REGIONAL INJURIES - 1


Be kind. Work
hard. Stay humble.
Smile Often.

OBJECTIVES

At the end of the lecture the student should be able to,

- Describe injuries in specific regions
- Identify injuries in relation to body regions
- Describe the mechanism of causation
- Form an opinion about the seriousness of regional injuries
- Identify the complications of regional injuries

CLASSIFICATION OF REGIONAL INJURIES

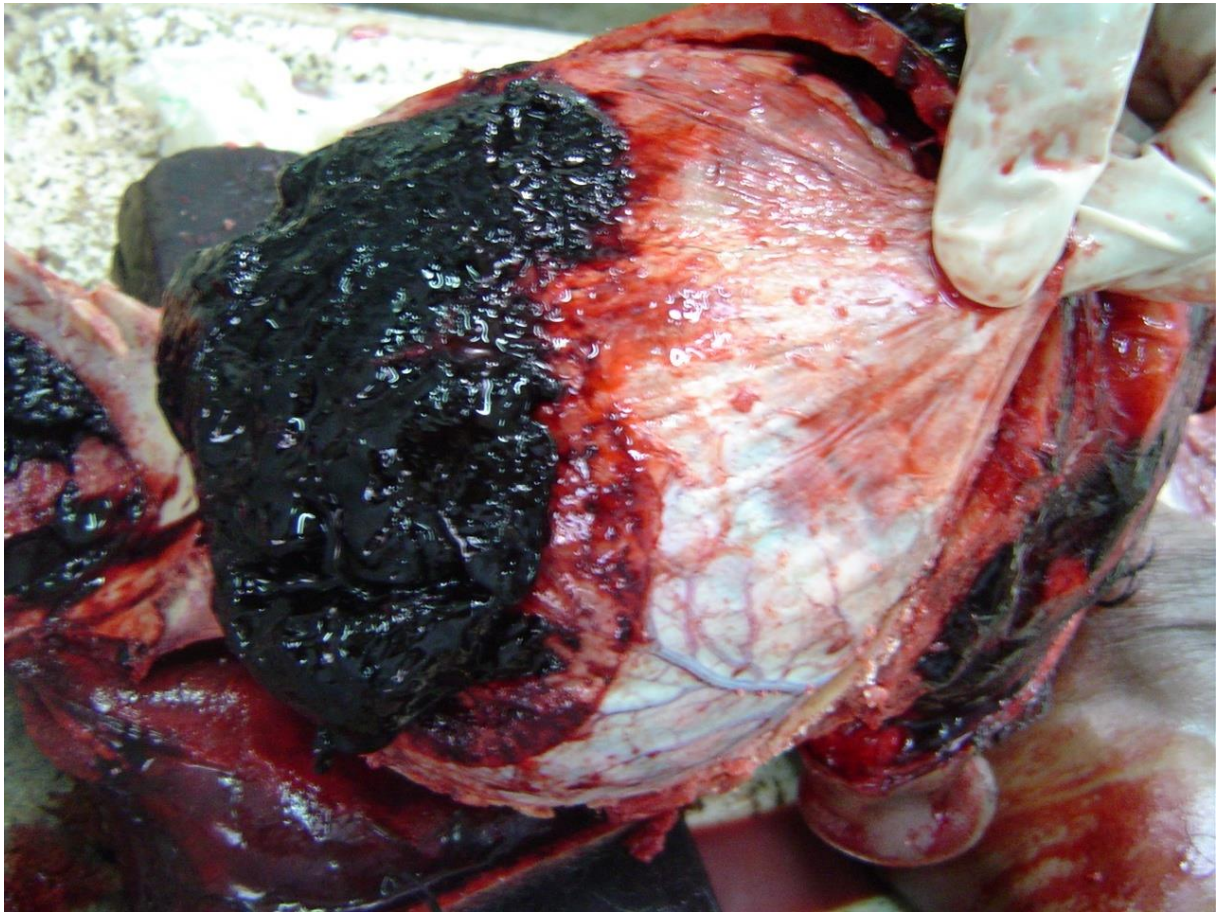
Can be classified in reference to the part of the body involved

- Head injuries
- Facial injuries
- Neck injuries

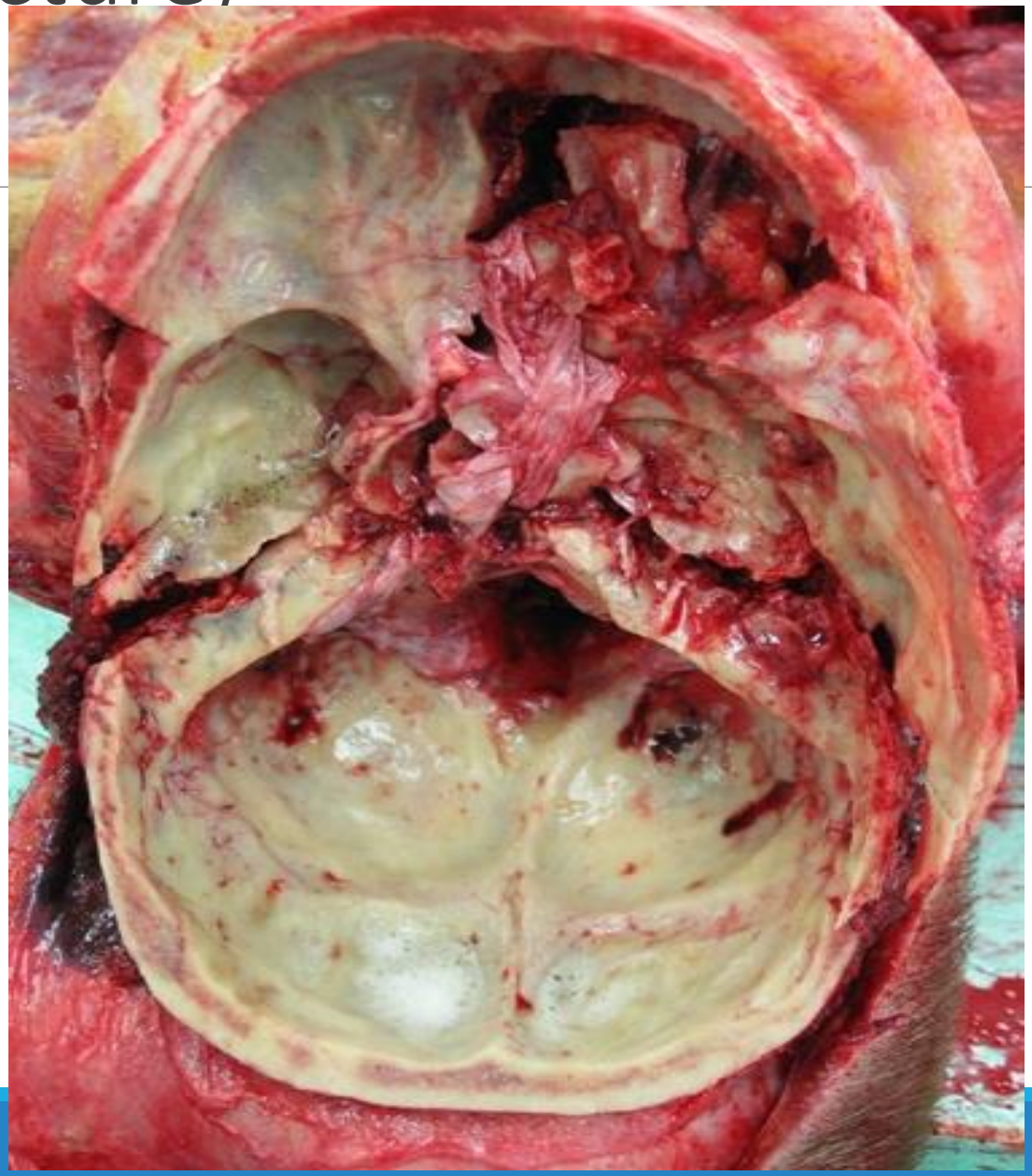
CLASSIFICATION OF REGIONAL INJURIES

- Spinal injuries
- Chest injuries
- Abdominal and Pelvic injuries
- Injuries to extremities

Extra Dural haemorrhage



Base of skull fracture (Hinge Fracture)



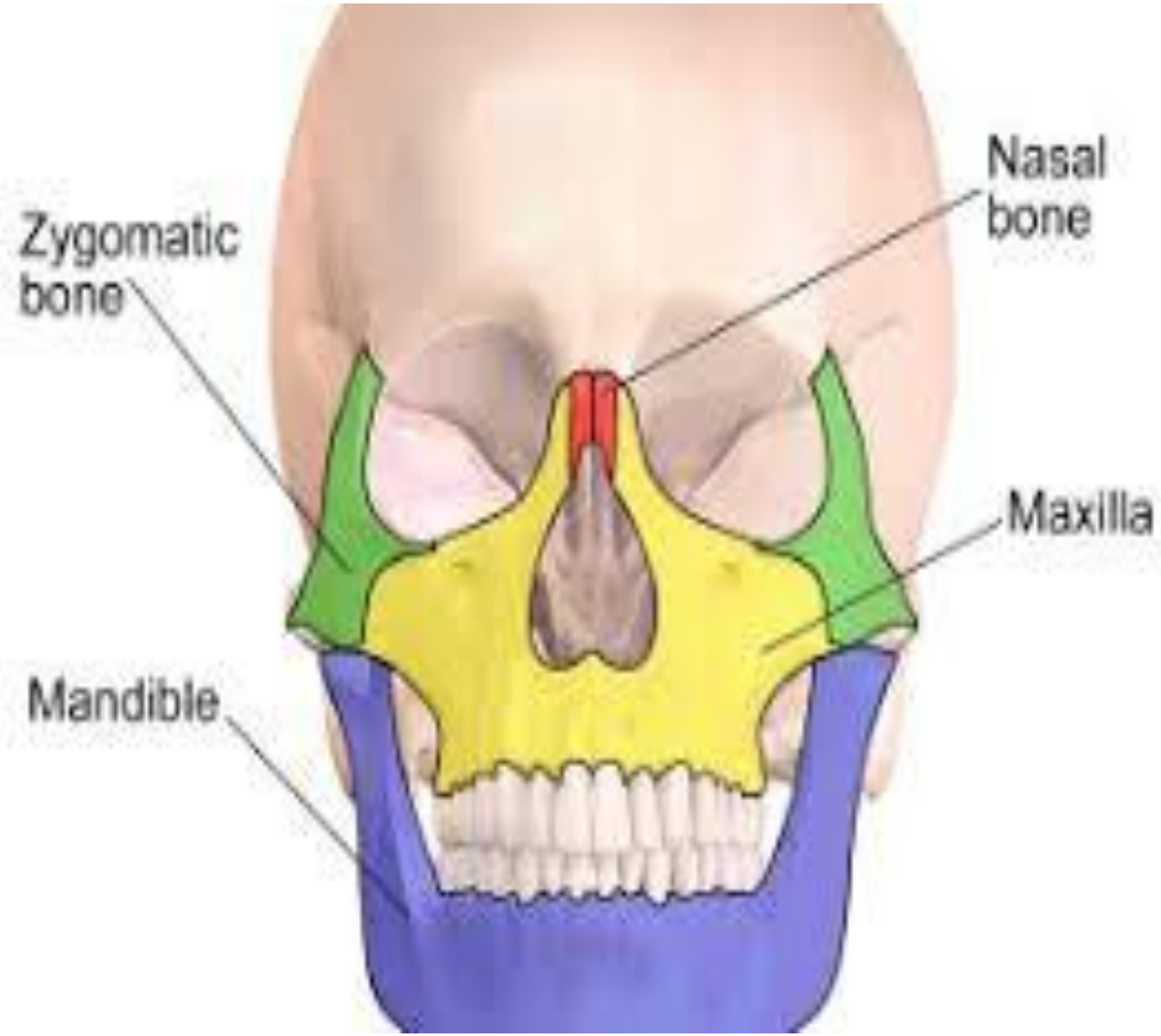
Facial Injuries

Involves the following

- Skin and soft tissues
- Facial skeleton and structures in the facial cavity such as
  - Eyes
  - Ears
  - Nose
  - Mouth

Soft Tissues

- **Soft tissue** refers to **tissues** that connect, support, or surround other structures and organs of the body.
- **Soft tissue** includes muscles, tendons, ligaments, fascia, nerves, fibrous tissues, fat, blood vessels, and synovial membranes.


