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Introduction

A cephalohematoma is an extracranial hematoma between the periosteum and the bone. It occurs secondary to birth trauma. In rare cases it may occur in the absence of any trauma. Cephalohematoma do not cross suture lines. It usually occurs in 1-2% of deliveries. It usually self-resolves in 2-8 weeks. The most common complication of cephalohematoma is hyperbilirubinemia, anemia or bone fracture.

Infected cephalohematoma usually occurs due to trauma, bacteremia or meningitis. In rare cases, infected cephalohematomas can also be associated with epidural abscess, osteomyelitis.

This is a rare case of infected cephalohematoma with meningitis and underlying osteomyelitis. From 1925 to 2011 there have been 17 cases of infected cephalohematoma reported. Only one of them had associated osteomyelitis and three were associated with meningitis.

HPI

Mother presented to the ED with a one-month-old male infant with irritability over the past two days and a rectal temperature of 100.4F within the past two hours. He is currently breastfed with no decrease in appetite. Mother denies any head trauma, rhinorrhea, cough, difficulty breathing, foul smelling urine, decrease in wet diapers, or neurologic abnormalities.

He was born full term via spontaneous vaginal delivery to a 30-year-old G2P2 mother, who was GBS negative with no history of HSV or HIV. Labor and delivery were unremarkable.

He is not currently on any medication and has no known allergies. He does not go to day care.

Objectives

Physical Exam

Vitals: WNL except for a rectal temperature of 100.4F

General Appearance: Alert and breastfeeding. He was very irritable anytime he was touched during the exam.

Head: Normocephalic, atraumatic, right tender non-fluctuant hematoma on parietal bone that did not cross suture lines. Mother reported that it was present two days after birth and three weeks prior to presentation in the ED.

The rest of the physical exam was otherwise unremarkable.

Labs

CBC with differential, BMP, U/A, and respiratory virus panel were unremarkable.

Procalcitonin and CRP were 2.10 and 14.7 respectively.

CSF cell analysis was not done due to bloody tap.

Urine and blood culture were negative.

CSF culture grew E.coli

Patient was started on empiric antibiotics prior to the CSF, blood, and urine culture results.

Day 2

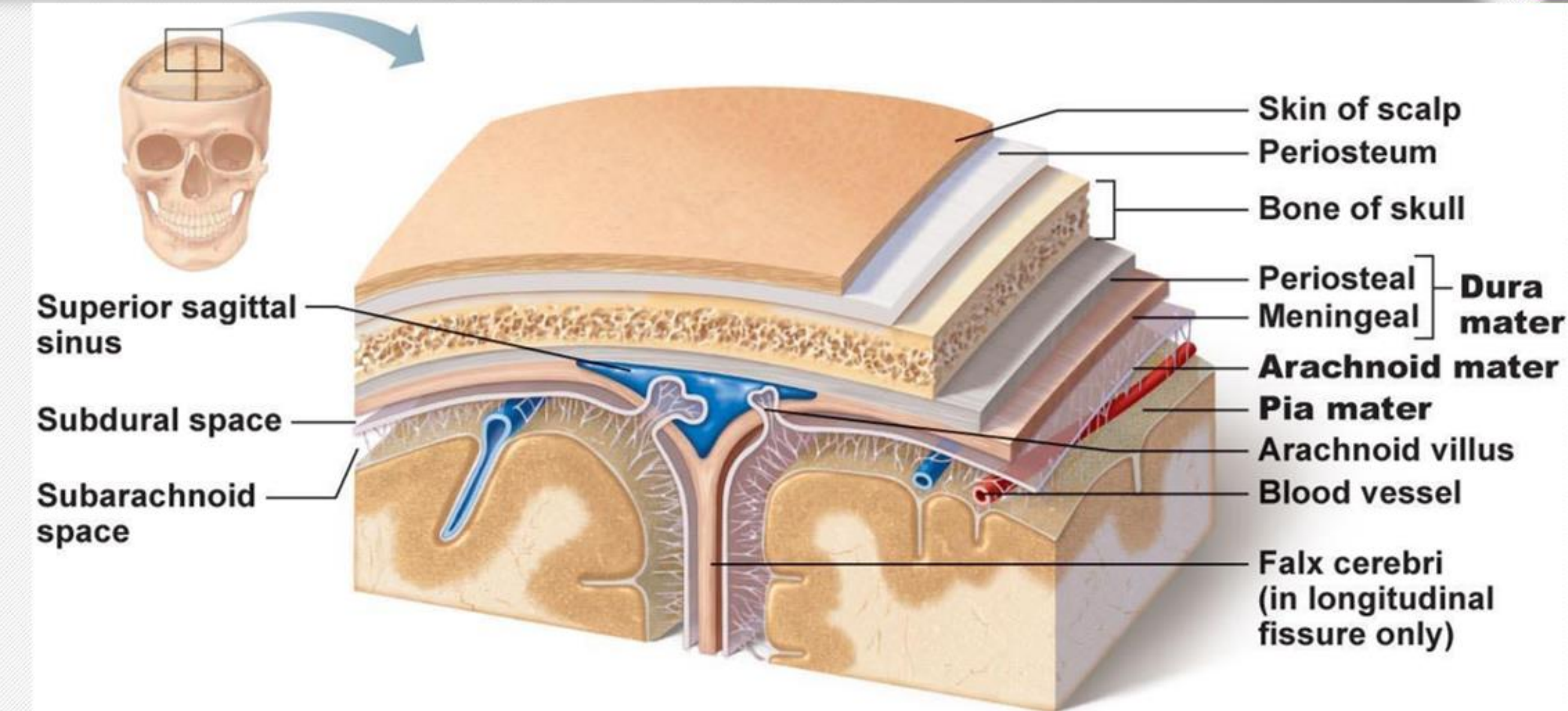
Patient remained febrile and irritable despite empiric treatment for more than 24 hrs.

