

اللَّهُمَّ صَلِّ وَسَلِّمْ عَلَى نَبِيِّكَ مُحَمَّدٍ وَعَلَى آلِهِ وَصَحْبِهِ أَجْمَعِينَ



# **Birth Injuries**

# Definition

The term *birth injury* is used to denote:  
avoidable and unavoidable  
mechanical, hypoxic and ischemic injury  
affecting the infant  
during  
labor and delivery.

# Definition

- Birth injuries may result from :

1. Inappropriate or deficient medical skill or attention.
2. They may occur, despite skilled and competent obstetric care.

# Incidence

Has been estimated at 2-7/1,000 live births.

## Predisposing factors:

1. Macrosomia,
2. Prematurity,
3. Cephalopelvic disproportion,
4. Dystocia,
5. Prolonged labor, and
6. Breech presentation.

# Incidence, Importance

- 5-8/100,000 infants die of birth trauma, and
- 25/100,000 die of anoxic injuries;  
Such injuries represent 2-3% of infant deaths.

# Cranial Injuries

# *Erythema, abrasions, ecchymoses,*

- Of facial or scalp soft tissues may be seen after forceps or vacuum-assisted deliveries.
- Their location depends on the area of application of the forceps.

# *Subconjunctival ,retinal hemorrhages and petechiae of the skin of the head and neck*

- All are common.
- All are probably secondary to a sudden increase in intrathoracic pressure during passage of the chest through the birth canal.
- Parents should be assured that they are temporary and the result of *normal* hazards of delivery.

# *Molding*

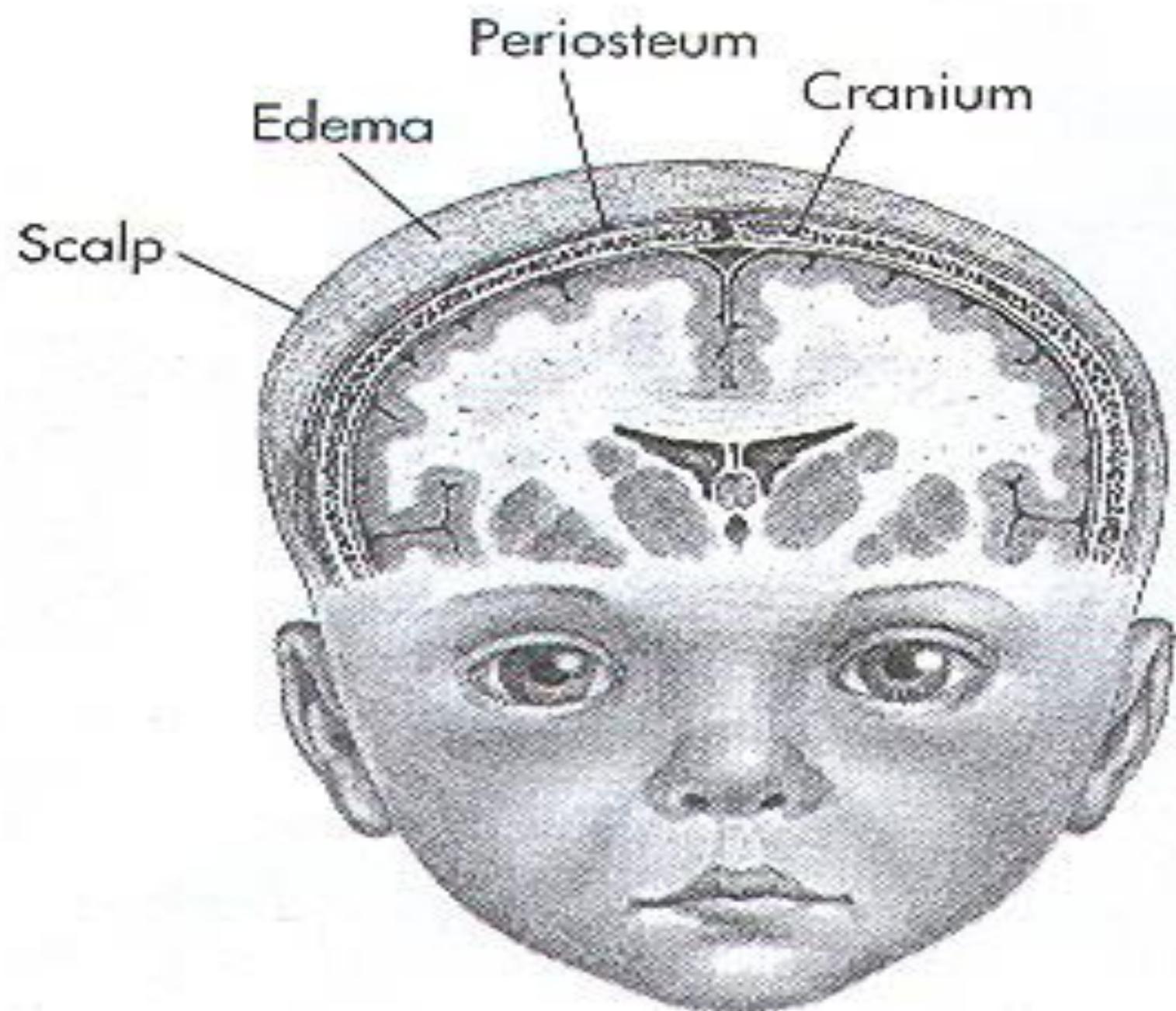
- **M**olding of the head and overriding of the parietal bones are frequently associated with caput succedaneum and become more evident after the caput has receded but disappear during the first weeks of life.
- **R**arely, a hemorrhagic caput may result in shock and require blood transfusion.