Nasal bone
Zygomatic bone
Maxilla
Mandible

Skin & Soft Tissues

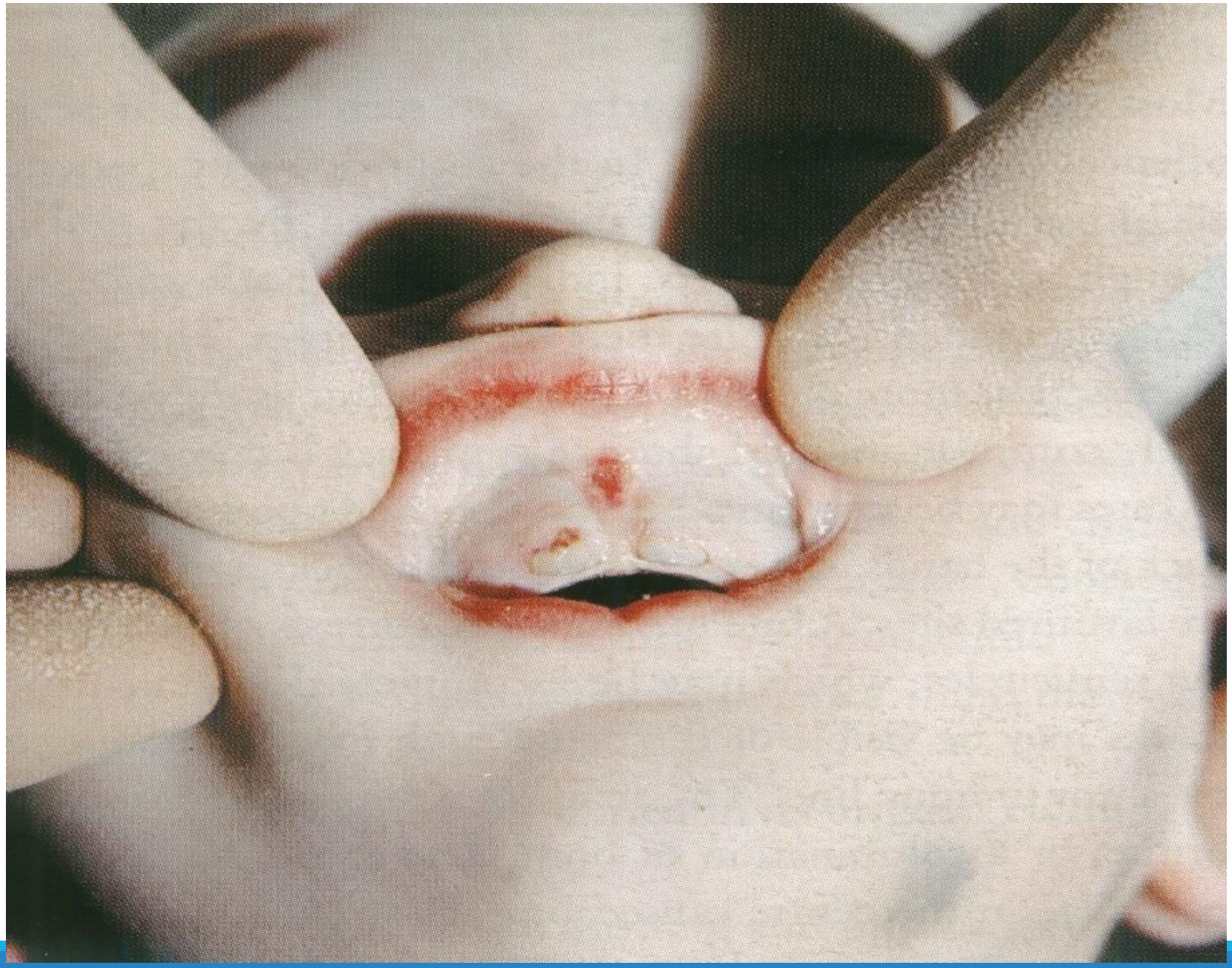
Injuries include

- Abrasions, contusions, lacerations, incised wounds, stabs,firearm injury

Special circumstances

- Smothering , Forcible ingestion of poison, forcible closure of mouth in sexual assault& robbery, physical child abuse, kicking

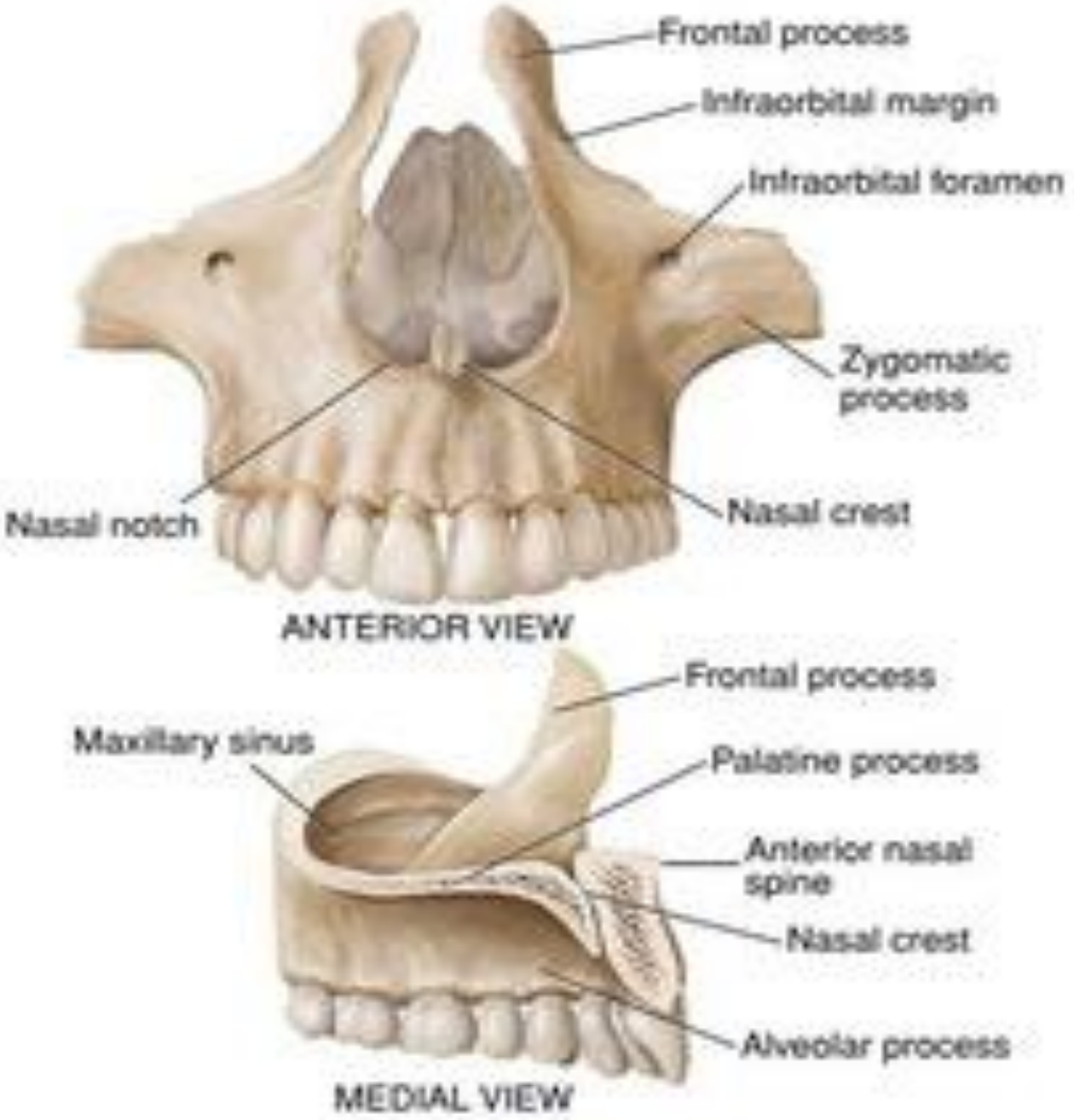
Superficial cut injuries



Facial skeleton

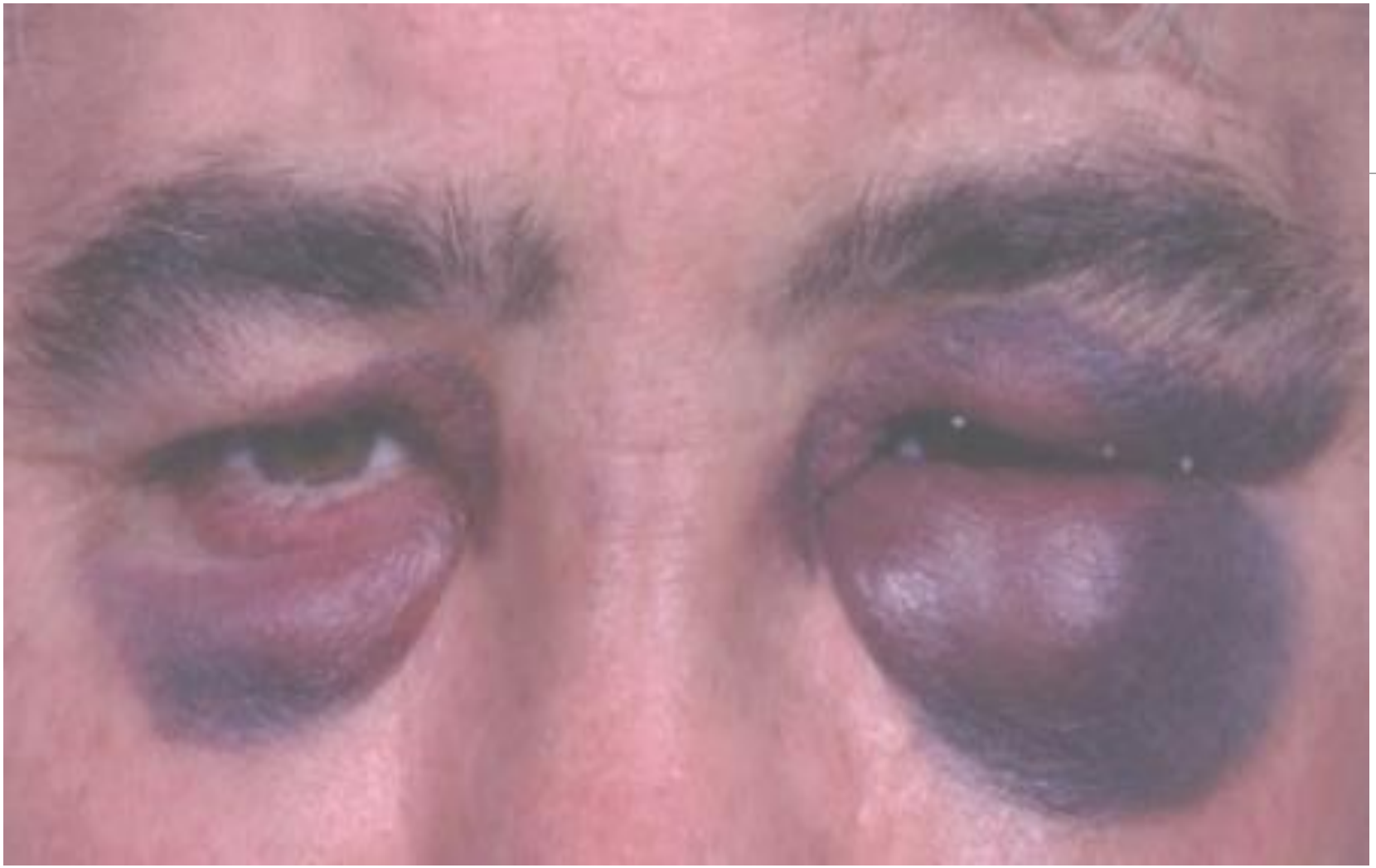
- Fractures and dislocations
- May be associated with fractures of the base of the skull
- Common injuries include – Fractures of the nasal bone, mandible, superior maxillae and malar bone, frontal bone


