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?
This imaging modality was ordered by the ER physician

ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Clinical Condition:</th>
<th>Head Trauma — Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variant 3:</td>
<td>Moderate or severe head injury (GCS ≤13) or minor head trauma with high-risk factors (e.g., altered mental status, clinical evidence of basilar skull fracture). Excluding nonaccidental trauma.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Radiologic Procedure</th>
<th>Rating</th>
<th>Comments</th>
<th>RRL*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT head without IV contrast</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRI head without IV contrast</td>
<td>7</td>
<td></td>
<td></td>
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<tr>
<td>MRA head without IV contrast</td>
<td>4</td>
<td>Consider this procedure if vascular injury is suspected.</td>
<td>O</td>
</tr>
<tr>
<td>CTA head with IV contrast</td>
<td>4</td>
<td>MRA is preferred to this procedure. CTA may be used for problem solving.</td>
<td>O</td>
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<tr>
<td>MRA head without and with IV contrast</td>
<td>3</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>X-ray head</td>
<td>2</td>
<td></td>
<td>O</td>
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<tr>
<td>CT head without and with IV contrast</td>
<td>2</td>
<td></td>
<td>O</td>
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<tr>
<td>CT head with IV contrast</td>
<td>2</td>
<td></td>
<td>O</td>
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<tr>
<td>MRI head without and with IV contrast</td>
<td>2</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>Arteriography cerebral</td>
<td>2</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>US head</td>
<td>1</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>FDG-PET/CT head</td>
<td>1</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>Tc-99m HMPAO SPECT head</td>
<td>1</td>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

*Relative Radiation Level
Findings: (unlabeled)
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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.
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.
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


https://acsearch.acr.org/docs/3083021/Narrative/