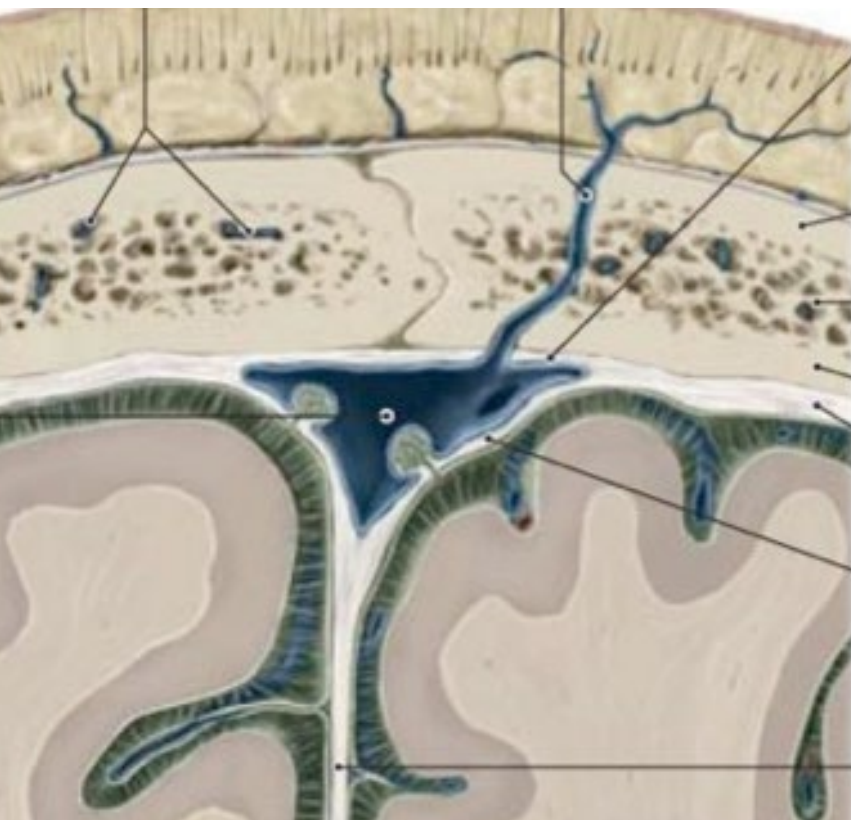


Neonatal subgaleal hemorrhage

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This male infant was born at term (GA 40 2/7 weeks of gestation, BW 3650 g) by vacuum assisted vaginal delivery. Apgar scores were 6, 6 and 7 at 1, 5 and 10 minutes, respectively. Umbilical arterial and venous cord pH values were 7.02 and 7.29, respectively. At 30 minutes of age, the infant was transferred to our institution because of tachypnea, pallor and a swelling on his head.

On admission, his vital signs were as follows: heart rate 156 bpm, blood pressure 48/28 mmHg (mean 34 mmHg), respiratory rate 92 breaths per minute, oxygen saturation 99% in room air. On his head, a large, fluctuant swelling was noted (see movie). Blood gas analysis revealed an uncompensated metabolic acidosis (pH 7.00, pCO₂ 5.9 kPa, base deficit -19.3 mmol/l). His hemoglobin value was 142 g/l and decreased to 120 g/l 12 hours later.

A diagnosis of hemorrhagic shock secondary to a subgaleal hemorrhage was made. The infant received a total of 40 ml/kg of crystalloid and improved rapidly. An ultrasound examination of his head was normal. He was transferred back to the maternity ward on the 4th day of life.

DISCUSSION

Subgaleal hemorrhage is a rare but potentially lethal condition in newborns. The prevalence of moderate to severe subgaleal hemorrhages is approximately 1.5 per 10'000 births. It is caused by rupture of emissary veins, which are connections between the dural sinuses and the scalp veins. Blood accumulates between the extracranial aponeurosis of the scalp and the periosteum. This potential space extends forward to the orbital margins, backward to the nuchal ridge and laterally to the temporal fascia (1). In term babies, this subaponeurotic space may hold as much as 260 ml of blood (which is almost equivalent to the baby's blood volume). Subgaleal hemorrhage can therefore lead to severe hypovolemia, and in one study up to one quarter of babies who require neonatal intensive care for this condition died (2).

Subgaleal hemorrhage is most often associated with vacuum extraction and forceps delivery, but it may also occur spontaneously. The table below summarizes the key features of caput succedaneum, cephalohematoma, and subgaleal hemorrhage (1).

Optimizing the outcome for babies with subgaleal hemorrhage requires early diagnosis, careful monitoring and prompt treatment of hypovolemic shock.

Feature	Caput succedaneum	Cephalohematoma	Subgaleal hemorrhage
Location	At point of contact; can extend across sutures	Usually over parietal bones; does not cross sutures	Beneath epicranial aponeurosis; may extend to orbits, nape of neck
Characteristic findings	Vaguely demarcated; pitting edema that shifts with gravity	Distinct margins; initially firm, more fluctuant after 48 h	Firm to fluctuant; ill-defined borders; may have crepitus or fluid waves
Timing	Maximal size and firmness at birth; resolves in 48-72 h	Increases after birth for 12-24 h; resolution over 2-3 weeks	Progressive after birth; resolution over 2-3 weeks
Volume of blood	Minimal	Rarely severe	May be massive, especially if there is an associated coagulopathy

Table

Distinguishing features of different neonatal extracerebral fluid collections (adapted from Davis DJ (1)).

REFERENCES

1. Davis DJ. Neonatal subgaleal hemorrhage: diagnosis and management. CMAJ 2001;164:1452-1453
2. Chadwick LM, Pemberton PJ, Kurinczuk JJ. Neonatal subgaleal haematoma: associated risk factors, complications and outcome. J Paediatr Child Health 1996;32:228-232 (*Abstract*)

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