Malar


Frontal process
Infraorbital margin
Infraorbital foramen
Zygomatic process
Nasal notch
Nasal crest
ANTERIOR VIEW
Frontal process
Maxillary sinus
Palatine process
Anterior nasal spine
Nasal crest
Alveolar process
MEDIAL VIEW

Eyes

- Black eye
- Sub conjunctival haemorrhage
- Corneal abrasion
- Retinal detachment
- Orbital blow out fracture
- Scleral rupture
- Injuries to the lens
- Penetrating injuries, Burns from chemicals

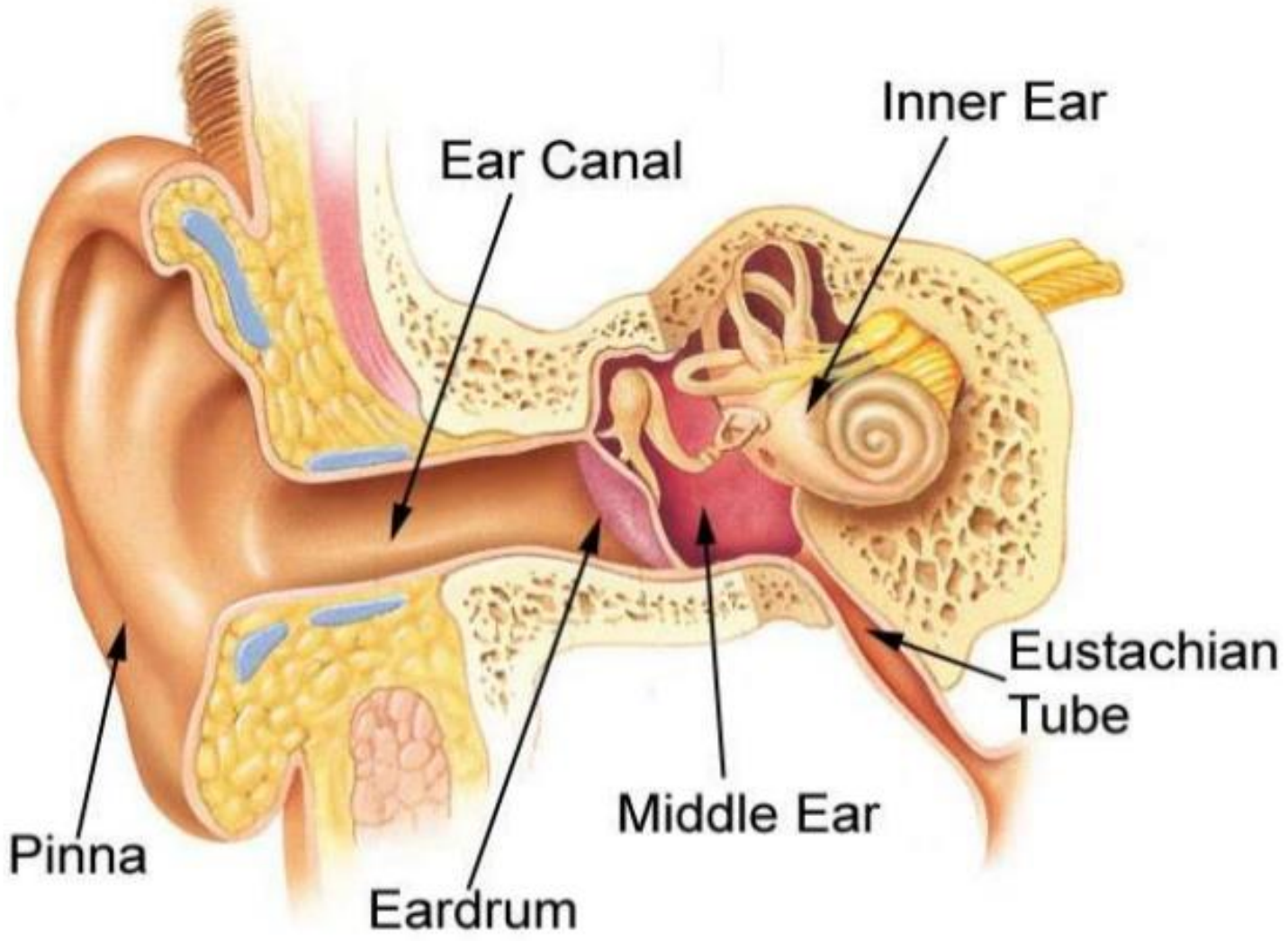


Laceration with black eye

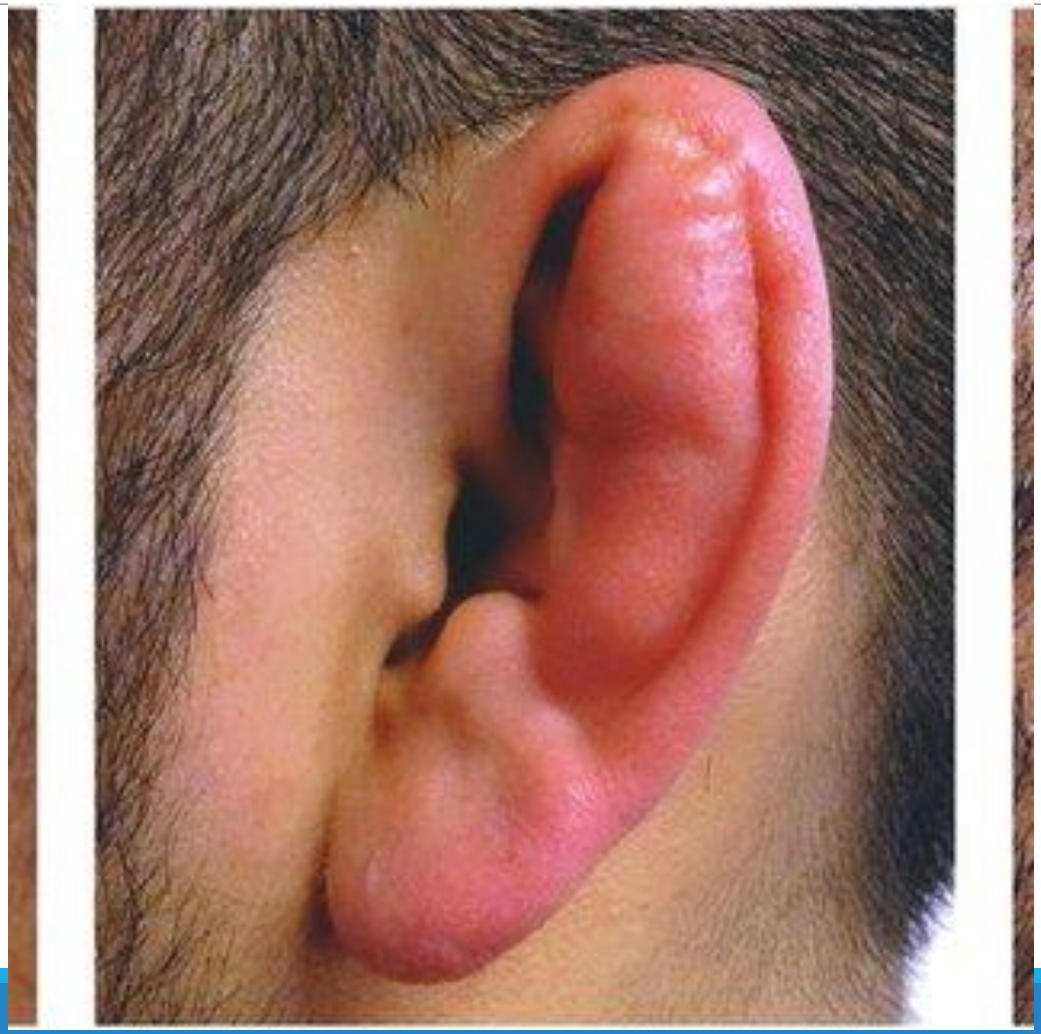
Acid burns

Ears

- Pinna - abrasions, contusions, lacerations, incised wounds, bites, haematoma, fracture of the cartilage, cauliflower ear, tin- ear syndrome (unilateral ear bruising, ipsilateral cerebral oedema, haemorrhagic retinopathy)
- External auditory canal
- Eardrum - rupture
- Middle ear – longitudinal fracture of the petrous bone results in dislocation of the incus
- Inner ear – transverse fracture of the petrous bone results in laceration of cochlea


