A Case Report of Wrestling-Induced Osteomyelitis of the Sternum

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Chief Complaint

A 15 year old high school wrestler presents with a chief complaint of sharp sternal chest pain

History

Days 1 – 2
- Day 1
  - Patient was at wrestling practice when he noticed gradually worsening sternal chest pain after 5-6 take-down drills.
  - Sternal chest pain continued throughout practice and gradually worsened overnight.
- Day 2
  - His parents took him to see their chiropractor which resulted in significant worsening of his pain.

Days 3 – 4
- Over the next 2 days pain continued to worsen and was waking him from sleep.
- He developed fever
History

Day 4
- He was taken to orthopedic urgent care clinic and evaluated with plain films and an MRI
  - Both were read as normal
- He was sent to his PCP to be worked up for pneumonia
  - exam not consistent with pneumonia
  - His labs were normal at that time

Day 5
- Emergency Department
  - Labs – Normal
    - Troponin T – <0.011
  - EKG – Normal
    - NSR, HR 82, RVR in V1 (normal in athlete)
    - No other acute ST/T wave changes noted, or evidence of ischemia.
  - CXR repeated – normal
  - CT – read as normal

2 view chest

FINDINGS:
- Visualized sternum appears grossly intact.
- No acute cardiopulmonary process identified.

CT Chest with Contrast

FINDINGS:
- Regarding the osseous structures, there are all grossly intact and age-appropriate. Specifically the sternum shows no displaced fracture or cortical disruption. Developing ossification centers of the sternum all appear intact and age-appropriate.

IMPRESSION:
- Normal findings.
- Specifically there is no evidence of displaced or deforming sternal, rib or vertebral body fracture.
- No acute cardiopulmonary process.
History

- **Days 6 – 8**
  - Pain and fever continued
    - Fevers reaching 104.5°F
  - Developed
    - Myalgias
    - Dizziness
    - Anorexia
    - Intermittent nausea and vomiting
      - Possibly secondary to Tylenol #3

- **Day 7**
  - Blood cultures ordered by PCP
    - Gram positive cocci in clusters

- **Day 8**
  - Sent to the emergency department at a local children's hospital
  - Admitted to hospital with pediatric infectious disease consult

**Physical Exam**

- **Vitals:**
  - Temperature: 38°C
  - Blood pressure: 114/54
  - Pulse: 78
  - SPO₂: 96%
  - Respiratory rate: 20

- **Cardiovascular:** Normal rate, regular rhythm and normal heart sounds.

- **Pulmonary:** poor effort secondary to pain. He has no wheezes, rhonchi, or rales.

- **Chest wall:** He exhibits tenderness of the sternum and surrounding tissues. No mass, laceration, crepitus, edema, deformity, swelling, or retractions noted.
Differential Diagnosis

- Sternal osteomyelitis
- Endocarditis
- Infected retrosternal hematoma
- Pericarditis/myocarditis
- Infected pericardial effusion
- Malignancy

Tests and Results

- Labs:
  - WBC - 5.79
  - Bands - 17%
  - Sed rate - 20
  - CRP - 88.4
- ECHO: Structurally normal with no evidence of vegetation

Tests and Results

- MRI with and without contrast
  - Findings: Minimal T2 and post gadolinium hyperintensity in the first and second sternal segments with surrounding edema, including the retrosternal space and pericardiosternal junctions. No soft tissue abnormality. No pericardial effusion. Small right pleural effusion. Streaky lower lobe disease may represent pneumonia or atelectasis. The upper abdomen is unremarkable.
  - IMPRESSION: Probable sternal osteomyelitis.

Final/Working Diagnosis

- Primary sternal osteomyelitis complicated by staphylococcus aureus bacteremia.
Treatment

- IV Vancomycin until sensitivities were available
- IV Ancef (cefazolin) for 2 weeks followed by oral Keflex (cephalexin) for 4 weeks.
- Surgical intervention was not found to be necessary.

Outcome & Follow-up

- Follow-up done by pediatric infectious disease after 4 weeks of oral Keflex.
  - He was feeling much better and denied any pain or difficulty breathing
  - Appetite had improved and inflammatory markers had returned to normal
  - He was discharged from the pediatric infectious disease practice

Return to activity

- He had gradually returned to sports under supervision of orthopedics after removal of PICC line
- When he exercises he feels out of shape but has no marked fatigue

PRIMARY STERNAL OSTEOMYELITIS

- Rare condition
- In the US it is usually caused by Staph aureus
- Second most common pathogen is pseudomonas aeruginosa
  - Intravenous heroin users
- May or may not follow blunt trauma to the chest
PRIMARY STERNAL OSTEOMYELITIS

- Rare causes
  - Aspergillus
  - Nocardia
  - Actinomyces israelii
- Sternal osteomyelitis secondary to Tuberculosis is a cause in endemic areas.

PRIMARY STERNAL OSTEOMYELITIS TREATMENT

- Incision and drainage with surgical debridement
  - Efforts taken to keep posterior periosteum intact
- Mild cases can be treated with appropriate antibiotic therapy alone
  - Less aggressive than secondary osteomyelitis
- Hyperbaric oxygen therapy
  - May speed recovery and decrease need for reconstructive therapy.

Secondary Sternal Osteomyelitis

- Causes:
  - Complication of open heart surgery
  - Penetrating trauma
  - Whatever this is

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[Link to skull appreciation society website for sternal skull implant]
References