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# PROGENY

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## **SUBGALEAL HEMORRHAGE (SGH) IN THE NEWBORN**

Subgaleal hemorrhage occurs most often as a result of traumatic delivery with a vacuum extraction device. In our hospital visits, the perinatal team has noted an increase in the number of vacuum-assisted cesarean deliveries and instrumented vaginal births. Concurrently, we have seen an increase in the number of cases of suspected subgaleal hemorrhage. SGH occurs when emissary veins that bridge the subgaleal space are damaged and bleed into the potential space between the galea aponeurotica (aponeurosis) and the periosteum or covering of the skull bones. This space can hold about 250mL of blood, potentially the entire blood volume of the newborn. Bleeding can extend from the eyes (orbital ridges) to the nape of the neck and laterally to the ears. It occurs gradually and may progress to massive hemorrhage resulting in disseminated intravascular coagulation, hypovolemic shock, multi-system organ failure, and death. Mortality rates as high as 25% have been reported. Subgaleal hemorrhage may not be apparent at birth and is commonly mistaken for a large caput succedaneum or cephalohematoma. The newborn may experience significant blood loss before hypotension and signs of hypovolemic shock are evident. Prognosis for these infants is totally dependent on early recognition of the signs of subgaleal hemorrhage and aggressive treatment. With this in mind, several Iowa hospitals have adopted protocols for increased monitoring of *all* infants delivered with a vacuum extractor or forceps intervention. It is rare, but subgaleal hemorrhage can occur in a non-instrumented vaginal birth. So, *any* infant with significant swelling, bruising and/or trauma to the head would also be subject to increased monitoring.

## **CLINICAL SIGNS**

- Scalp is edematous and “boggy,” swelling crosses suture lines
- Dependent swelling that shifts with positioning, usually progresses from base of neck to eyes to ears
- Discoloration of scalp and eyelids
- Fluctuating mass or fluid “wave,” distinguishes SGH from other scalp swellings
- Increasing head circumference: Robinson & Rossiter estimated that for every 1cm increase from the baseline measurement, 40mL of blood may be accumulated in the subgaleal space.
- Signs of hypovolemic shock: pallor, mottling of skin, poor perfusion with capillary refill >3 seconds, lethargy, hypotonia, hypotension, tachycardia, tachypnea, increased work of breathing, cyanosis, metabolic acidosis

- Signs of DIC: prolonged PT and PTT, reduced fibrinogen; decreased platelet count; increased fibrin/fibrinogen degradation products or D-dimers; bleeding from GI tract, GU or pulmonary systems; petechiae, bruising, purpura, bleeding or oozing from peripheral stick sites or umbilicus

### **SUGGESTED MONITORING GUIDELINES**

When there has been a difficult vacuum or forceps assisted delivery, The S.T.A.B.L.E.® Program recommends that the infant be observed for at least 8 hours, regardless of the Apgar score or need for resuscitation. Monitoring protocols in several Iowa hospitals include nursing assessment of the following *every hour for the first 8 hours of life*:

- Vital Signs: temperature, heart rate, respiratory rate, blood pressure
- Oxygen Saturation
- Scalp Assessment: location and characteristic of swelling, fluid “wave”, ecchymosis, discoloration
- Head Measurement: occipito-frontal circumference (OFC) and potentially nape to brow measurement
- Neurological Assessment: change in level of consciousness, decreased responsiveness, decreased muscle tone, apnea, irritability, seizures
- Perfusion Assessment: skin color and temperature, capillary refill, mottling
- Pain Assessment

In addition to these assessments, The S.T.A.B.L.E.® Program also recommends obtaining a baseline hemoglobin, hematocrit, and platelet count. These labs should be obtained shortly after birth.

### **MANAGEMENT AND TREATMENT**

If subgaleal hemorrhage is suspected, the infant should be transferred to the nearest tertiary center. Treatment for subgaleal hemorrhage often requires multiple transfusions of packed red blood cells, fresh frozen plasma, platelets, and cryoprecipitate to replace the circulating blood volume and manage the coagulopathy. If bleeding has progressed to the point of hypovolemic shock, the infant will require mechanical ventilation and aggressive treatment of the resulting metabolic acidosis. Inotropic support may be required to increase blood pressure and improve cardiac output. Seizures or suspected seizure activity is generally treated with Phenobarbital. A skull x-ray may be necessary to rule out fracture.

Historically, pressure bandages were used in an attempt to tamponade the bleeding externally. This therapy was found to be ineffective and was abandoned. Treatment goals aimed at restoring blood volume and treating the coagulation disorder are the means to reducing long term morbidity and mortality for the newborn with subgaleal hemorrhage.

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