Inner Ear
Ear Canal
Eustachian
Tube
Middle Ear
Pinna
Eardrum

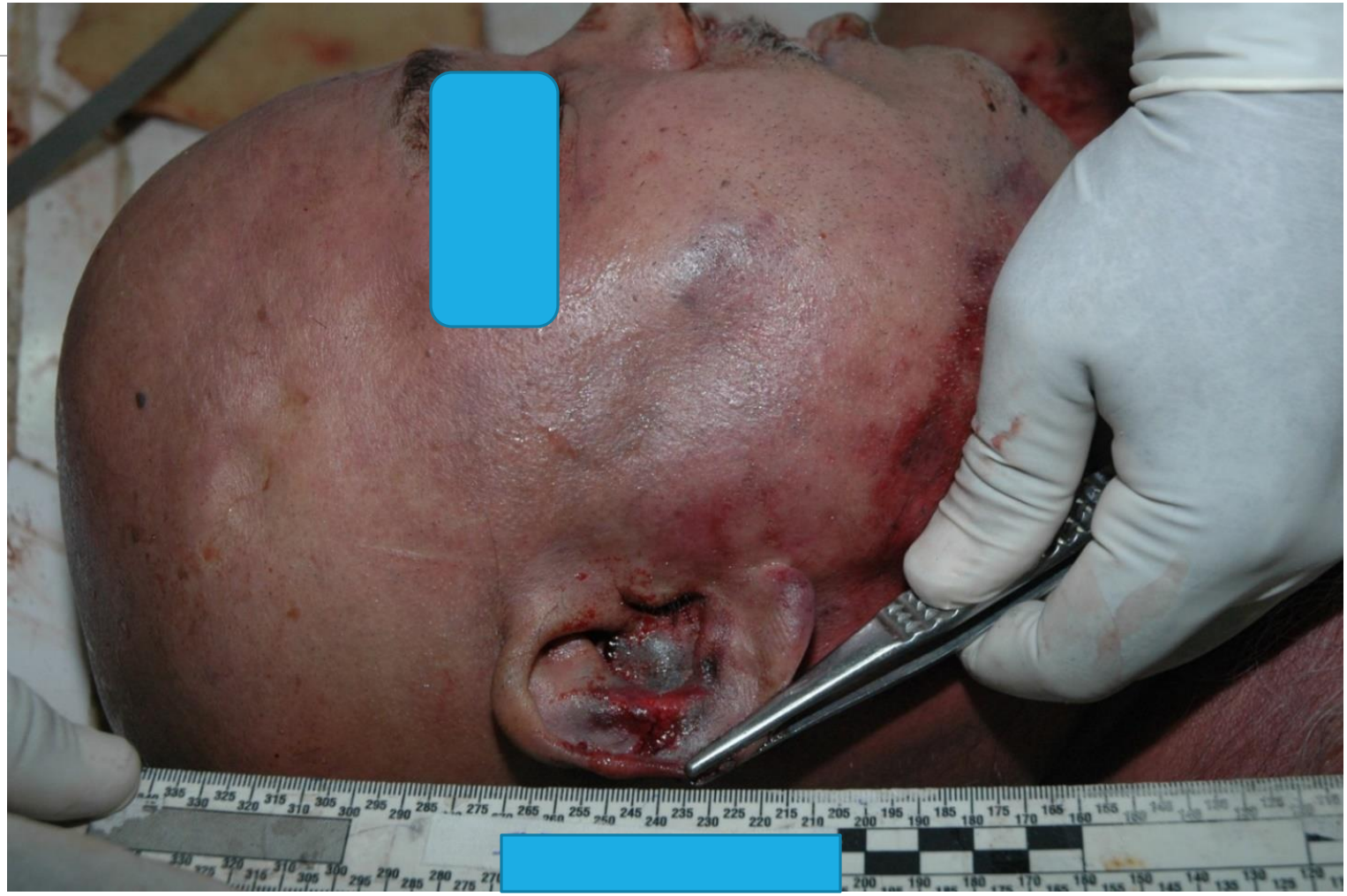
Pinna haematoma



CAULIFLOWER EAR

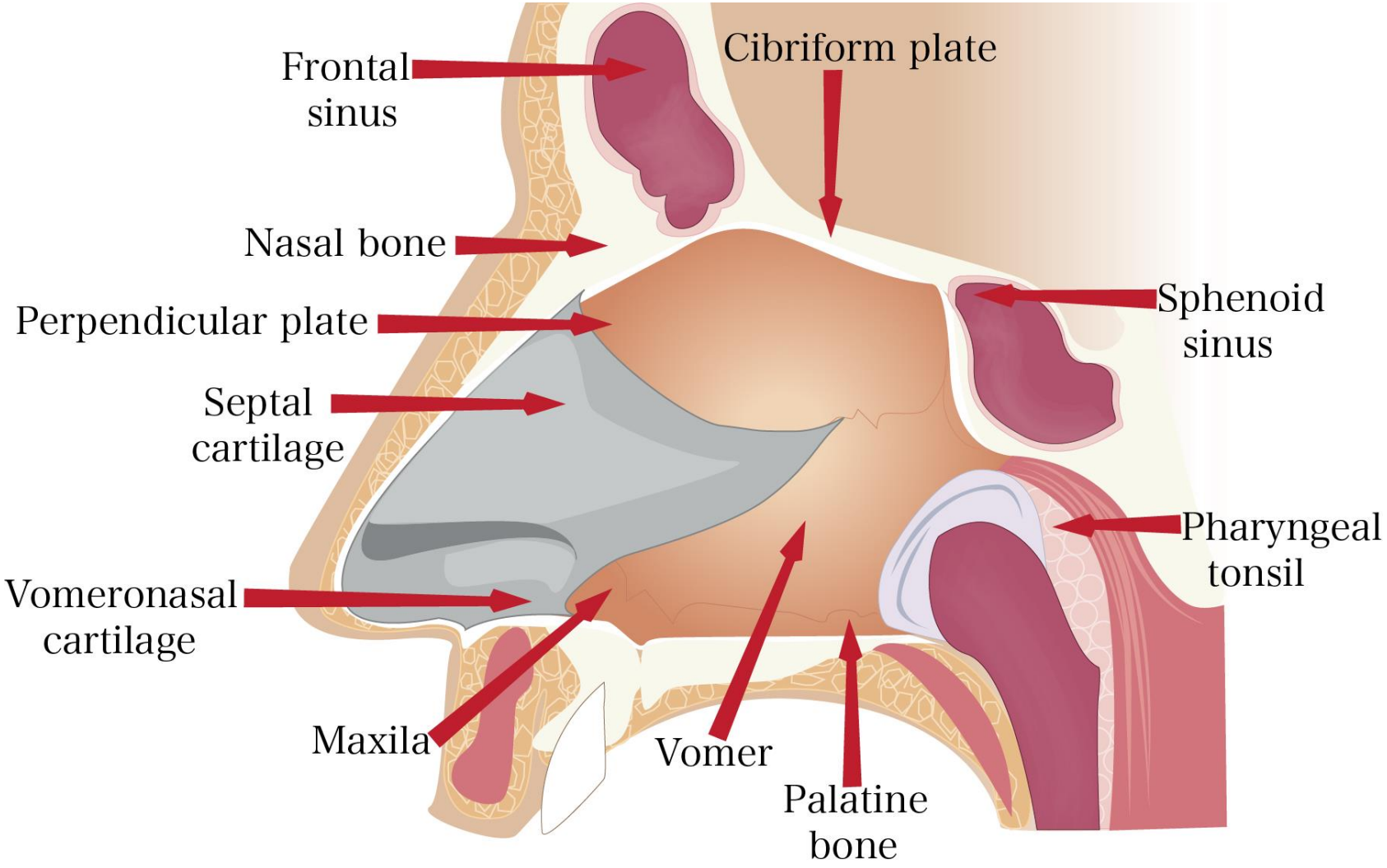
Avulsed ear

Contusion with abrasion



Nose

- Injuries to soft tissues
- Nasal bone fractures
- Cartilage rupture
- Traumatic epistaxis
- Permanent impairment of smell


Frontal sinus
Cibriform plate
Nasal bone
Perpendicular plate
Sphenoid sinus
Septal cartilage
Pharyngeal tonsil
Vomeronasal cartilage
Maxila
Vomer
Palatine bone

Nasal bone fracture

Mouth

- Soft tissue injuries to the lips and buccal mucosa
- Lacerated gums
- Injuries to tongue
- Fracture/dislocated tooth
- Burns inside the mouth, tongue
- Loss of taste

Open mandibular fracture

Neck Injuries

Due to

- Blows with blunt and sharp weapons
- Stabs
- Penetrating missiles
- Compression
- Excessive movement of the neck

Neck injuries

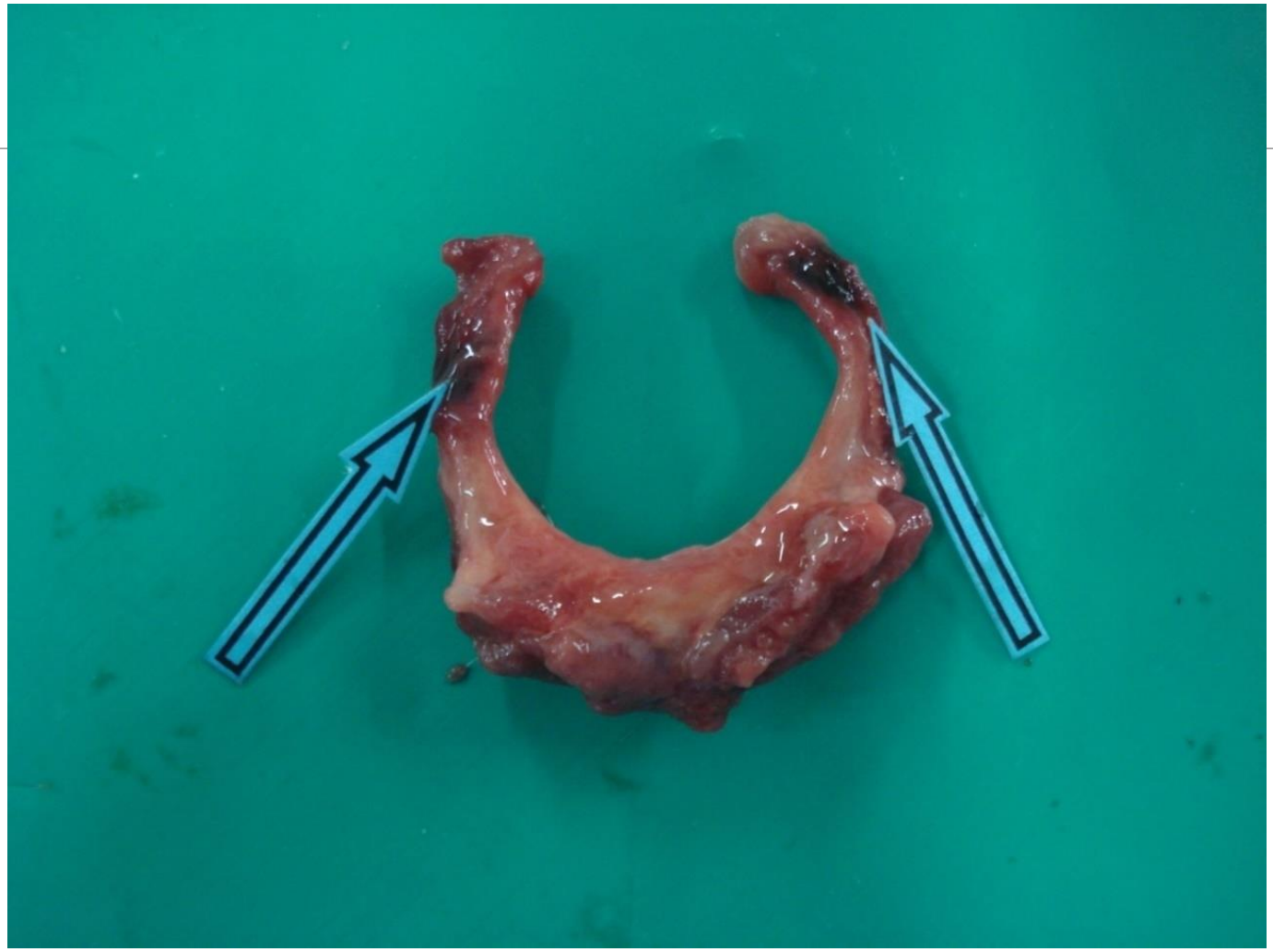
Injuries to the

- skin
- skin and other soft tissues
- trachea
- hyoid bone and laryngeal cartilage
- blood vessels
- oesophagus
- cervical spine and cord

