zygomatic bone,arch and maxilla excluding the alveolar component.

  -Fractures involving the occlusion

  1)Dento alveolar fractures

  2)Subzygomatic

  a)Lefort 1

  b)Lefort 2

  3)Suprazygomatic

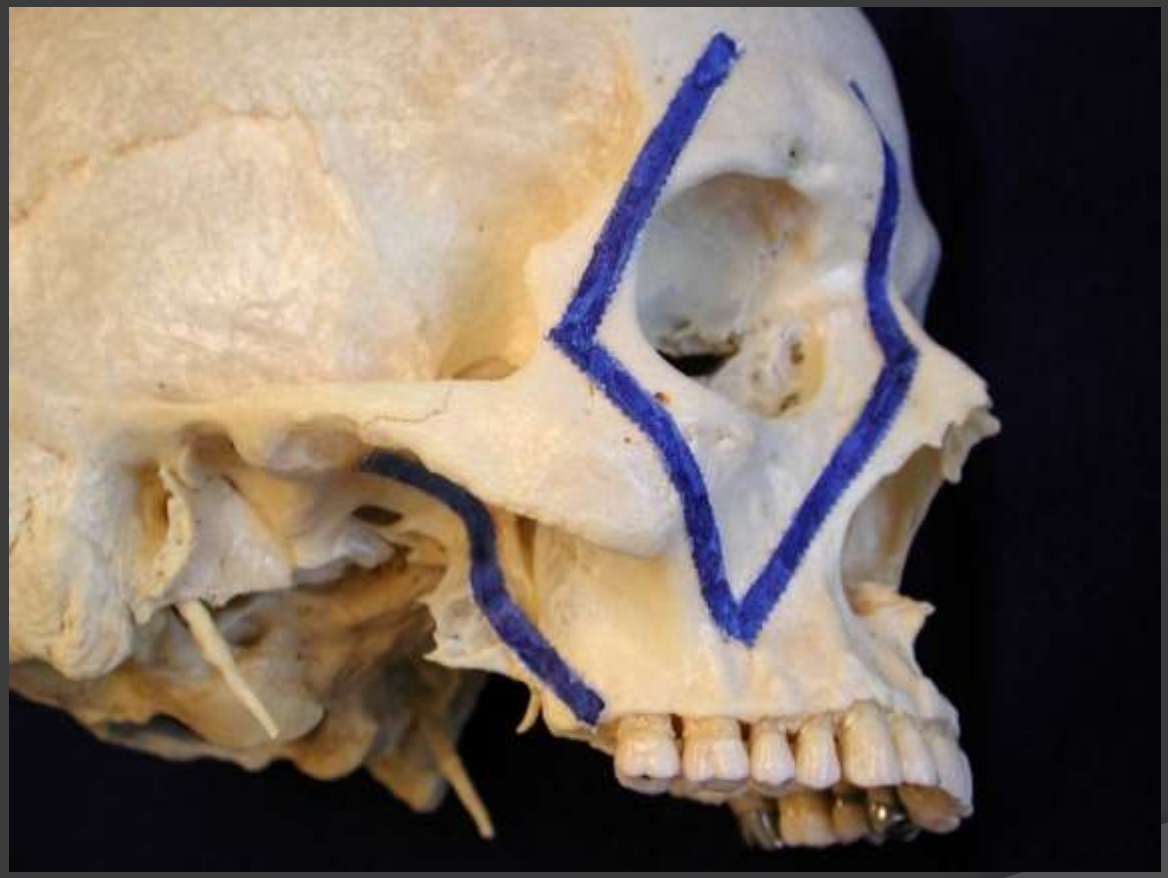
  Lefort 3

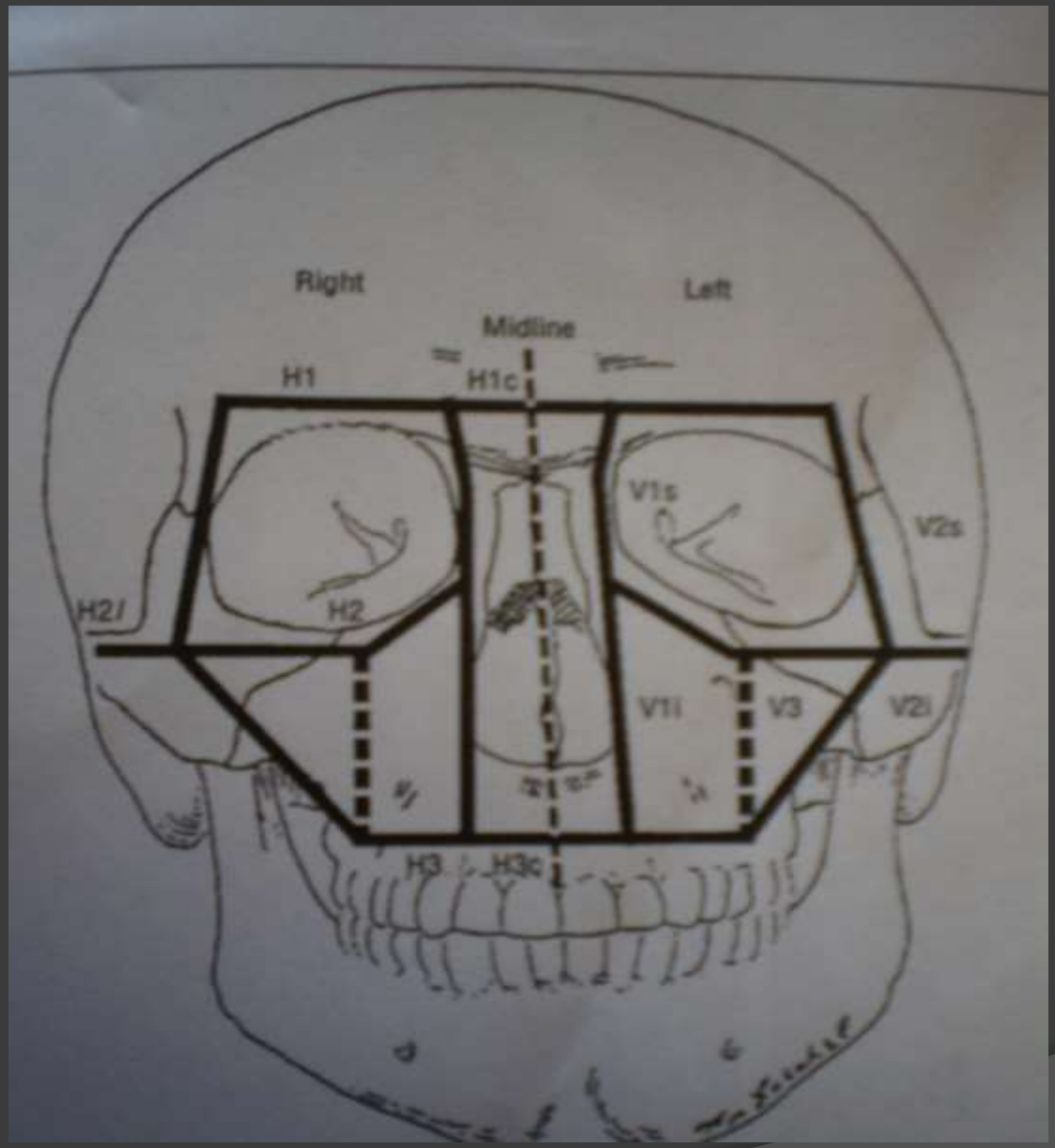
DONAT ET AL (1998)

- AIMS
- To accurately represent the anatomy and complexity of the overall midfacial fracture pattern
- To describe the involved functional skeletal supports critical to the proper design for surgical therapy.
- To provide a meaningful common terminology for communication between radiologist and surgeon
- To provide specific information sufficient for comparision of tratment outcomes

HORIZONTAL BEAMS

VERTICAL BUTTRESS




Right
Left
Midline
H1
H1c
V1s
V2s
H2l
H2
V1i
V3
V2i
H3
H3c

DISADVANTAGES

- SOFT TISSUES
- DISPLACEMENT AND COMMINUTION