AMSER Case of the Month: September 2018

9 month-old male presenting to the ED with increasing extracranial soft tissue swelling following a fall

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Patient Presentation

- 9 month-old male
- 1 day history of increasing extracranial soft tissue swelling following a fall after being dropped by his 14 year old sister
- No neurologic deficits, no loss of consciousness, no vomiting
- PMH: None
- PSH: None
- Fam Hx: No pertinent
- Medications: None
- Allergies: NKA

Pertinent Labs

- Hgb: 9.2 g/dL
- Hct: 26.6%
- Na: 143 meq/L
- K: 4.0 meq/L
- Cl-: 109 meq/L
- HCO3: 19 meq/L
- Anion Gap: 15 meq/L
- Glucose: 128 mg/dL

What Imaging Should We Order?

ACR Appropriateness Criteria

Clinical Condition: **Head Trauma — Child**

Variant 3: **Moderate or severe head injury (GCS ≤13) or minor head trauma with high-risk factors (eg, altered mental status, clinical evidence of basilar skull fracture). Excluding nonaccidental trauma.**

Radiologic Procedure	Rating	Comments	RRL*
CT head without IV contrast	9		☢☢☢
MRI head without IV contrast	7		O
MRA head without IV contrast	4	Consider this procedure if vascular injury is suspected.	O
CTA head with IV contrast	4	MRA is preferred to this procedure. CTA may be used for problem solving.	☢☢☢☢
MRA head without and with IV contrast	3		O
X-ray head	2		☢
CT head without and with IV contrast	2		☢☢☢☢
CT head with IV contrast	2		☢☢☢
MRI head without and with IV contrast	2		O
Arteriography cerebral	2		☢☢☢☢
US head	1		O
FDG-PET/CT head	1		☢☢☢☢
Tc-99m HMPAO SPECT head	1		☢☢☢☢
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

This imaging modality was ordered by the ER physician

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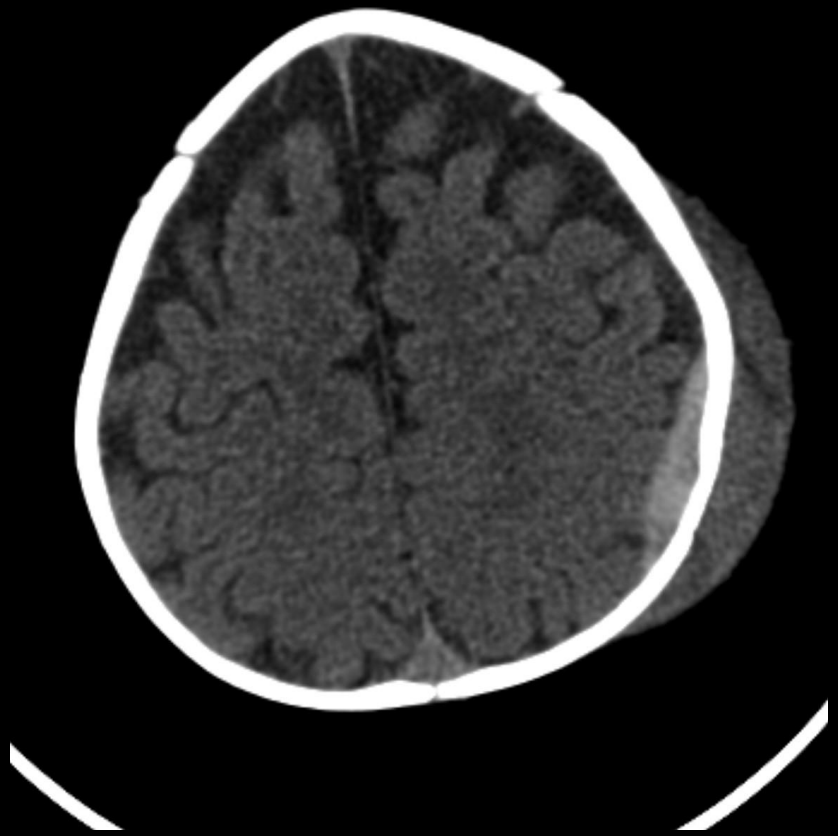
Findings: (unlabeled)