# *Caput succedaneum*

- **Diffuse**, sometimes ecchymotic, edematous swelling of the soft tissues of the scalp involving the portion presenting during vertex delivery.
- It may **extend** across the midline and across suture lines.
- The edema **disappears** within the first few days of life.

# *Caput succedaneum*

- Analogous swelling, discoloration, and distortion of the face are seen in face presentations.
- No specific treatment is needed, but if there are extensive ecchymoses, phototherapy for hyperbilirubinemia may be indicated.



# Caput succedaneum



# Cephalhaematoma

- It is a *subperiosteal* haematoma most commonly lies over one parietal bone.
- It may result from difficult vacuum or forceps extraction .

# Cephalhaematoma

## Management:

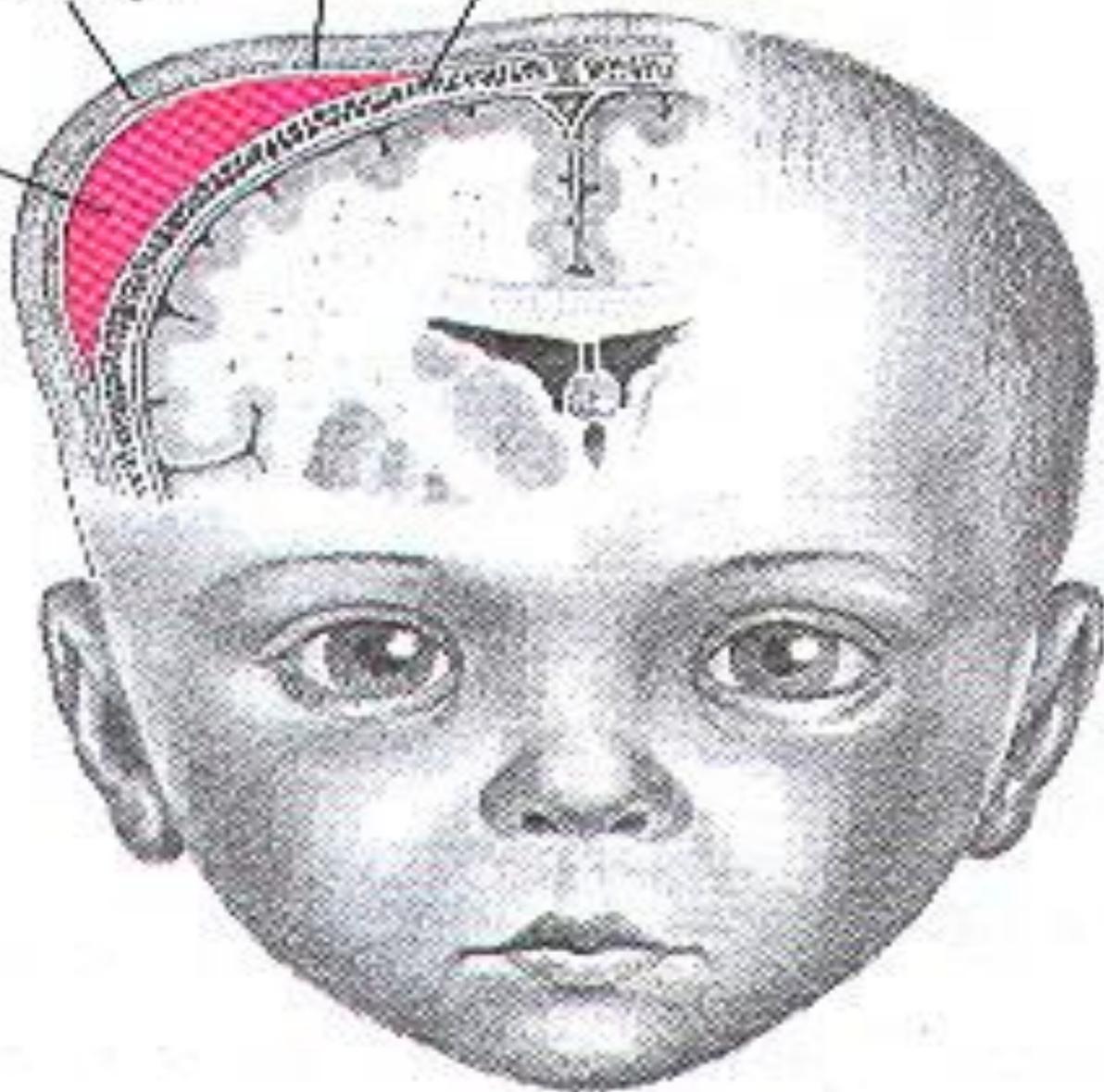
- It usually resolves spontaneously.
- Vitamin K 1 mg IM is given.