Friction abrasion

Fractured superior cornu

Fractured hyoid bone



Manual strangulation

Cut throat injury

SPINAL injuries

- Commonly injured in RTA, fall from height, cut, stab, firearm injury

- Caused by compressional, hyperflexion and hyperextension stress

- In falls on the feet from a height and when heavy objects fall

Compression fractures of the vertebral bodies may occur at T12-L1

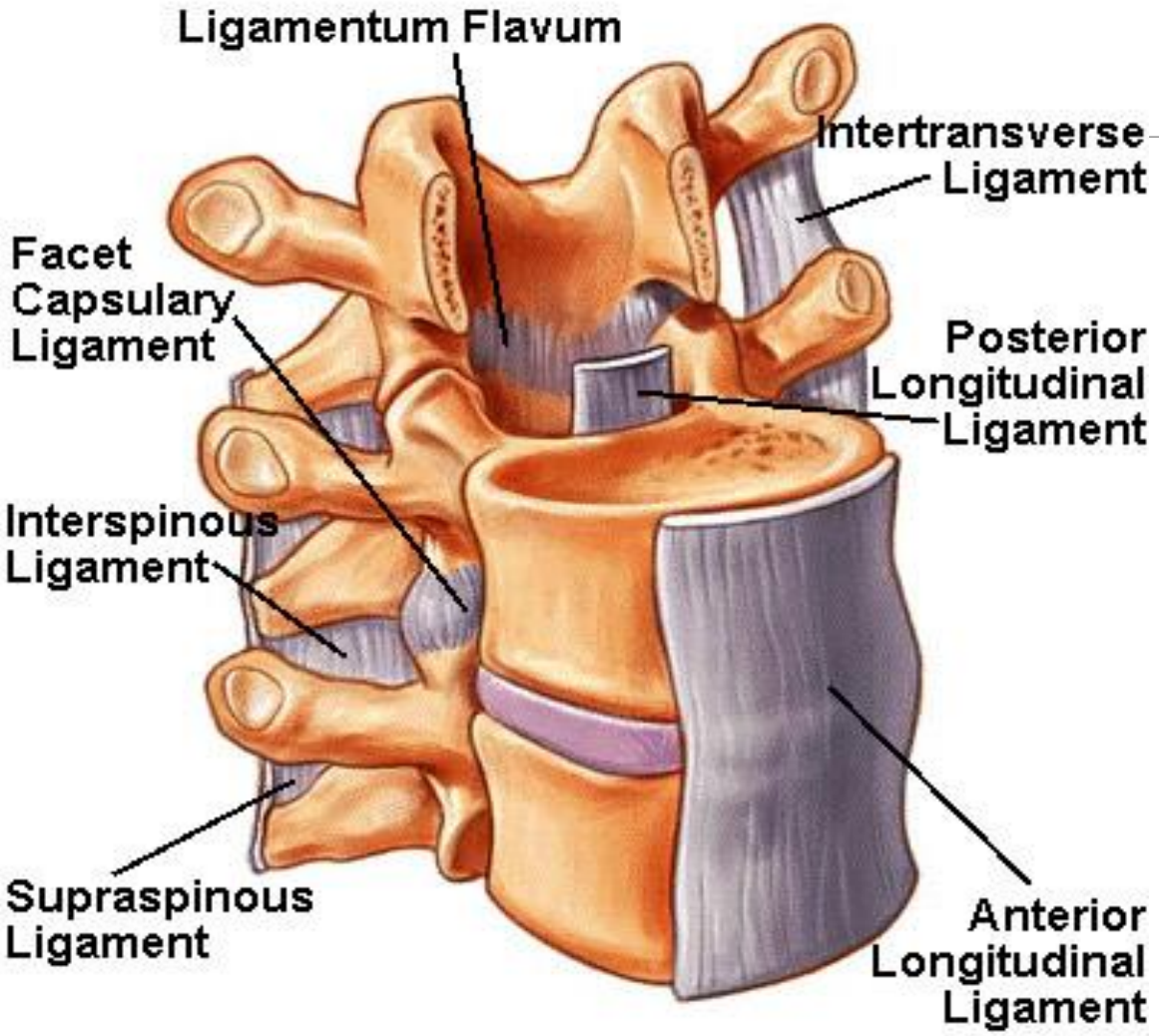
- Whiplash injuries are a specific type of spinal injury

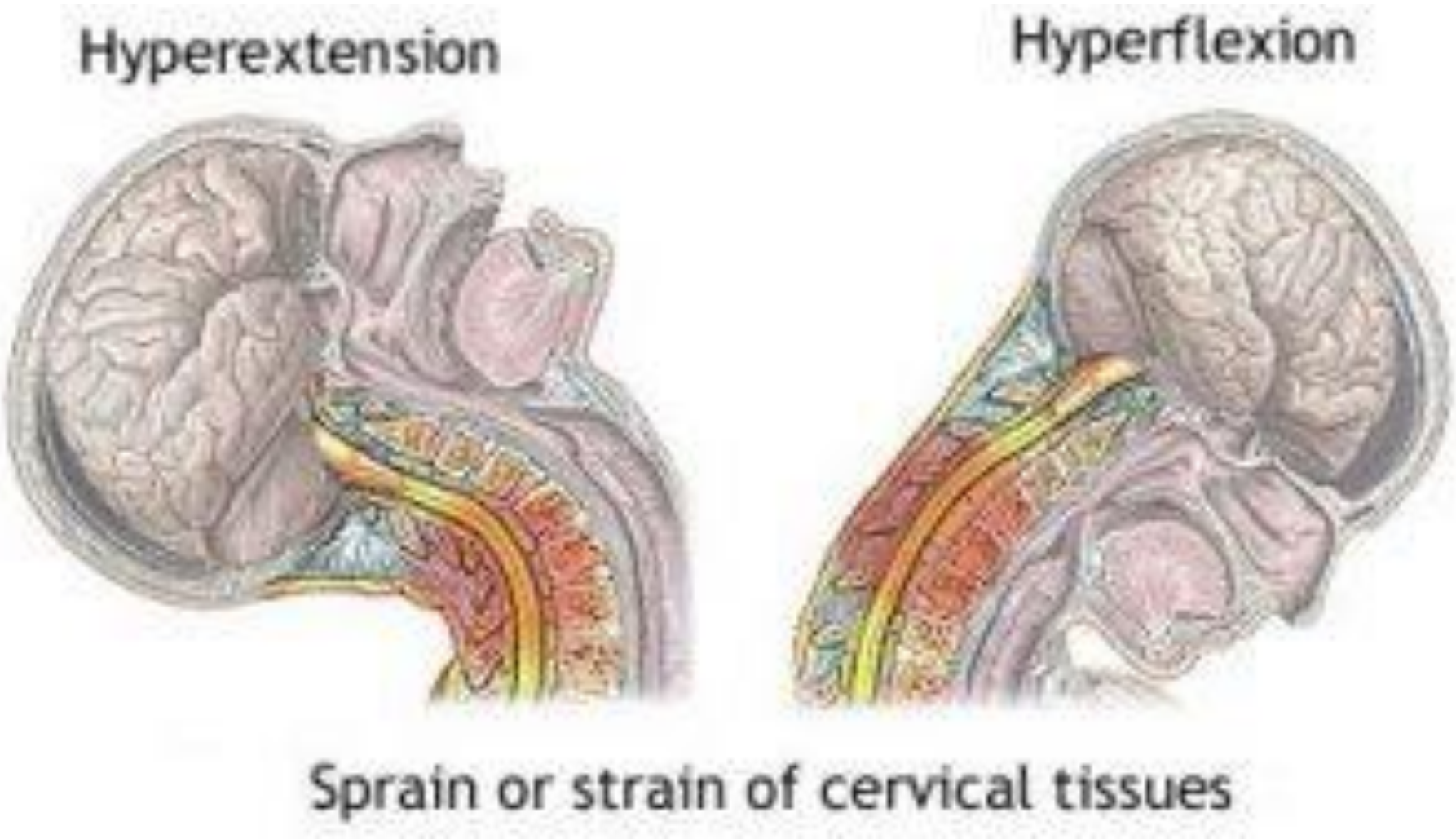
Whip Lash Injury

Whiplash is a relatively common **injury** that occurs to a person's neck following a sudden acceleration-deceleration force that causes unrestrained, rapid forward and backward movement of the head and neck, most commonly from motor vehicle accidents.

Whip Lash Injury

The whiplash injury may consist of injury to soft tissues adjacent to the cervical spine, ligaments, discs and bony structures.


Ligamentum Flavum
Intertransverse Ligament
Facet Capsulary Ligament
Posterior Longitudinal Ligament
Interspinous Ligament
Supraspinous Ligament
Anterior Longitudinal Ligament


Hyperextension
Hyperflexion
Sprain or strain of cervical tissues

SPINAL INJURIES

- Damage to the spinal cord results in paraplegia or quadriplegia

- The vertebral artery may be torn at the atlas, sometimes when transverse process is fractured

