A Rare Cause of Chest Pain in a Healthy Teen

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Disclosure of Financial Relationships

• No financial disclosures
History of Present Illness

• 17 y/o healthy M presented to OSH ER with 2 days of subjective fevers, difficulty breathing and severe, sharp substernal chest pain
• Gradually worsening
• Constant
• Achy, non-pleuritic
• Radiating to mid chest
• Unchanged with position
• No history of trauma
• No aggravating/relieving factors
• Associated symptoms: diaphoresis, shortness of breath, sore throat, odynophagia, denies nausea/vomiting

Other relevant past history

• Recent strep throat infection
• Other PMH/PSH/FH/SH non-contributory
• Denies smoking, alcohol use or recreational drug use
Additional questions

- No family history of premature sudden cardiac death
- No prior episodes of chest pain
- No history of heart murmur
- No history of episodes of syncope

Physical examination

- ER vital signs:
  - T: 98.5°F (Oral)
  - HR: 106 bpm
  - RR: 18 breaths/min
  - BP: 116/77
  - SpO2: 97%
  - HT: 185 cm (91%)
  - WT: 73.5 kg (75%)

  Physical Exam
  GEN: Alert, No acute distress
  HEENT: PERRL. TM clear. Posterior pharynx benign without lesions.
  LUNGS: Clear bilaterally. No pleuritic pain.
  HEART: Tachycardia. No murmurs. Capillary refill 2-3 seconds
  CHEST WALL: No tenderness with palpation
  MSK: Normal ROM, no swelling or deformities in any extremities
  GI: Soft, NTND. No rebound or guarding. Negative Murphy’s sign.
Initial Differential Diagnosis

What would you be worried about for this patient?

Initial Differential Diagnosis

• Life-threatening conditions:
  • Cardiac: Classic and Variant angina, Myocarditis, Pericarditis, Arrhythmia, Aortic dissection, HOCM, DCM
  • Pulmonary: Pneumothorax, Pulmonary hypertension, Pulmonary embolism
  • Gastrointestinal: Esophageal rupture

• Common conditions:
  • Musculoskeletal: costochondritis, muscle strain, or trauma
  • Ingestion: caustic/corrosive agents, cocaine
  • Psychogenic: panic attack, hyperventilation syndrome, or psychosomatic complaints
  • Respiratory: asthma, pneumonia, or pleuritis
  • Gastrointestinal disease: pill esophagitis, pancreatitis, GERD, or gastritis
Initial ER workup

- CBC w diff
- CMP
- UA
- UDS
- Rapid strep
- Cardiac enzymes (Total CK, CK-MB, troponin)
- Coagulation studies (PT, PTT, D-dimer, INR)
- EKG
- Chest X-ray
- CT angiogram

Results

CXR:
No chest radiographic evidence of acute cardiopulmonary disease.

CT angiogram:
FINDINGS: No pleural effusion or pericardial effusion. The heart is not enlarged. No evidence for pulmonary embolus. Lungs appear clear
IMPRESSION: Negative study.

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
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<tbody>
<tr>
<td>Total CK</td>
<td>52 unit/L</td>
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<tr>
<td>CK MB</td>
<td>&lt;0.5 ng/mL</td>
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<tr>
<td>Troponin-I</td>
<td>&lt;0.02 ng/mL</td>
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<tr>
<td>PT</td>
<td>14.7 seconds</td>
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<tr>
<td>INR</td>
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<tr>
<td>PTT</td>
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<td>D-dimer</td>
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<tr>
<td>UDS</td>
<td>negative</td>
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Total CK 52 unit/L
CK MB <0.5 ng/mL
Troponin-I <0.02 ng/mL
PT 14.7 seconds
INR 1.13
PTT 33.8 seconds
D-dimer: positive
UDS negative
Inpatient Admission

• Severe, progressive odynophagia
• Pain located in epigastric region
• Dehydrated due to decreased fluid intake
• Failed PO challenge at ER, transferred to our inpatient facility for higher level of care, pain control, and subspecialty consultation.

Inpatient Physical Exam

• Admission vitals:
  • T: 99.2 °F (Oral) HR: 79 (Peripheral) RR: 10 BP: 137/70 SpO2: 99%

• Admission exam:
  GEN: Alert, No acute distress
  LUNGS: Clear bilaterally. No pleuritic pain.
  HEART: Regular rate and rhythm, no murmurs. Capillary refill ~3 seconds
  CHEST WALL: No tenderness with palpation
  MSK: Normal ROM, no swelling or deformities in any extremities
  GI: Soft, NTND. No rebound or guarding. Negative Murphy’s sign.
Diagnostic Pause

• How would order of DDx change with new information?

• Are there new items you would like to add to DDx?

Hospital Course

• Failed PO challenge with exacerbation of pain on oral intake

• Started on IV fluids, IV pantoprazole with sucralfate and morphine for pain management

• Pediatric GI consulted
Additional Inpatient Work-Up

- Lipase level obtained which was normal
- UGI series obtained which was normal
- In next 24 hours, worsening of pain, unable to swallow even secretions
- Emergent EGD obtained

Esophagogastroduodenoscopy images showing severe pan-esophagitis.
Pathology report

Duodenum – No significant histopathologic alterations.

Stomach – Mild chronic inflammation. Negative for H. pylori

Esophagus – Acute necrotizing pan-esophagitis. Positive for HSV on IHC stain

Final hospital course

• Started on IV acyclovir

• HSV + immunohistochemical stain

• Immunodeficiency evaluation:
  • HIV negative
  • Normal growth parameters
  • No history of serious bacterial infections

• New girlfriend with recent history of cold sores
HSV Esophagitis

- Extensively described in immunocompromised hosts
  - Can be devastating and fatal in this population (1, 2).

- Only handful of case reports in healthy patients (1-10).

- A review looked at 38 healthy patients, both adult and pediatric with HSV esophagitis (1)
  - 3:1 male predominance overall (increased to 90% in the pediatrics)
  - Typical patient was young, healthy, male (less than 18 years old in ¼ of cases) presenting with:
    - acute odynophagia/dysphagia
    - chest pain
    - Heartburn
    - +/- Prodromal symptoms or oral lesions.

What about chest pain?

Fig. 1. Emergency department discharge diagnosis from the largest study in pediatric chest pain. (NOS, not otherwise specified). (From Hambook JT, Kimball TR, Khoury P, et al. Disparities exist in the emergency department evaluation of pediatric chest pain. Congenit Heart Dis 2010;5:285–91;
Remainder of clinical course

- Rapid improvement in clinical status with resolution of chest pain and dysphagia on initiation of acyclovir therapy
- Able to tolerate adequate PO intake on discharge
- Discharged to complete 7-day course of PO valacyclovir
- Scheduled to follow up in GI clinic in 2 weeks, but by that time, symptoms had resolved and family canceled the follow up visit.

Take Home Points

- Cardiac etiology least common cause of chest pain in pediatrics (4-6%) (11)
- Patients with esophagitis frequently present with retrosternal “chest pain” (1, 7, 9).
- Diagnosis achieved by characteristic appearance on EGD, biopsy specimens, positive HSV IHC stain
- Esophagitis should be considered for all patients presenting with the triad of chest pain, odynophagia, and fever, as early recognition can prevent broad cardiopulmonary workups (10).
References