Hemorrhage

Scalp

Periosteum

Cranium



# Cephalhematoma Hematoma



# *Cephalohematoma*

- Most cephalohematomas are resorbed within 2 wk-3 mo, depending on their size.
- They may begin to calcify by the end of the 2nd wk.

# Diagnosis and Differential Diagnosis

## *Cephalhaematoma*

## *Caput Succedaneum*

Develops hours or days after birth.

Present at birth.

Localised haematoma to one bone limited by sutures at its edges.

Diffuse tissue oedema overlying more than one bone.

Well-defined edges.

Ill-defined edges.

Elastic, does not pit on pressure.

Soft, pits on pressure.

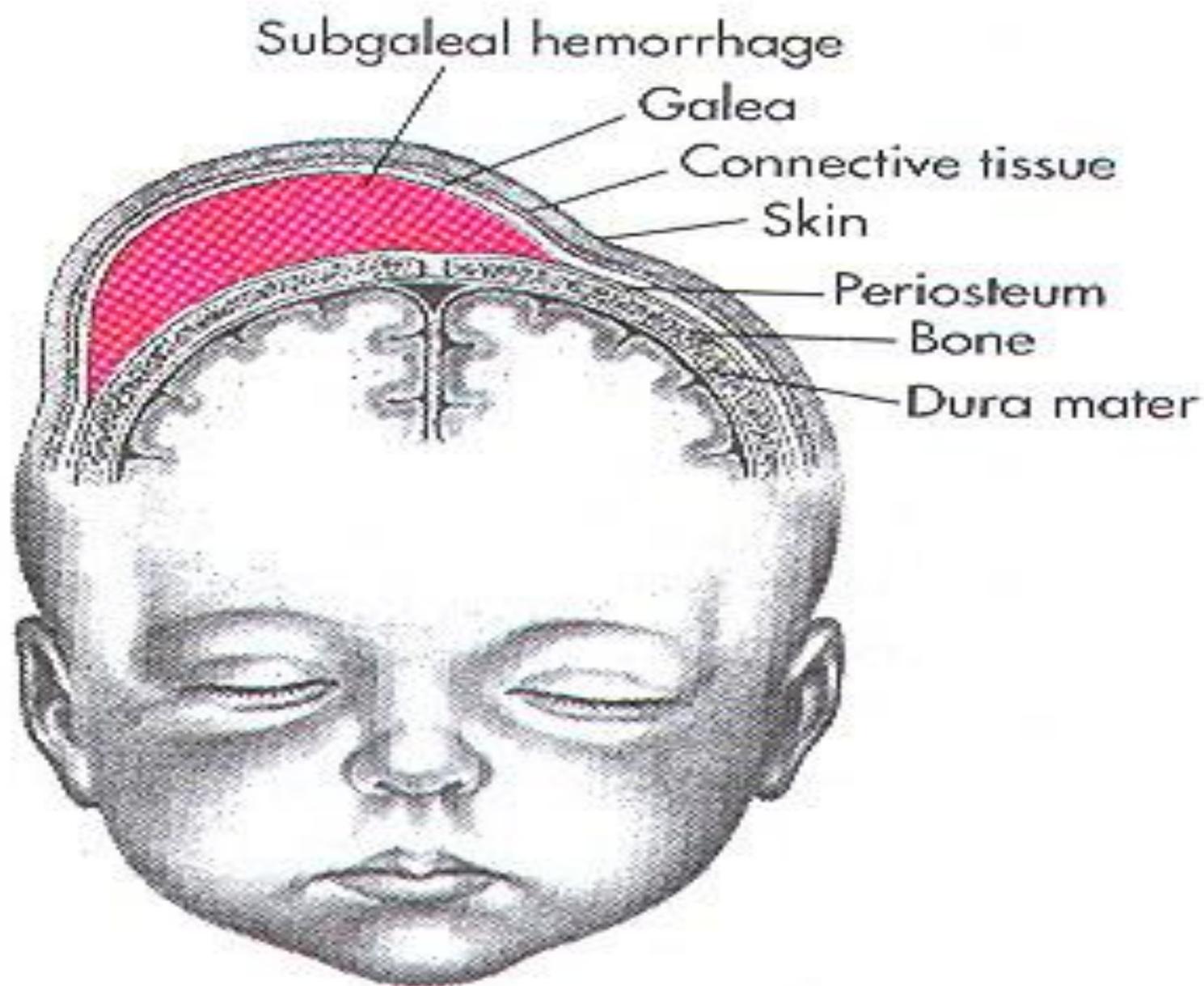
Disappears within few weeks.

Disappears within 1-2 days.

# Subgaleal hemorrhage

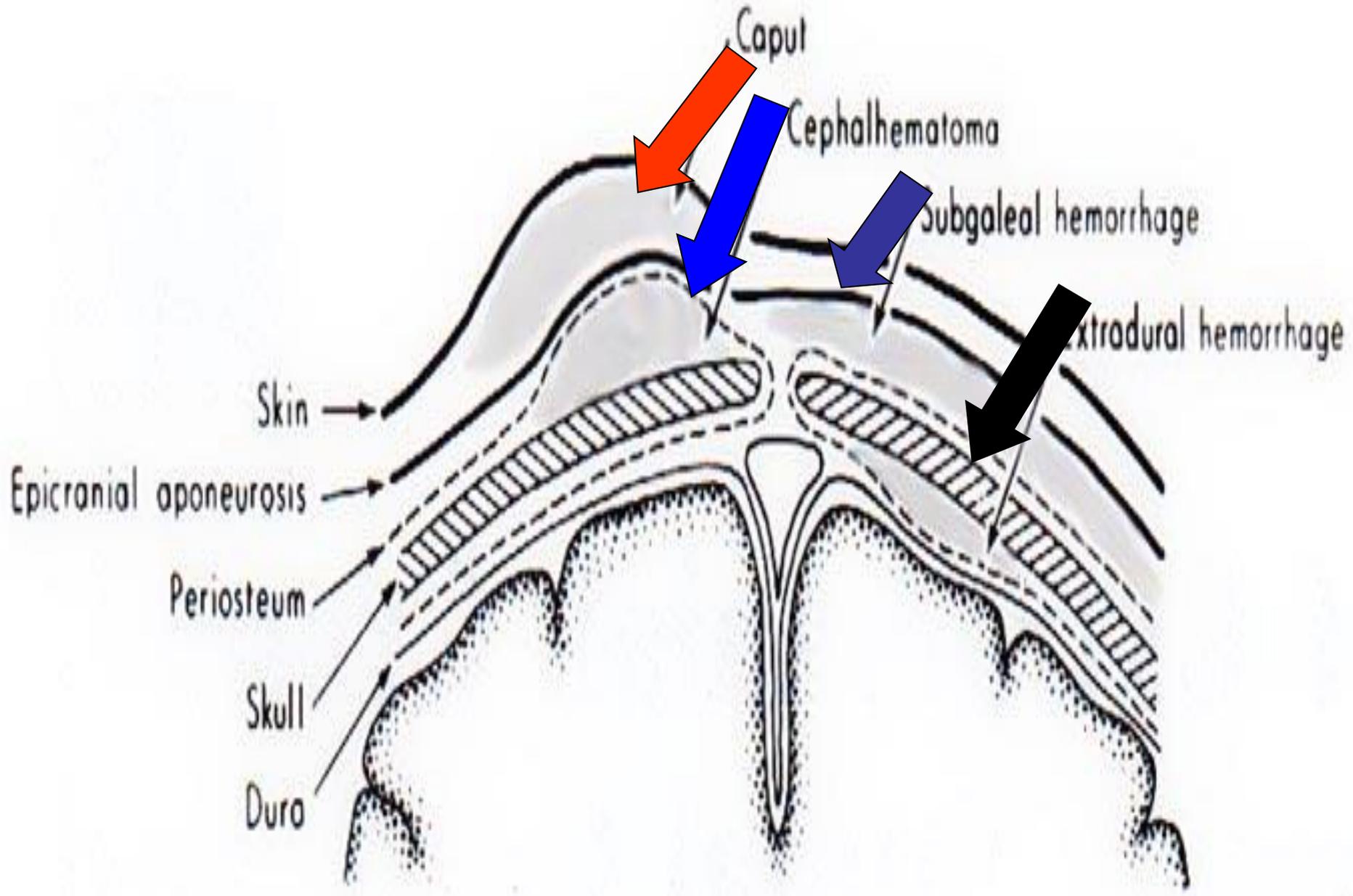
- Subgaleal hemorrhage is bleeding into the subgaleal compartment .
- This injury occurs as a result of pressure through the head ( of the infant) into the pelvic outlet.
- It is commonly occurred after vacuum delivery.
- The early detection is so vital .