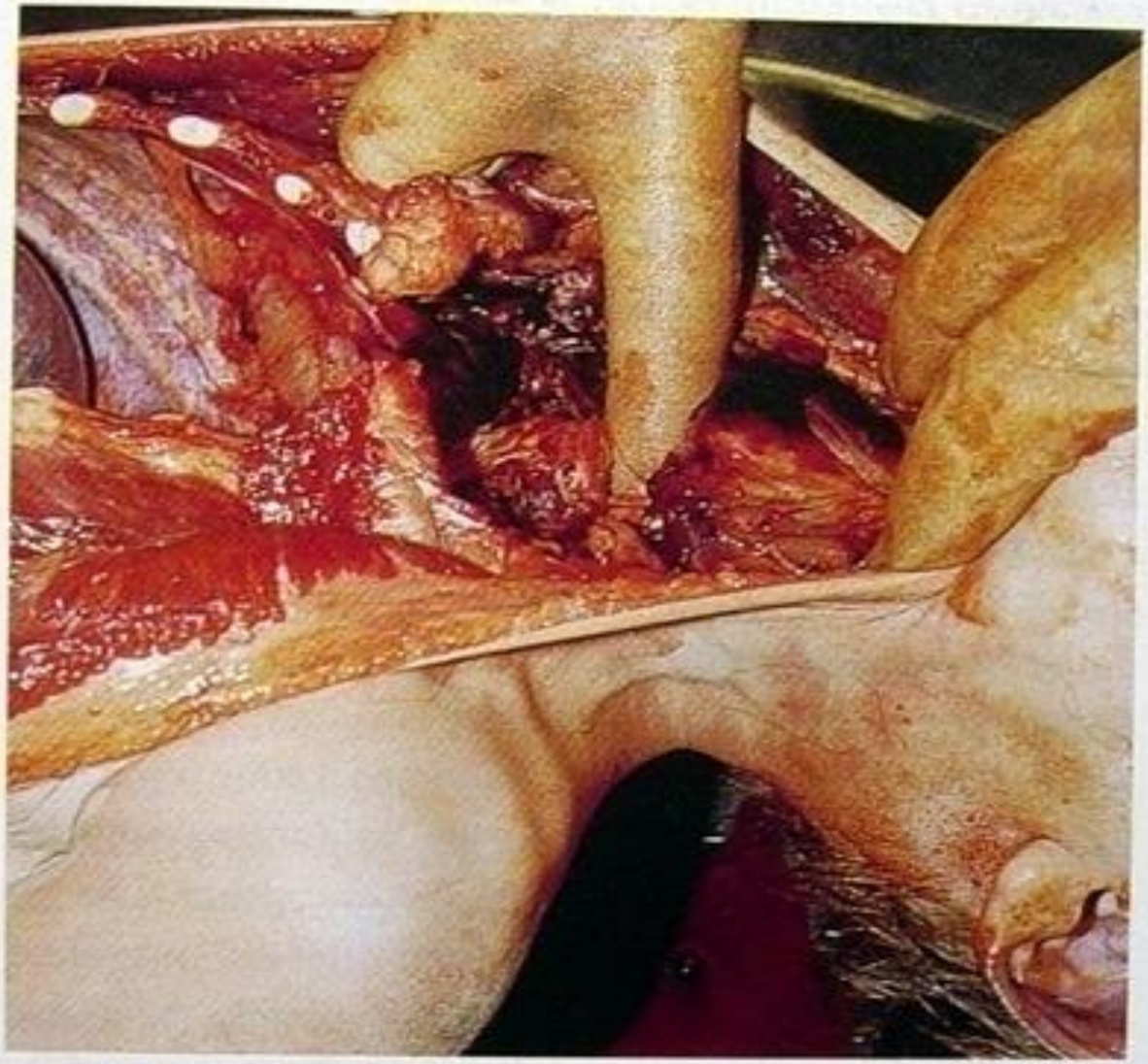


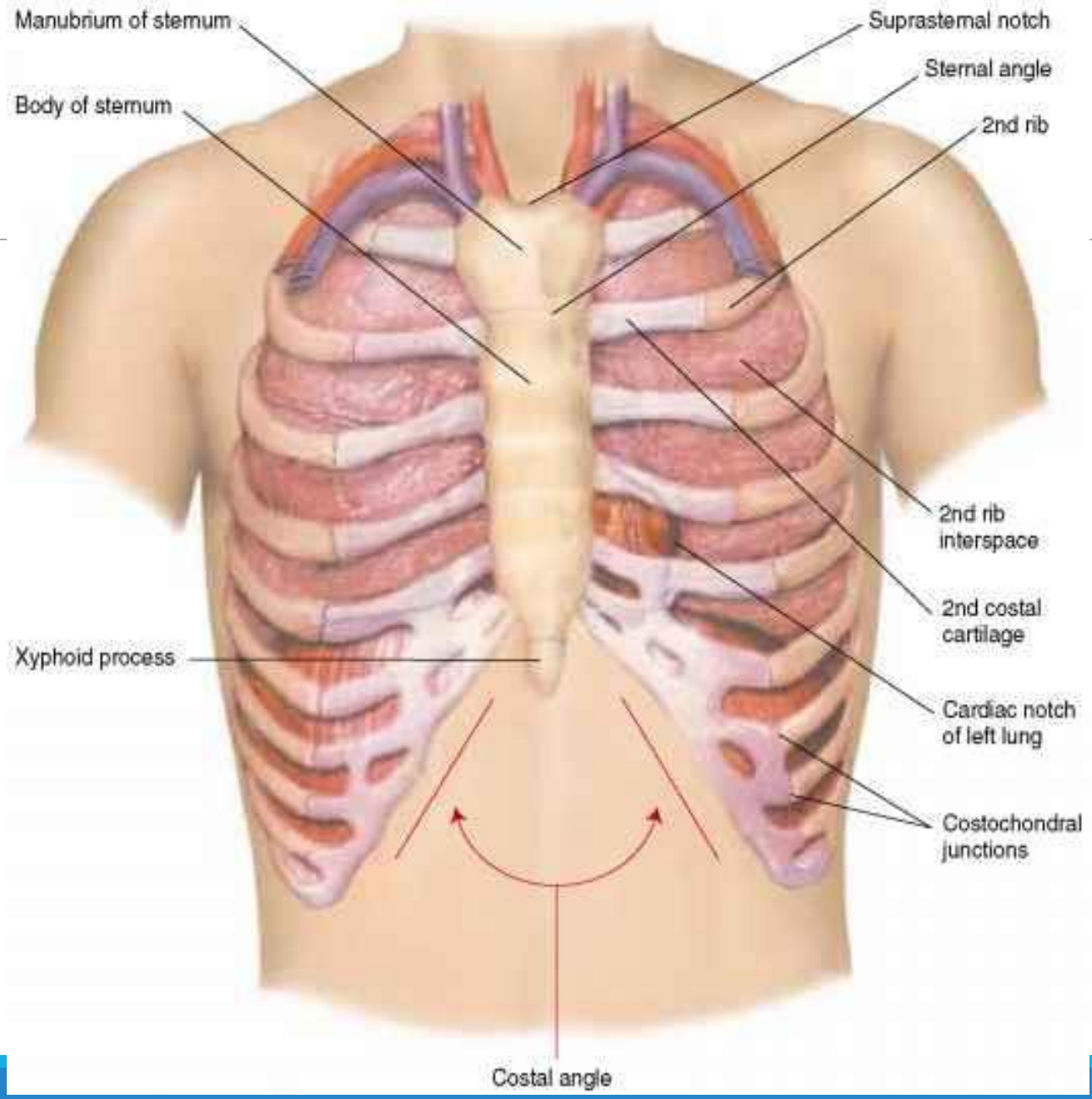
Figure 2.12 *Wide fracture-dislocation of the cervicothoracic spine in a child pedestrian fatality.*

CHEST INJURIES

Mechanical trauma to the chest will result in injuries to the chest wall and viscera

Types of injuries

- Blunt impacts
- Compression injuries (as in traumatic asphyxia)
- Penetrating injuries
- Deceleration
- High velocity blast wave


Manubrium of sternum
Body of sternum
Suprasternal notch
Sternal angle
2nd rib
2nd rib interspace
2nd costal cartilage
Xyphoid process
Cardiac notch of left lung
Costochondral junctions
Costal angle

Chest injuries

- Chest wall – Ribs, manubrium , body of sternum, scapulae, vertebral fracture and dislocation, clavicular fracture

- Chest viscera- Pneumothorax, haemothorax, Injuries to the lungs, Injuries to the heart, Coronary vessels, conducting system, Injuries to the aorta, Injuries to the diaphragm

BLUNT IMPACTS AND COMPRESSION

- Can result in fractures of ribs, sternum, pneumothorax, haemothorax, lacerations of lungs and the heart

- Bilateral multiple rib fractures (flail chest) causes respiratory embarrassment due to difficulty in expansion

Multiple tramline contusions

Seat belt injuries

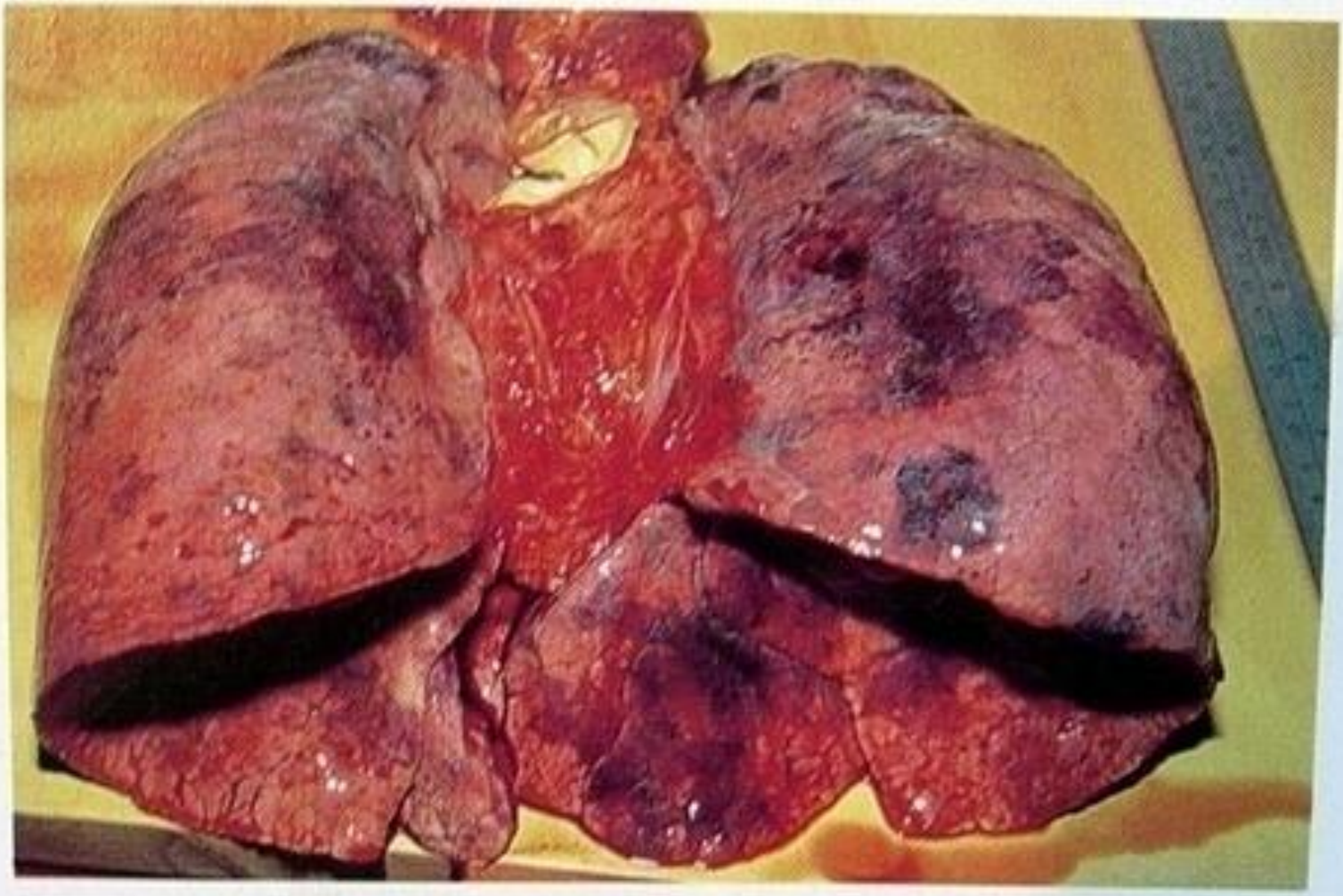
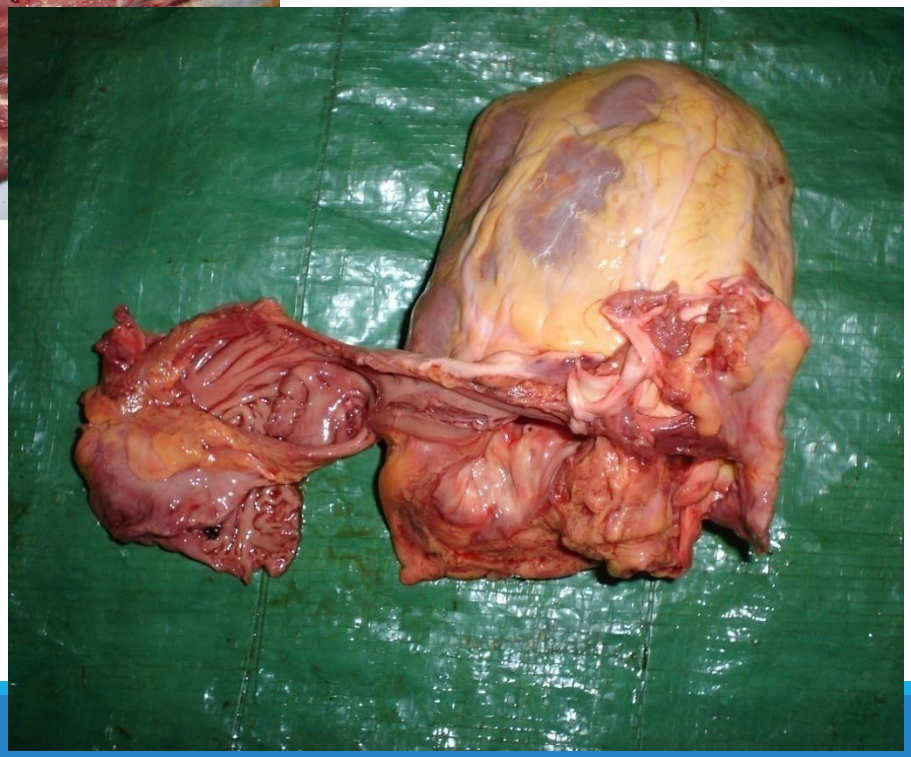