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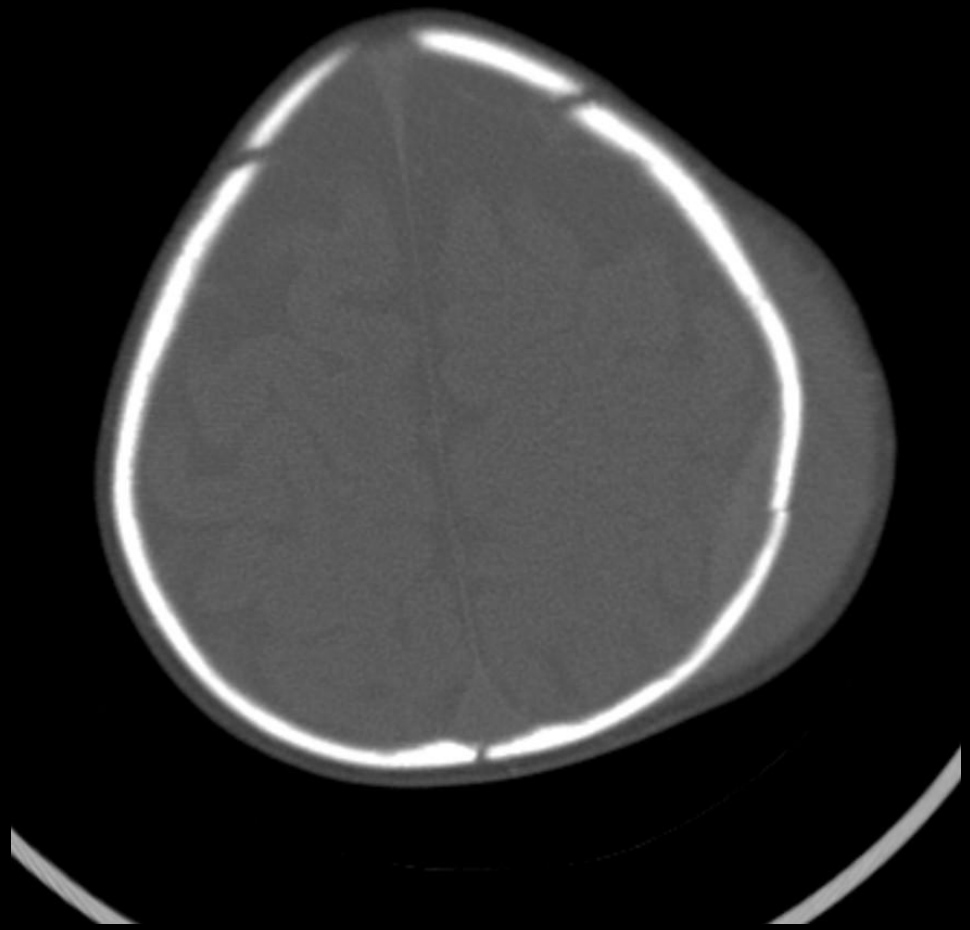

