



SECTION: 9 HAEMATOLOGY

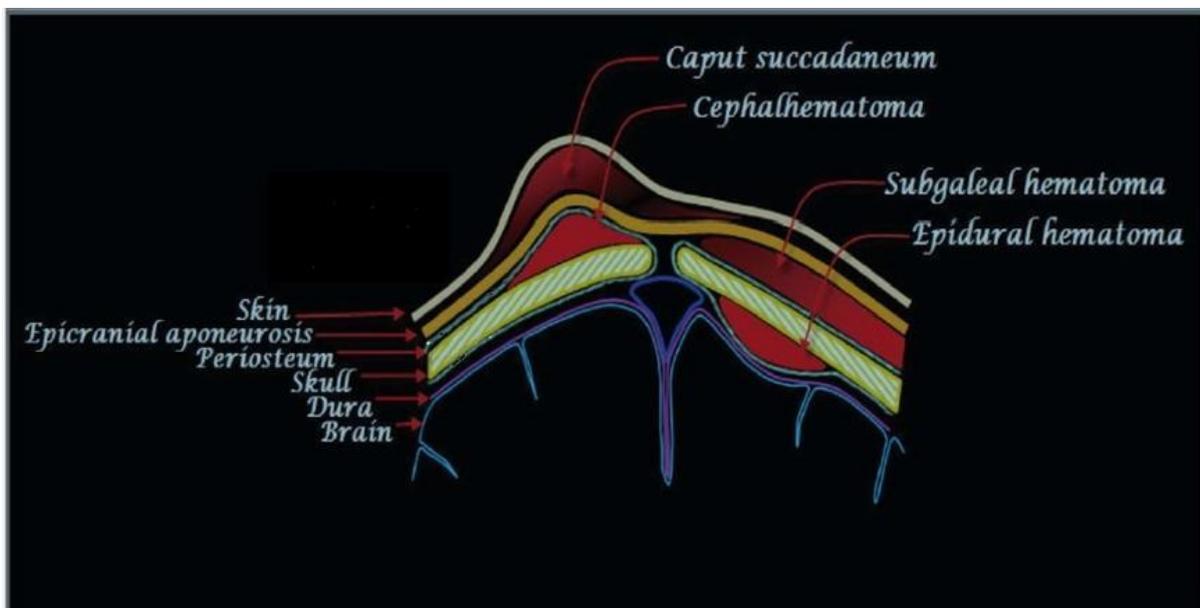
Subgaleal Haemorrhage (SGH): Detection and Management in the Newborn

Definition and Incidence

- Subgaleal haemorrhage (SGH) is an accumulation of blood in the loose connective tissue of the subgaleal space.
- Most catastrophic complication of instrumental delivery and, while rare, is associated with significant morbidity and mortality. Early recognition with a low threshold of suspicion is essential to initiate timely and effective management.

Background

- Naegele first described SGH in 1819.
- SGH can occur following normal birth, forceps delivery or Caesarean section, it most frequently occurs following vacuum assisted birth. The incidence has been estimated approximately as 1 in 2500 spontaneous vaginal deliveries without the use of vacuum or forceps, and a 10-fold increase is reported with the use of forceps. The rate of mortality is reported to be between 12–25%.



Differential diagnosis

- **Cephalohematoma:** SGH can be differentiated clinically from cephalohaematoma by the fact that it crosses suture lines.
- **Caput succedaneum:** This is an edematous collection of serosanguinous fluid in the subcutaneous layer of the scalp. It has distinct borders, doesn't enlarge and is not fluctuant. It is located where the vacuum was positioned, usually at the presenting part of the scalp. It typically resolves within 12–18 hours and there are no complications beyond a circular area of bruising.
- **Chignon (artificial caput succedaneum):** This is caused by a collection of interstitial fluid and small haemorrhages that occur under the vacuum cap. It may cross suture lines, is most obvious after immediate removal of the cap and is firm in consistency. It starts resolving within an hour of birth and should completely resolve within 18 hours. There is no long term significance for the newborn.

Risk factors

Vacuum extraction: SGH is often preceded by a difficult vacuum extraction with either incorrect positioning of the cup, prolonged extraction time (greater than 20 minutes), >3 pulls or > 2 cup detachments or failed vacuum extraction. Boo and colleagues also showed that nulliparity (adjusted OR 4.0), 5 minute Apgar score < 8, (OR 5.0), cup marks on the sagittal suture (OR 4.4), leading edge of cup < 3cms from anterior fontanelle (OR 6.0) or failed vacuum extraction (OR 16.4) were significant risk factors for SGH.

Other Risk Factors

- **Maternal factors:** PROM >12 hrs, Maternal exhaustion and prolonged second stage, high or mid cavity forceps delivery,
- **Neonatal factors:** Macrosomia, neonatal coagulopathy (Vitamin K deficiency, Factor VIII deficiency, Factor IX deficiency), low birthweight, male sex (2:1 to 8:1), low Apgar scores (<8 at 5 mins), need for resuscitation at birth and cord blood acidosis, foetal malpresentation.

Pathophysiology

- Tractional and rotational forces with the use of vacuum extraction can result in rupture of veins and haemorrhage into different layers of the scalp. Most significantly, SGH may result from rupture of emissary veins into the subgaleal space.

Recognition of SGH

Local signs

- Observation of the scalp by visual inspection alone rather than a combination of inspection and palpation can easily miss an SGH.
- SGH should always be considered if there a generalised swelling or a boggy consistency of the scalp, not limited by sutures, especially at the cup site. Palpation of the scalp has been described as fluidic or like a *leather pouch filled with fluid*.
- As the haemorrhage extends, elevation and displacement of the ear lobes and peri orbital oedema (puffy eyelids) can be observed. Irritability and pain on handling will be noted.