Figure 1.9 *Moderately severe pulmonary contusion in a car driver.*

Tyre imprint abrasion



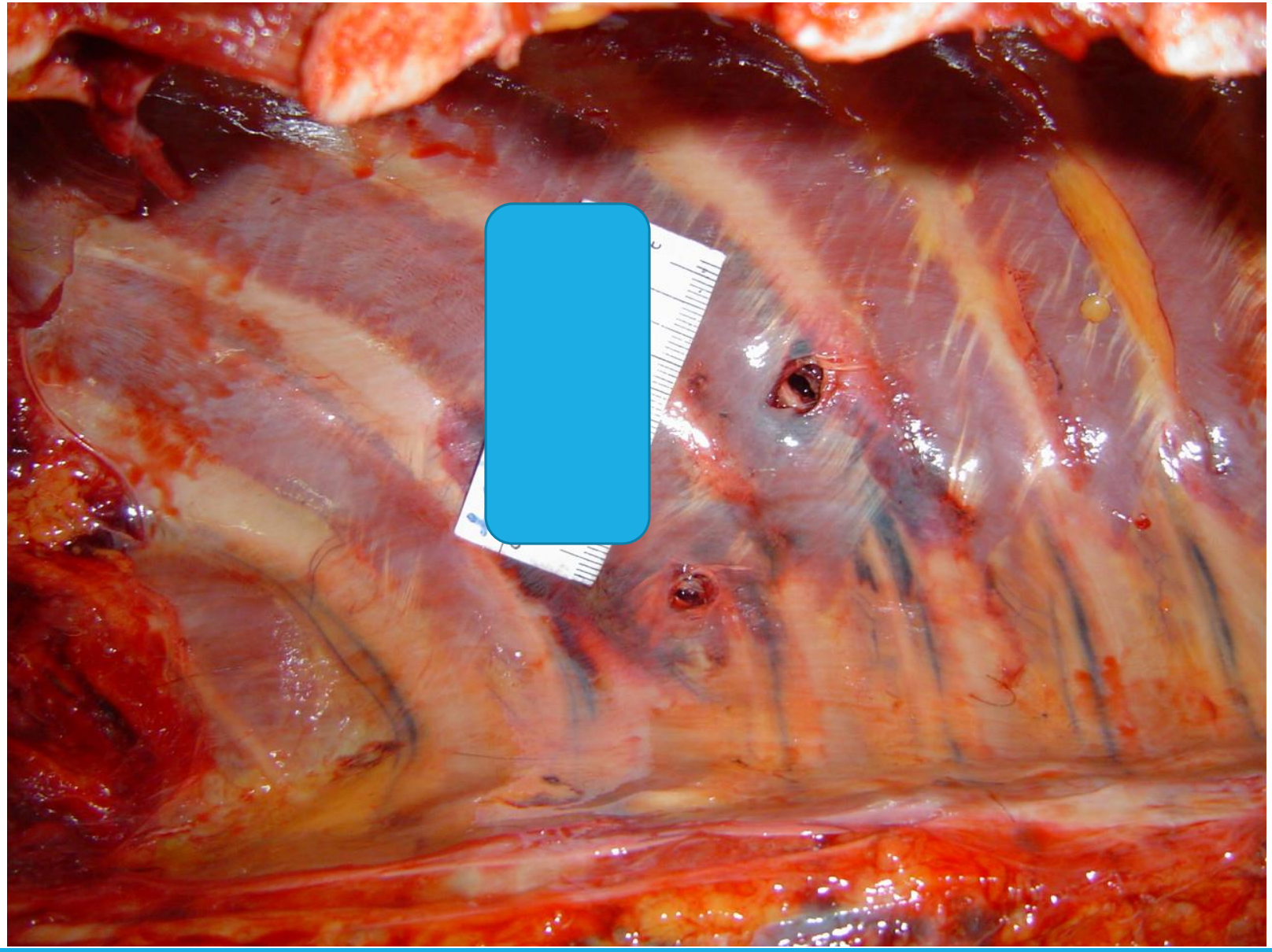
Run-over injury

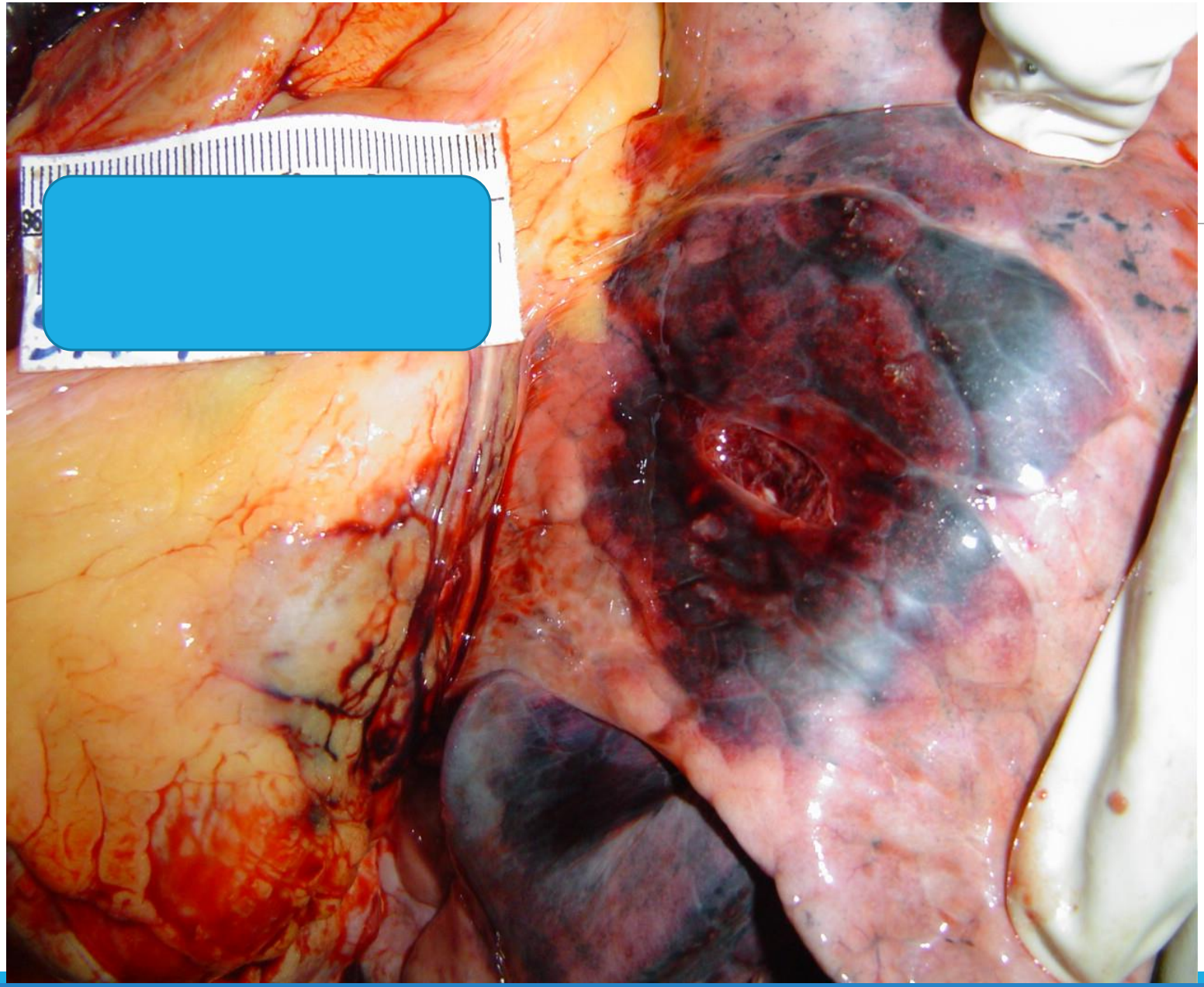
This is haemopericardium as demonstrated by the dark blood in the pericardial sac opened at autopsy. Penetrating trauma or massive blunt force trauma to the chest.