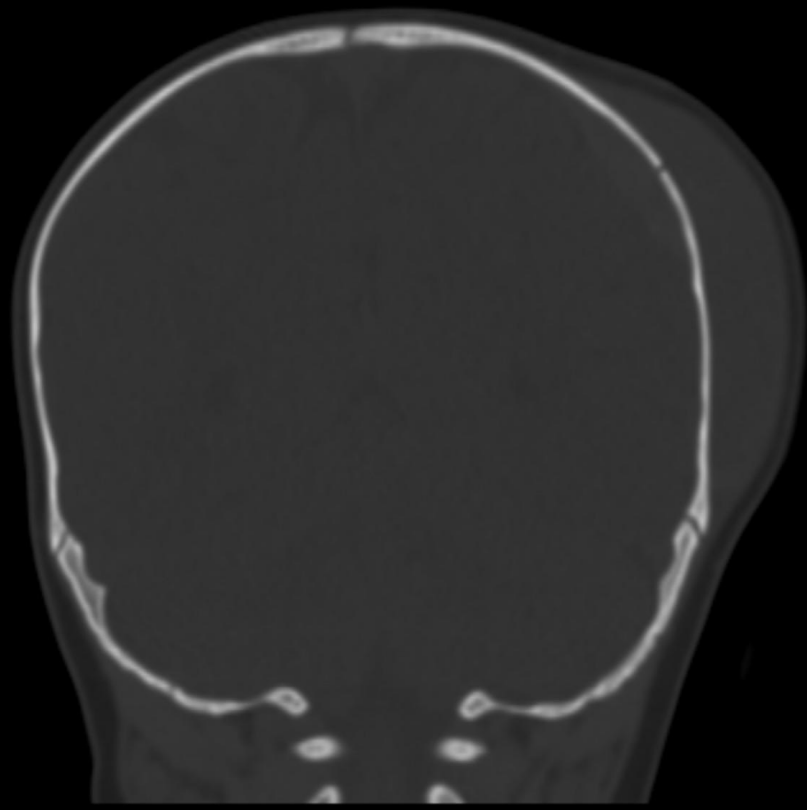

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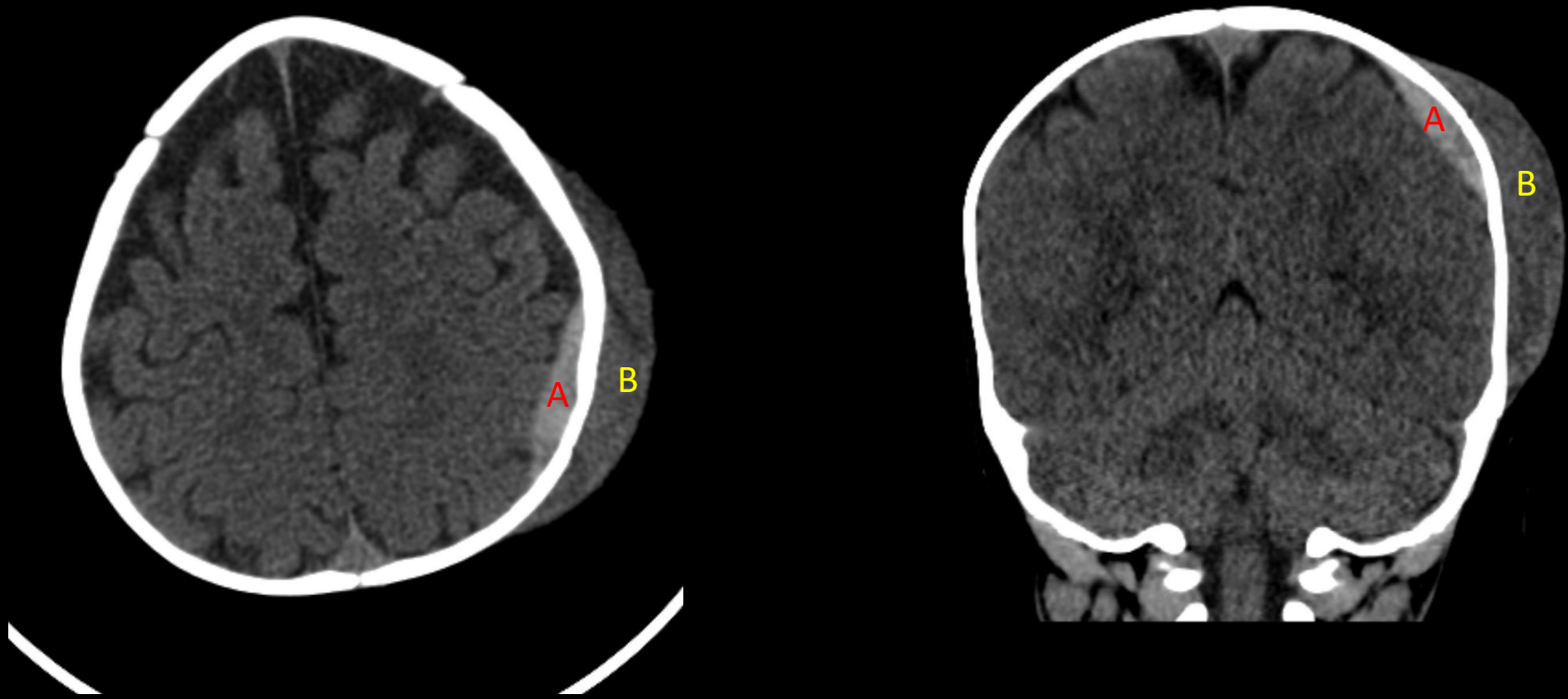
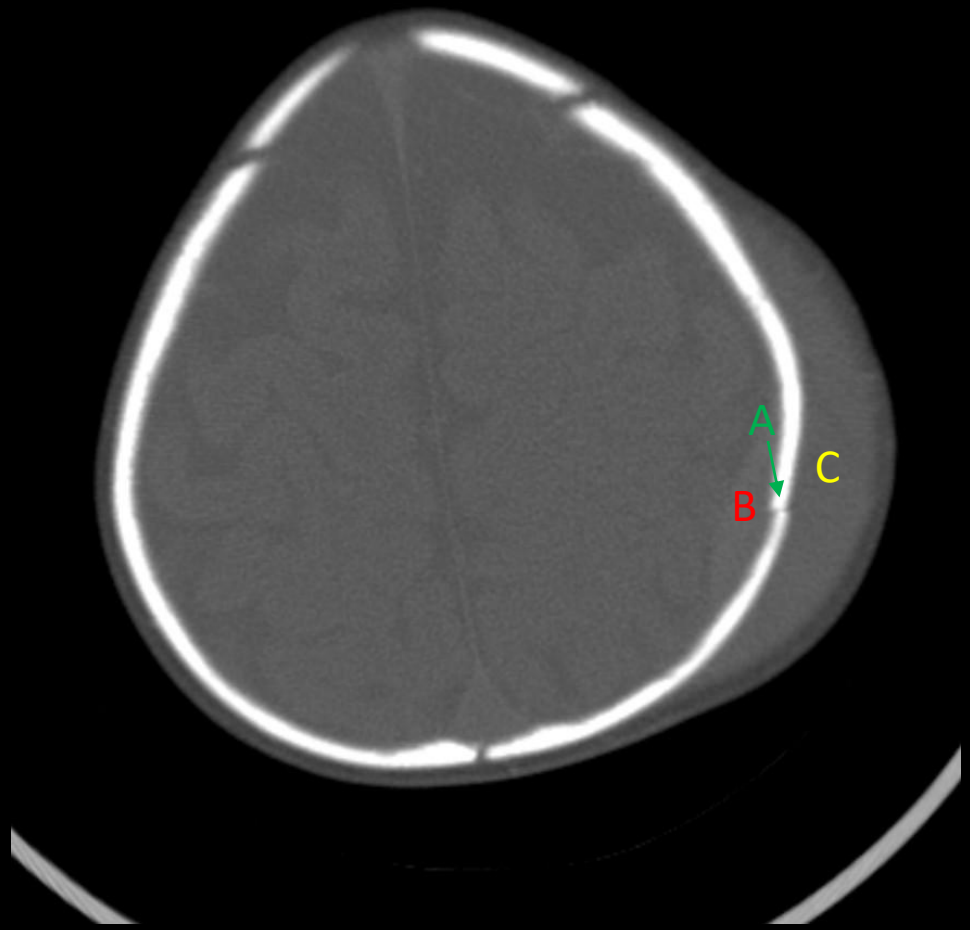
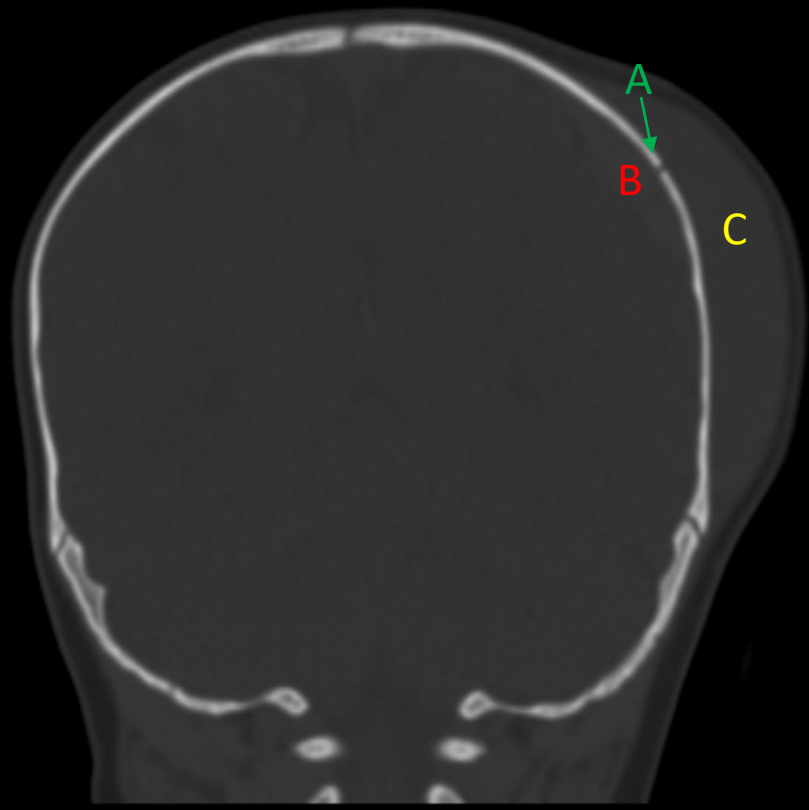


Axial and coronal soft tissue window images show biconvex hyperdensity, consistent with epidural hematoma (A), in the left parietal convexity. Overlying scalp swelling (B) is noted.

Findings: (labeled)





Axial and coronal bone window images show linear undisplaced fracture of the left parietal bone (A) overlying the epidural hematoma (B). Overlying marked scalp swelling (C) is again noted.

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Final Dx:

Nondisplaced left parietal bone fracture with overlying left parietal epidural hematoma and subgaleal scalp hematoma

Linear Skull Fractures in Infants

- Definition: Single fracture line that involves full thickness of the skull and can disrupt underlying vascular structures.

- Parietal bone, like our patient, is the most common location
- 15-30% are associated with traumatic brain injury

- Complications (majority heal without complication):
  - Most common is subgaleal hematoma
  - Epidural hematoma
- Indications for neurosurgical evaluation:
  - Linear skull fractures with >3 mm separation
  - Signs of intracranial injury

References

Schutzman SA, Greenes DS. Pediatric minor head trauma. Ann Emerg Med. 2001 Jan;37(1):65-74. Review. PubMed PMID: 11145776.

https://www.uptodate.com/contents/skull-fractures-in-children-clinical-manifestations-diagnosis-and-management

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