- Serial head circumferences may detect any increase due to hemorrhage .
- The bleeding may extend to the posterior aspect of the ear and neck.
- Monitoring of the bleeding times and coagulation is important.
- Assessment to the level of consciousness.
- Assessment to the level of Hb and Hct.
- Increase in billirubin is expected due to blood lyses.



# Subgaleal hemorrhage





Intracranial-

Intraventricular

Hemorrhage

# Intracranial Haemorrhage:

## Causes:

1. Sudden compression and decompression of the head as in breech and precipitate labour.
2. Marked compression by forceps or in cephalopelvic disproportion.
3. Fracture skull.

# Intracranial Haemorrhage:

## Predisposing factors:

1. Prematurity due to physiological hypoprothrombinaemia, fragile blood vessels and liability to trauma.
2. Asphyxia due to anoxia of the vascular wall .
3. Blood diseases.

# Intracranial Haemorrhage Sites:

1. **Subdural** : results from damage to the superficial veins where the vein of Galen and inferior sagittal sinus combine to form the straight sinus.
  2. **Subarachnoid**: The vein of Galen is damaged due to tear in the dura at the junction of the falx cerebri and tentorium cerebelli.
  3. **Intraventricular** :into the brain ventricles.
  4. **Intracerebral** : into the brain tissues .
- In (1) and (2) it is usually due to birth trauma,
  - in (3) and (4) the foetus is usually a premature exposed to hypoxia.

# Intracranial Haemorrhage

## Investigations:

1. **U**ltrasound is of value.
2. **C**T scan is the most reliable.
3. **M**RI

# Intracranial Haemorrhage:

## Prophylaxis:

1. **Vitamin K:** 10 mg IM to the mother in late pregnancy or early in labour.
2. **Episiotomy:** especially in prematures and breech delivery.
3. **Forceps delivery:** carried out by an experienced obstetrician respecting the instructions for its use.

# Intracranial Haemorrhage Treatment

# Supportive

*Peripheral Nerve  
Injuries*

# Brachial Plexus Palsy:

**It is due to over traction on  
the neck as in:**

1. Shoulder dystocia.
2. After-coming head in breech delivery.

# Brachial Plexus Palsy:

## (1) Erb's palsy:

1. It is the common, due to injury to C5 and C6 roots.
2. The upper limb drops beside the trunk, internally rotated with flexed wrist  
(policeman's or waiter's tip hand).