Head CT with and without contrast was ordered and showed osteomyelitis and bony destruction of the right parietal bone with abscess.

Patient was transferred to tertiary center for further management.

Abscess was drained and osteomyelitis was successfully treated with parenteral antibiotic for 28 days.

Layers of the Scalp and Skull



Neonatal Extracranial Injuries

Caput Succedaneum

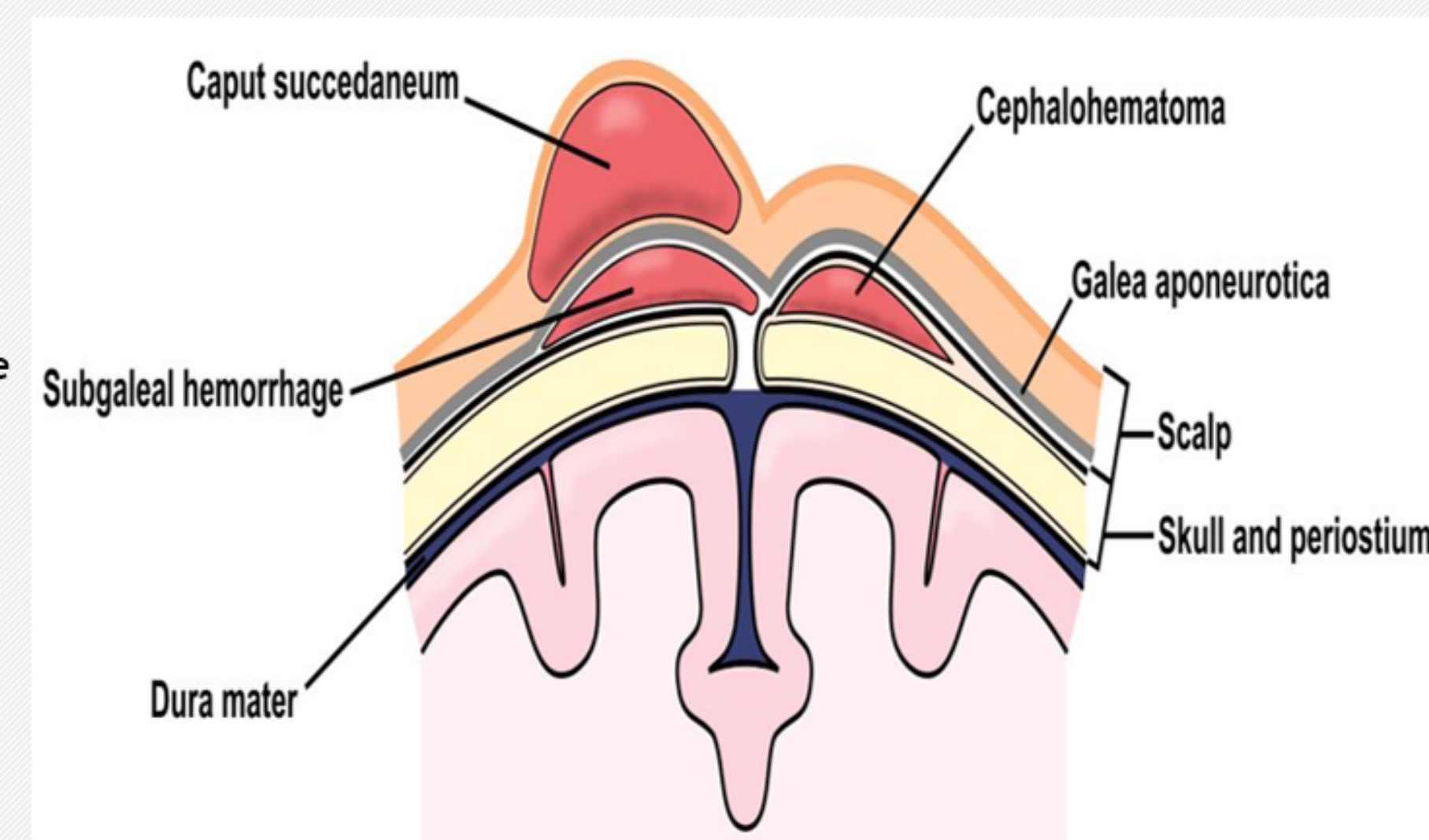
- Soft tissue edema
- **Crosses suture lines**
- Present at birth
- Resolves within 48hrs

