

SUBGALEAL HAEMORRHAGE (SGH)

RECOGNITION AND ASSESSMENT

Definition

- Accumulation of blood in the loose connective tissue of subgaleal space
- Damaged emissary veins connecting subgaleal space to the intracranial venous sinuses can lead to significant blood loss
- up to two-thirds of circulating volume with significant morbidity and mortality ($\geq 50\%$ in severely affected cases)

Risk factors

Vacuum extraction

- Incorrect positioning of cup
- cup marks on sagittal suture
- leading edge of cup < 3 cm from anterior fontanelle
- Prolonged extraction time (> 20 min)
- > 3 pulls or > 2 cup detachments
- Failed vacuum extraction

Maternal factors

- Nulliparity
- PROM > 12 hr
- Maternal exhaustion
- Prolonged second stage
- High or mid cavity forceps delivery

Neonatal factors

- Macrosomia
- Coagulopathy (vitamin K deficiency, Factor VIII or Factor IX deficiency)
- Low-birth-weight
- Male sex
- Low Apgar scores
- Resuscitation at birth
- Cord blood acidosis
- Fetal malpresentation
- Can occur in unassisted deliveries

Symptoms and signs

- Local signs
 - generalised swelling or boggy consistency of scalp
 - not limited by sutures
 - especially at the cup site
 - fluidic or leather-like pouch filled with fluid
 - elevation and displacement of ear lobes and periorbital oedema
 - irritability and pain on handling
- Systemic signs
 - hypovolemic shock
 - tachycardia
 - tachypnoea
 - dropping haematocrit
 - increasing lactate or worsening acidosis
 - poor activity
 - pallor
 - hypotension
 - acidosis
 - neurological dysfunction and seizures (late sign)
 - ischaemic end organ damage to liver or kidneys

- can manifest as worsening liver and renal function
- poor prognostic indicator

Profound shock can occur rapidly with blood loss into subgaleal space – the blood loss may not be apparent

Investigations

- FBC and coagulation on admission
 - repeat at clinical team's discretion
- Group and blood crossmatch (notify blood bank). See **Massive haemorrhage** guideline
- Venous/capillary gas including lactate and base excess, electrolytes (2–4 hrly)
- Maintain blood glucose level >2.6 mmol/L

DIFFERENTIAL DIAGNOSIS

- Cephalohematoma: subperiosteal bleeding limited by suture lines
- SGH: crosses suture lines
- Caput succedaneum: oedematous collection of serosanguinous fluid in the subcutaneous layer of the scalp
 - has distinct borders
 - does not enlarge
 - not fluctuant
- Chignon: artificial caput succedaneum limited to suction cap application site

IMMEDIATE TREATMENT

Initial management

- Follow local guidelines for monitoring of newborns following vaginal operative delivery
- Alert paediatric team
- Urgent review by registrar/consultant
- If SGH confirmed, admit to NNU immediately
 - inform consultant (if not involved in assessment)
- Apply pressure bandage to head
- Peripheral IV access
 - leave indwelling for 12 hr
- Continuously monitor:
 - heart rate
 - respiration
 - oxygen saturation
 - blood pressure (non-invasively if no arterial line) ≥ 24 hr
- Continue to assess capillary refill and peripheral perfusion
- Regularly observe and palpate scalp swelling to assess for:
 - continuing blood loss
 - change in head shape or circumference
 - measure head circumference hourly for the first 6–8 hr after birth
 - 1 cm increase in circumference = 40 mL blood loss
 - change in colour
 - displacement of ears
- Volume replacement:
 - inform consultant
 - see **Massive haemorrhage** guideline, and **Recognition of hypovolaemia** below
 - Group O RhD negative blood is immediately available on labour suite/obstetric theatres
- Monitor urine output
- Repeat FBC and coagulation studies (4–6 hr after initial assessment)
- Inotropes, vasopressors, multiple packed red cell transfusions and clotting products may be required for severe cases of shock [using packs 1 and 2 (see **Massive haemorrhage** guideline)]
- Ongoing assessment for jaundice

RECOGNITION OF HYPOVOLAEMIA

Signs of significant volume loss

- High/increasing heart rate (>160 bpm)
- Low/falling Hb or haematocrit
- Poor peripheral perfusion with slow central capillary refill (>3 sec)
- Low/falling blood pressure (mean arterial blood pressure <40 mmHg in term baby)
- Presence of, or worsening of, metabolic acidosis
- Consider echocardiography to assess volume status
- small systemic veins and low ventricular filling volumes can indicate hypovolaemia
- If any of above present, or concern of ongoing haemorrhage from scalp assessment/neurological dysfunction/evidence of renal or hepatic impairment – follow **Massive haemorrhage** guideline

Consider elective intubation and ventilation for worsening shock – blood is the priority over airway and breathing

CONCOMITANT INJURIES

- Hypoxic ischaemic encephalopathy [see **Hypoxic ischaemic encephalopathy (HIE)** guideline]
- Brain trauma resulting in cerebral oedema and/or intracranial haemorrhage
- Subdural haematoma
- Dural tear with herniation
- Superior sagittal sinus rupture
- Pseudomeningocele and encephalocoele
- Subconjunctival and retinal haemorrhage
- Elevated intracranial pressure from SGH mass effect
- Skull fractures

SUBSEQUENT MANAGEMENT

- If any of the intracranial concomitant injuries above suspected, neuroimaging to be undertaken once baby stabilised following discussion with radiologist to establish best modality
- Monitor on NNU for ≥24 hr
- Discuss with neurosurgical team