CRANIAL TRAUMA
INTRACRANIAL HEMORRHAGE

• Epidural/extradural hemorrhage
• Subdural hemorrhage
• Subarachnoid hemorrhage
• Intra cerebral hemorrhage
EPIDURAL HEMORRHAGE

• Acute
• Sub acute
  – Bleeding between Dura and skull
  – Always traumatic
  – Usual site is Parietotemporal area

• Never a contrecoup injury
ACUTE EPIDURAL HEMATOMA

• Rupture of middle meningeal artery
SUB ACUTE EPIDURAL HEMORRHAGE

• Dural sinus, middle meningeal veins, diploic veins
• Slow onset
• Lucid interval
• Rapid resolution
  – No expansion of clot
MEDICOLEGAL IMPORTANCE

• Prognosis is good with treatment
• Lucid interval (negligence)
• Resemble drunkenness
• Heat hematoma
SUBDURAL HEMATOMA

– Cortical vessels/Dural sinuses
– Bridging or communicating veins
• Acute
  – Signs evident within 24 hours
• Sub acute
  – 24 hours -7 days
• Chronic
  – Develop after 7 days
ACUTE SUBDURAL HEMATOMA

• Cortical artery / large bridging veins
  – Mobile
• Poor prognosis
SUB ACUTE SUBDURAL HEMATOMA

• Small bridging veins

Sudden death in alcoholics
CHRONIC SUBDURAL HEMATOMA

• Slowly develop
• Encased in membranes
• Re bleeding through vascular channels
• Recent lesions
• Old hematoma
GROSS APPEARANCE

• Within few hours
• 10-12 days
• 2nd week
• More than 3 weeks
• After one month

• Cellular infiltration
• Dark red to brownish color
• Discrete surface membrane
• Liquefaction of contents
• Firm capsule –cystic cavity (dark brown watery fluid)
DATING OF SUBDURAL HEMATOMA

• Capillary dilatation
• Proliferation of fibroblast
• Thin layer of fibrin
  – (fibroblastic and capillary proliferation
• Red cell decomposition
  – Pseudo membrane
• True inner membrane
• Appearance Connective tissue of mature
• Mature connective tissue

• 1st 24 hours
• 2-3 days
• 4-5 days
• 5-10 days
• 2-4 weeks
• After 4 weeks
• 1-3 months
SUBARACHNOID HEMORRHAGE

• Natural causes/trauma
• Laceration of vital arteries
  • Internal carotid artery, vertebral, basilar
• Natural causes
• Traumatic causes
  – Contusion/laceration
  – Explosive blast
  – Asphyxia
  – Fracture of cervical vertebra
  – Hyperextension of head during bronchoscopy

– Residual yellow brown staining of Pia /Arachnoid
  • Hemolysis turns CSF into xanthochromatic yellow
MEDICOLEGAL ASPECTS

- Ruptured berry aneurysm and trauma
- Subarachnoid hemorrhage and alcohol
Vertebral column and spinal cord
• Vulnerable areas
• Fracture of the spine

• Difficult to detect
• X-ray should be taken before autopsy
Spinal cord injuries

- Concussion
- Compression
- Pithing
- Laceration
Concussion

• Without external evidence of injury
  – Common form of injury in railway accidents and motor car collision
  – Railway spine
• Hyperextension is much more dangerous in causing spinal damage
• Momentary dislocation of c4-c6
• Contusion of spinal cord followed by self reduction
• At autopsy
  – Area of hemorrhagic discoloration on the surface or in the substance of the cord, or subthecal effusion of the blood
• Blow on the spine
  – Edema
  – Venous thrombosis
  – Softening of cord
Compression of spinal cord

- Fracture /dislocation of spine
  - C4-c6
  - T3-T6
  - T10-L3
• Pithing
  – Process of killing by small needle between
    • base of skull and first cervical vertebra
    • 2\textsuperscript{nd} and 3\textsuperscript{rd} cervical vertebra
• Laceration
  – Without external injury especially in children
  – Twisting and dislocation
  – Firearms