CHEST INJURIES

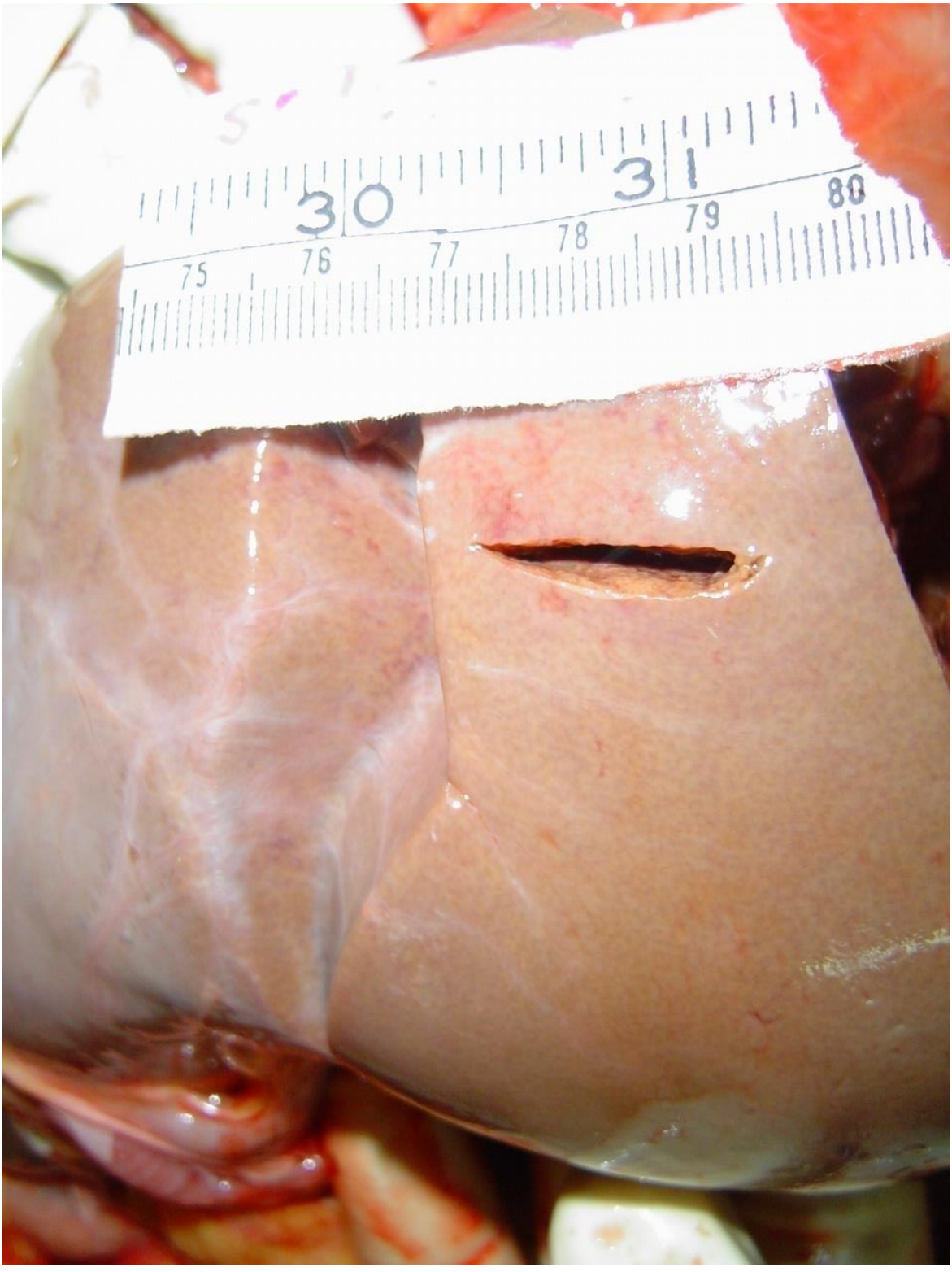
Penetrating injuries

- Impacts from flying missiles or from sharp weapon trauma
- Pneumothorax commonly associated
- Homicidal stab wounds are most frequently seen in the chest
- Stab injuries to the heart and the great vessels may not be rapidly fatal sometimes
- The wounds in the lower part of the chest may involve diaphragm, stomach spleen, liver and kidneys





HOMICIDAL STABS TO CHEST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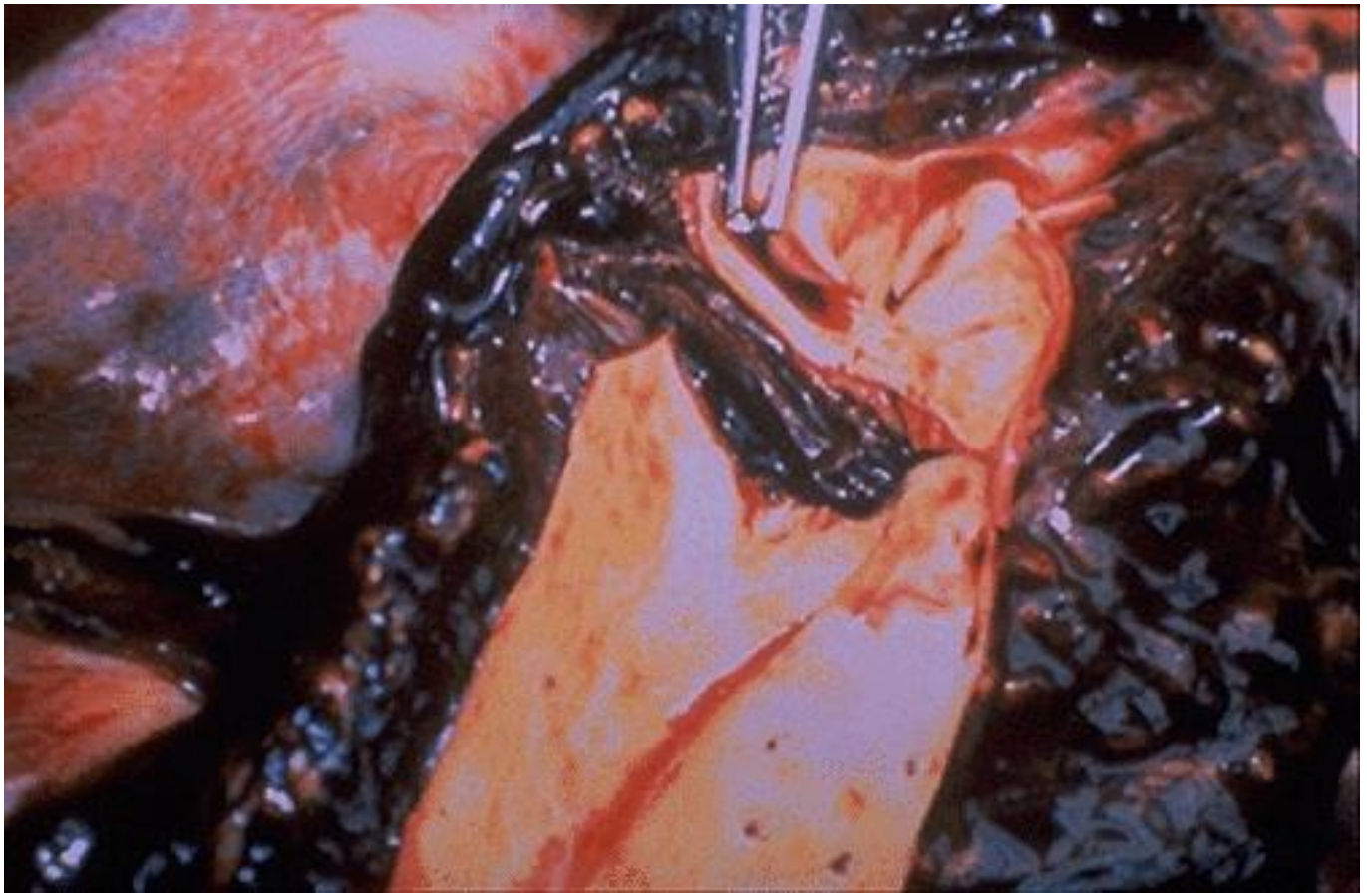
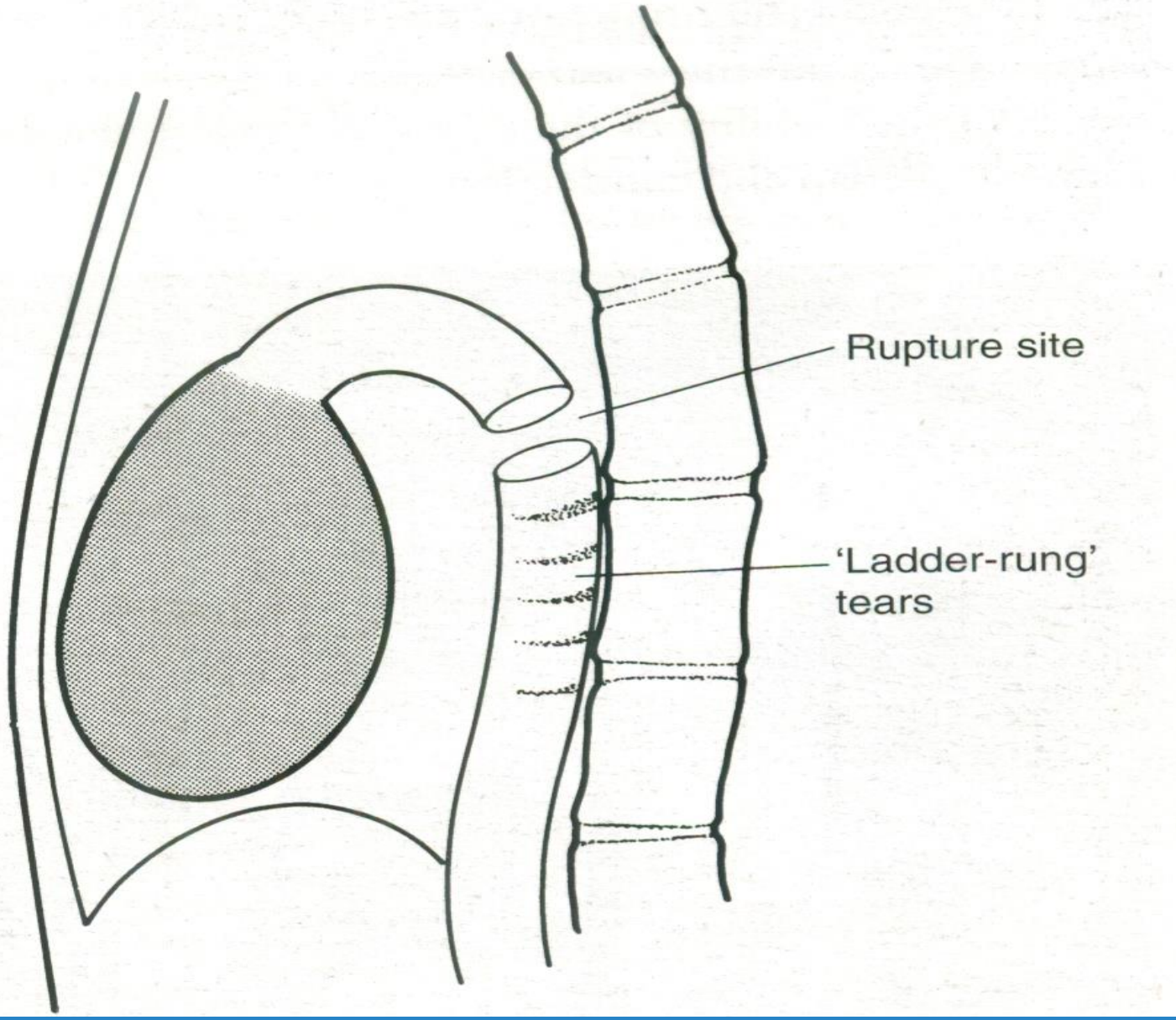
Deceleration injuries

When the thorax is suddenly decelerated the heart attempts to continue in the original direction



Sometimes a sudden deceleration injury in a vehicular accident produces a tear in the aorta.


Rupture site
'Ladder-rung' tears

High velocity blast wave

In organs where there is an air-tissue inter phase like the lungs, intestines etc, there is internal shearing effect to the tissues.

Haemorrhages in the alveoli followed by pulmonary oedema and ARDS.

Reference

- Knight's Forensic Pathology 4th edition
- Lecture Notes in Forensic Medicine Volume I
  By Dr. L.B.L.De Alwis
- Simpson's Forensic Medicine 13th Edition
- The pathology of trauma by JK. Mason