Subgaleal Hemorrhage

- Bleeding between the galea aponeurotica and the bone
- **Crosses suture lines**
- Present at birth
- Might need to replace blood loss

Cephalohematoma

- Bleeding between the periosteum and the bone
- **Does not cross suture lines**
- Might be present at birth or appear days later
- Takes 2-8 weeks to resolve.



Discussion

This patient was born via uneventful spontaneous vaginal delivery. His cephalohematoma happened spontaneously a couple days after birth. His infected cephalohematoma occurred with both meningitis and underlying osteomyelitis. This is a very rare occurrence. The isolated organism from the CSF, purulent drainage from the cephalohematoma and bone debridement was E. coli.

E. coli is the most likely organism in these cases because there is evidence that a neonate's immune system is unable to mount an effective response against E. coli during the newborn period due to decreased IgA levels or absence of it. Intestinal organisms can also enter the systemic circulation via the digestive system.

In this case, there was no trauma, so the infection likely occurred hematogenously. The cephalohematoma became infected due to the clot providing a medium for bacterial growth. The infected cephalohematoma caused osteomyelitis with destruction of the parietal bone. The underlying osteomyelitis caused meningitis. The sequence of infection could have occurred in reverse, but it is unlikely in this case because patient would have presented much earlier with symptoms if meningitis was the initial infection. The hematogenous transmission is possible even if there was no bacteremia.

Patient did improve after debridement of the necrotic bone and further improved with parenteral antibiotics. The treatment of choice for infected cephalohematoma is debridement, drainage and parenteral antibiotics. To date the duration for antibiotic treatment has not been established. This patient was treated with antibiotics for 28 days with success. In the literature there have been longer courses of treatment, up to six weeks.

Conclusion

Cephalohematoma occurs in 1-2% of births.

It usually occurs in prolonged labors, vacuum, or forceps assisted deliveries. A small percentage occur spontaneously without birth trauma.

Most cephalohematomas have a benign course but some may have a complicated course as illustrated by this patient. In addition, as in this case, trauma is not necessary for infected cephalohematomas to occur.

It is very important that clinicians are aware of signs and symptoms of infected cephalohematomas which include: cephalohematomas that failed to resolve within 4-6 weeks, tenderness, redness, warmth or any other signs of sepsis.

Once an infected cephalohematoma is suspected, patients should undergo a sepsis workup with head CT to rule out abscess and osteomyelitis. They should also be referred promptly to neurosurgery for aspiration, debridement of the cephalohematoma and parenteral antibiotics.

References

Goodwin, M., Persing, J., Duncan, C., Shin, J. (2000) 'Spontaneously Infected Cephalohematoma: Case Report and Review of the Literature', *The Journal of Craniofacial Surgery*, 11(4), pp. 371.

Kao, H.C., Huang, Y.C., Lin, T.Y (1999) 'Infected Cephalohematoma Associated With Sepsis and Skull Osteomyelitis: Report of One Case', *American Journal of Perinatology*, 16(9), pp. 459.