# Brachial Plexus Palsy:

## (2) Klumpke's palsy:

- It is less common,
- Due to injury to C7 and C8 and 1st thoracic roots.
- It leads to paralysis of the muscles of the hand and weakness of the wrist and fingers' flexors.

# Brachial Plexus Palsy:

## Treatment

- Support to prevent stretching of the paralyzed muscles.
- Physiotherapy: massage, exercise and faradic stimulation.

# DELIVERY OF FETAL HEAD WITH SUBSEQUENT SHOULDER DISTOCIA

LEGS ARE BROUGHT UP TO CHEST AND PRESSURE IS APPLIED TO FUNDUS OF UTERUS

UTERUS

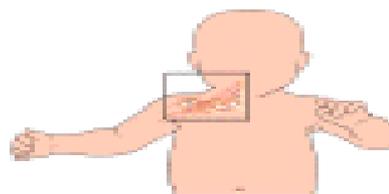
PRESSURE APPLIED ABOVE PUBIC BONE

EXCESSIVE PRESSURE IS APPLIED TO BABY'S HEAD

SHOULDER IS CAUGHT BEHIND PUBIC BONE

POST-DELIVERY CONDITION

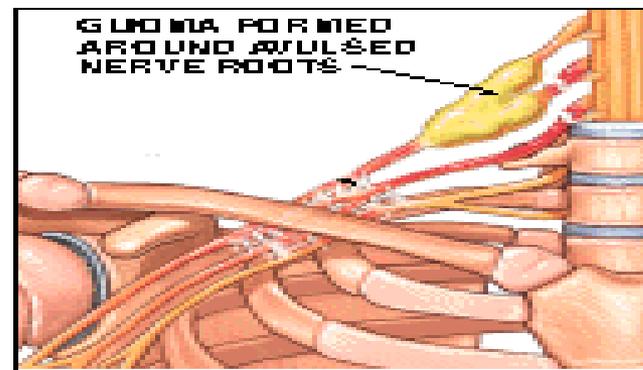
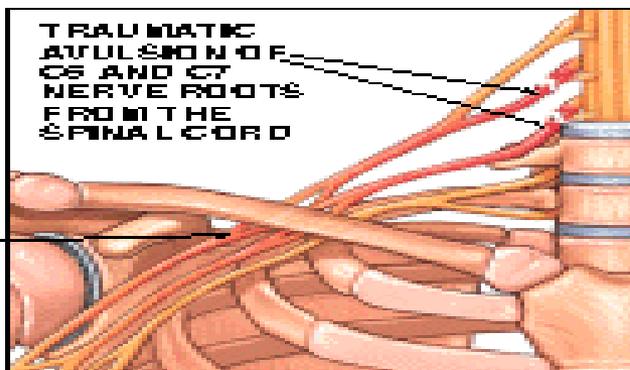
SUBSEQUENT CONDITION



BRACHIAL PLEXUS NERVES ARE DENNATED

TRAUMATIC AVULSION OF C6 AND C7 NERVE ROOTS FROM THE SPINAL CORD

GLUIDMA FORMED AROUND AVULSED NERVE ROOTS



# BRACHIAL PALSY

- Injury to the brachial plexus may cause paralysis of the upper arm with or without paralysis of the forearm or hand or, more commonly, paralysis of the entire arm.
- Approximately 45% are associated with shoulder dystocia.

# BRACHIAL PALSY

- These injuries occur in :

1. Macrosomic infants and when lateral traction is exerted on the head and neck during delivery of the shoulder in a vertex presentation,
2. When the arms are extended over the head in a breech presentation, or
3. When excessive traction is placed on the shoulders.

# In Erb-Duchenne paralysis

- The injury is limited to the 5th and 6th cervical nerves.
- The characteristic position consists of:  
(Adduction and internal rotation of the arm with pronation of the forearm).
- Moro reflex is absent on the affected side



# In Erb-Duchenne paralysis

- There may be some sensory impairment on the outer aspect of the arm.
- The power in the forearm and the hand grasp are **preserved** unless the lower part of the plexus is also injured;  
(the presence of the hand grasp is a favorable prognostic sign).