Systemic signs

- Signs consistent with hypovolemic shock: tachycardia, tachypnoea, dropping haematocrit on blood gases, increasing lactates or worsening acidosis, poor activity, pallor, hypotension and acidosis. Neurological dysfunction and seizures are a late sign. Ischemic end organ damage to liver or kidneys can manifest as worsening liver and renal function and this is a poor prognostic indicator.
- 6% of SGH cases are asymptomatic, 15–20% are mild, 40–50% are moderate and 25–33% are severe. Profound shock can occur rapidly with blood loss.

Initial action

(1) In the Delivery suite and postnatal wards

Administer intramuscular vitamin K as soon as possible.

- In the at-risk but asymptomatic neonate, RANZCOG recommend that cord pH, lactate, haematocrit/FBP and platelet count be taken at birth, as well as basic observations hourly for 2 hours and second hourly for 6 hours.



Action if there is a clinical suspicion of SGH.

- Urgent review by senior registrar or consultant paediatrician. If concerns about the possibility of SGH are confirmed, then these infants will be ***immediately admitted to the special care nursery.***

Immediate Investigations

- Full blood picture and Coagulation profile: On admission and repeated at clinical team's discretion. Up to 81% of neonates with SGH may develop coagulopathy.
- Group & blood x match (notify blood bank). [See Transfusion Medicine](#)
- Venous/capillary gas including lactate and base excess, electrolytes (2-4 hourly)
- Maintain blood glucose level > 2.6mmol/L

(2) In the neonatal nursery

The basis of effective management is aggressive resuscitation to restore blood volume, provide circulatory support, correction of acidosis and coagulopathy.

Above investigations to be carried out after insertion of a peripheral intravenous access, which should be left indwelling for 12 hours.

Ongoing monitoring

- Continuously monitor heart rate, respiration, oxygen saturation and blood pressure (non-invasively if no arterial line) at least for the first 24 hours.
- 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 head circumference (measure head circumference hourly for the first 6-8 hours of life), change in colour, displacement of ears.
- Volume replacement: 20ml/kg of normal saline, if severe hypovolemia, request for urgent O negative blood and FFP. [See Transfusion Medicine](#)
- Monitor urine output.
- Repeat FBC and coagulations studies, (4-6 hours after initial assessment).
- If coagulation studies are abnormal then correct with 20 mls/kg of Fresh Frozen Plasma. Consider giving Cryoprecipitate 5 mls/kg, if there is continued bleeding or the fibrinogen level are less than 1.5g/l. Discuss with on call haematologist about the need for use of recombinant factor VIIa.
- If thrombocytopenic, consider platelet transfusion (if platelet count<50)
- Inotropes, vasopressors and multiple packed red cell transfusions may be required for severe cases of shock.
- Ongoing assessment for jaundice.

Recognition of Hypovolaemia

Pointers to significant volume loss include

- A high or increasing heart rate (>160 bpm), low or falling haemoglobin or haematocrit, poor peripheral perfusion with slow capillary refill (>3 seconds), low or falling blood pressure (MBP<40 mmHg in a term baby), presence of or worsening of a metabolic acidosis.



- Consideration of a functional bedside echocardiography (by the attending neonatologist) can be useful in assessment of volume status. Small systemic veins and low ventricular filling volumes can be pointers to hypovolaemia.

Consider elective intubation and ventilation for worsening shock.

Look for concomitant injuries: Hypoxic ischaemic encephalopathy occurs in 62–72% of SGH. Brain trauma resulting in cerebral oedema and/or intracranial hemorrhage occurs in 33–40%. Less common associations include subdural hematoma, dural tear with herniation, superior sagittal sinus rupture, pseudomeningocele and encephalocele, and subconjunctival and retinal haemorrhage. Elevated intracranial pressure (ICP) from the SGH mass effect is reported. Skull fractures may be associated. Once stabilized, consider neuroimaging (cranial ultrasound or MRI).

Communication with Parents

- Keep parents informed and obtain consent for the administration of blood products.
- Reassure and keep communication open and honest.

(3) Implications for transport

- Assess and stabilize respiratory status
- Assess head and skull for abrasion, ecchymosis, and swelling
- Measure head circumference
- Obtain laboratory studies: blood gas, type and cross, FBP, and coagulation studies
- Establish intravenous access, umbilical lines when appropriate
- Identify availability of blood products
- Communicate status and plan of care with parents
- Communicate status with transport team and/or referral facility/physician
- Continue frequent assessment of vital signs, respiratory status, head examination, and laboratory studies including blood gases, hematocrit, base excess and electrolytes.

References:

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10. Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Prevention, Detection and Management of Subgaleal Haemorrhage in the Newborn Royal Australian and New Zealand College of Obstetricians and Gynaecologists. 2009. Available from: <http://www.ranzcog.edu.au/college-statements-guidelines.html> [accessed November 2015].

National Standards – 1- Care provided by the clinical workforce is guided by current best practice
7- Blood and blood products

Legislation - xxxxx

Related Policies - Nil

Other related documents – Transfusion Medicine Protocols: [Urgent Blood Transfusion Requests and Emergency Uncrossmatched Blood](#)

RESPONSIBILITY

Policy Sponsor	Neonatology Clinical Care Unit
Initial Endorsement	December 2015
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