# Klumpke's paralysis

- Is a rarer form of brachial palsy;
- Injury to the 7th and 8th cervical nerves and the 1st thoracic nerve produces a paralyzed hand,

(Horner syndrome)

- If the sympathetic fibers of the 1st thoracic root are also injured :  $\longrightarrow$  paralyzed hand and ipsilateral ptosis and miosis.

# Klumpke



# *The prognosis*

- Depends on whether the nerve was merely **injured** or was **lacerated**.
- If the paralysis was due to edema and hemorrhage about the nerve fibers, function should **return** within a few months;
- If due to laceration, **permanent damage** may result.

# *Treatment*

If the paralysis persists without improvement for 3-6 months:

neuroplasty, neurolysis, end-to-end anastomosis, or nerve grafting

offers hope for partial recovery.

# PHRENIC NERVE PARALYSIS

- Phrenic nerve injury (3rd, 4th, 5th cervical nerves) with diaphragmatic paralysis must be considered when cyanosis and irregular and labored respirations develop.
- Such injuries, usually unilateral, are associated with ipsilateral upper brachial palsy.

# PHRENIC NERVE PARALYSIS

- *The diagnosis*  
is established by **ultrasonography or fluoroscopic examination**, which reveals elevation of the diaphragm on the paralyzed side
- There is **no specific treatment**:  
**infants should be placed on the involved side and given oxygen if necessary.**

# PHRENIC NERVE PARALYSIS

- **Recovery** usually occurs spontaneously by 1-3 months; rarely, surgical plication of the diaphragm may be indicated.

# Phrenic Nerve Injury



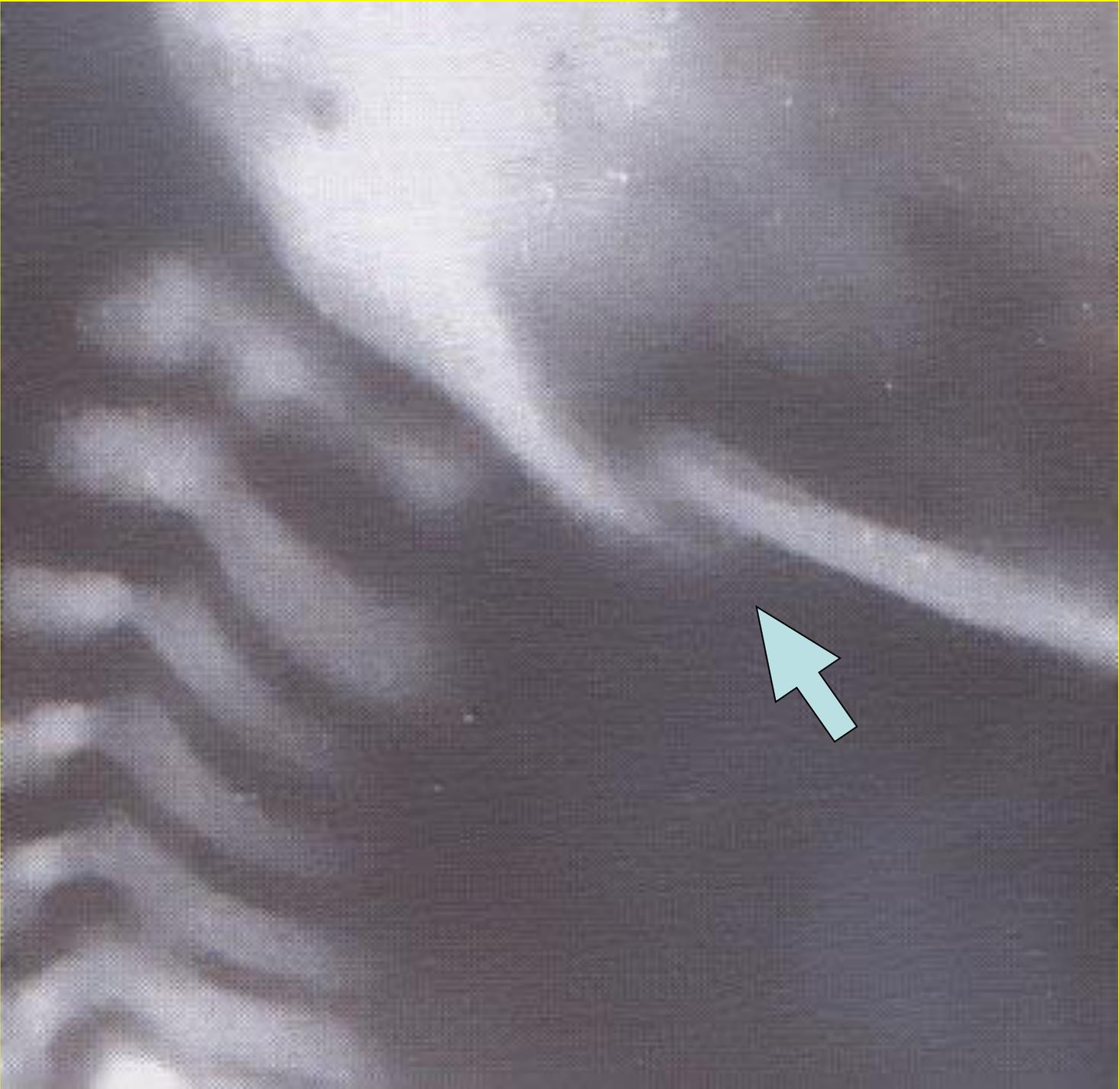
# CLAVICLE

This bone is fractured during labor and delivery

more frequently than any other bone;

It is particularly vulnerable when there is:

1. Difficulty in delivery of the shoulder in vertex presentations and of
2. The extended arms in breech deliveries.



# CLAVICLE

- The infant characteristically does not move the arm freely on the affected side;
- Crepitus and bony irregularity may be palpated, and
- Discoloration is occasionally visible over the fracture site.

# CLAVICLE

- *Treatment, consists of immobilization of the arm and shoulder on the affected side.*
- *A remarkable degree of callus develops at the site within a week and may be the first evidence of the fracture.*
- *The prognosis is excellent.*

# Spinal cord injuries

- Incidence
  - Unknown, possibility of some still-births resulting from upper cervical spinal injury
  - Cause from excessive traction (breech deliveries) or torsion (vaginal deliveries)
  - May happen in-utero
- Cause
  - Hemorrhage, stretch, transection of the cord

# Spinal cord injuries

- Presentation
  - Upper c-spine
    - Paralysis, severe respiratory depression
  - Lower c-spine
    - Hypotonia, some respiratory compromise
  - T-spine
    - Paraplegia, urinary and respiratory compromise

# Spinal cord injuries

- Management
  - Supportive measures
  - No role for laminectomy/surgery
  - Possible role for methylprednisolone
- Diagnosis
  - MRI
  - X-ray of the cervical and thoracic spines
- Prognosis
  - Very poor, dependent on the level/severity of the lesion

# Long bone fracture

- Complication associated with prolonged labor, difficult delivery
- Diagnosis
  - First sign may be cracking felt by obstetrician
  - Loss of motion of the extremity, pain on passive motion, swelling
  - X-ray of affected extremity
  - Rule out radial nerve compression in humeral head fractures

# Long bone fracture

- Treatment
  - Splinting
  - May require open reduction only in cases of non-approximation
- Prognosis
  - Great
  - Healing to cease immobilization sufficient in 8-10 days, complete recovery in 2-4 weeks

# Liver/Splenic rupture

- Very rare but deadly
- Presents from immediately postpartum – several days postpartum
- Risk factors
  - Pre/post dates, hepatomegaly, significant resuscitative efforts, difficult delivery requiring traction (breech, c-section)
- Presentation
  - Pallor, shock, vascular collapse, anemia, abdominal distention
  - May be insidious or fulminant
  - Hepatic bleed usually after rupture of hepatic hematoma (>4-5cm)

# Liver/Splenic rupture

- Diagnosis
  - Abdominal ultrasound showing free fluid
  - Paracentesis
- Treatment
  - Aggressive fluid/colloid resuscitation, coagulation correction (FFP, cryoprecipitate, platelets as needed)
  - Surgical repair

# Adrenal hemorrhage

- Increased risk with prematurity, asphyxia, neonatal neuroblastoma
- Presentation
  - Pallor, hypotension, shock, vomiting, diarrhea, fever, tachypnea, flank mass
- Diagnosis
  - Ultrasound, cortisol level (not diagnostic if low...)
- Treatment
  - Red cell transfusion, i.v. steroids

# I don't want a trauma

56/56

They'll thank you

