Not Your Typical Sinus Infection

ACP CLINICAL VIGNETTE PRESENTATIONS
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Learning Objectives

- Highlight an interesting case of a complicated sinus infection
- Discuss the disease process of the diagnosis in this case
- Discuss signs and symptoms that can aid with prompt recognition of this disease and review available treatment options
Case Presentation

- **CC:** Headache and difficulty breathing
- **HPI:** 26 year old Caucasian male who presents with complaint of worsening headache x 8 days and sudden onset shortness of breath starting evening prior to admission
### Case Presentation

<table>
<thead>
<tr>
<th>Pertinent Positives</th>
<th>Pertinent Negatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• HA initially around eyes → jaw and neck</td>
<td>• No fevers, chills, weight loss, CP, hemoptysis, productive cough</td>
</tr>
<tr>
<td>• Trismus</td>
<td>• No known immunodeficiency</td>
</tr>
<tr>
<td>• Neck tender to palpation/movement</td>
<td>• No recent travel</td>
</tr>
<tr>
<td>• Mild dysphagia and odynophagia</td>
<td>• No h/o DVT or PE</td>
</tr>
<tr>
<td>• Emesis x1 day, non-bloody or bilious</td>
<td></td>
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<tr>
<td>• Underwent dental work for cavity 2 weeks PTA</td>
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</tbody>
</table>
Case Presentation

- **Prior Workup**
  - Seen by PCP 5 days prior for c/o headache and treated for migraine
  - Due to persistent headache CTOH obtained which revealed extensive sinusitis R>L
  - Treated with acetaminophen/butalbital/caffeine, valproic acid, and fluticasone nasal spray
<table>
<thead>
<tr>
<th>Past Medical History</th>
<th>Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• HTN</td>
<td>• Amlodipine</td>
</tr>
<tr>
<td>• GERD</td>
<td>• Citalopram</td>
</tr>
<tr>
<td>• Depression</td>
<td>• Omeprazole</td>
</tr>
<tr>
<td>• Anxiety</td>
<td>• Alprazolam</td>
</tr>
<tr>
<td>• Perthes Disease s/p surgical repair R hip</td>
<td>• Acetaminophen/hydrocodone</td>
</tr>
<tr>
<td>• Migraines</td>
<td>• Naproxen</td>
</tr>
<tr>
<td></td>
<td>• Sumatriptan</td>
</tr>
<tr>
<td></td>
<td>• Acetaminophen/butalbital/caffeine</td>
</tr>
<tr>
<td></td>
<td>• Valproic acid</td>
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</tbody>
</table>
## Case Presentation

<table>
<thead>
<tr>
<th>Social History</th>
<th>Family History</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Smokes 1 ppd x 8 yrs</td>
<td>- Father- HTN and BPH</td>
</tr>
<tr>
<td>- Occasional alcohol use</td>
<td>- Mother- migraines</td>
</tr>
<tr>
<td>- Occasional marijuana use</td>
<td></td>
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<tr>
<td>- No IV drug use</td>
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</tbody>
</table>
Physical Exam

- Vitals: T 101.1, BP 157/81, HR 138, RR 42, SpO2 80% on RA

- Gen: alert, + resp distress
- HEENT: EOMI, PERRL, mild R periorbital edema, unable to visualize oropharynx
- Neck: + anterior cervical LAD, neck tender to mild palpation especially anteriorly
- CV: tachycardic, RR, nml S1/S2, no m/r/g's
- Resp: + tachypnea, slightly diminished in R base and L mid lung field, no wheezes
- Abd/Ext/Skin: WNLs
- Neuro: A&Ox3, no focal deficits, negative Kernig, unable to perform Brudzinski 2/2 neck pain
## Initial Labs/Diagnostics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>11.1</td>
<td>12% bands</td>
</tr>
<tr>
<td>22.6</td>
<td>81% segs</td>
</tr>
<tr>
<td>34.1</td>
<td>5% lymph</td>
</tr>
<tr>
<td></td>
<td>2% mono</td>
</tr>
<tr>
<td>140</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>13</td>
</tr>
<tr>
<td>2.6</td>
<td>23.9</td>
</tr>
<tr>
<td></td>
<td>0.74</td>
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</tbody>
</table>

**DIC panel** - INR 1.9, PT 22.0, APTT 30, D-dimer 4901, plt 33, fibrin 601

**Peripheral smear** - target cells, toxic granulation, enlarged platelets

**ECG** - sinus tach, no ischemic changes

**Contrast CT chest** - No PE. Scattered BL pulmonary infiltrates concerning for atypical substantial infection/inflammatory process

**ABG** - pH 7.50, PCO2 34, HCO3 25.9, PO2 63, O2S 90% on 15L face mask

**UDS** - + barbiturates, cannabinoids, opiates
Investigations

- Extensive infectious workup revealed pan-sensitive *Streptococcus intermedius* bacteremia on admit blood cultures
- Development of worsening right sided periorbital edema, chemosis, ptosis, proptosis, and multiple cranial nerve palsies
- CTOH, face and neck obtained
CT Scan

Occluded L IJ
CT Scan

Septic Emboli
CT Scan

Cavernous sinus thrombosis

Superior ophthalmic vein thrombus
Diagnosis

CAVERNOUS SINUS THROMBOPHLEBITIS
Discussion

- Primary infections of head and neck causing septic thrombophlebitis rarely occurs
- Lemierre syndrome
  - First described by French microbiologist Andre Lemierre in 1936
  - Infection of oropharynx → septic thrombophlebitis of internal jugular vein and evidence of septic metastasis
  - *Fusobacterium necrophorum*
- Similar disease process can be initiated by a sinus or dental focus of infection and involve other pathogens
  - Potential to spread to nearby intracranial structures such as cavernous sinus
Discussion

- Cavernous sinus thrombophlebitis
  - Pre-antibiotic era
    - Uniformly fatal disease
  - Post-antibiotic era
    - Mortality rates as high as 30%
  - Sphenoid sinusitis most common cause
Discussion

- Pathophysiology
  - Direct extension, hematogenous, and lymphatic spread
  - Absence of valves in dural sinuses
- Clinical manifestations can be predicted from the anatomy
Discussion

- **Clues For Clinical Diagnosis**
  - HA
  - Fever
  - Orbital edema
  - Proptosis
  - Chemosis
  - Associated CN III, IV, or VI palsy

- **Isolated pathogens**
  - *S. aureus*, *S. pneumoniae*, other aerobic and anaerobic streptococci, gram negative bacilli, other anaerobic bacteria, and rarely fungi such as *Aspergillus fumigatus* and mucormycosis
  - Few case reports identify *S. intermedius* as pathogen
Treatment Options

- Medical
  - Antimicrobial therapy
    - Broad spectrum antibiotics
    - Generally 3-6 weeks
  - Anticoagulation
    - Use is debated
    - No conclusive evidence for reduced mortality

- Surgical
  - Recommended if aggressive medical therapy fails
  - Evidence of persistent septic embolization or extending thrombus
Follow Up

• Intubated for respiratory support shortly after admission for one week
• Treated with broad spectrum antibiotics
• After discovery of cavernous sinus thrombophlebitis anticoagulation with LMWH and corticosteroid therapy initiated with rapid improvement in ocular manifestations
• Pt declined surgical debridement of sinuses
• MRI brain and orbits prior to discharge revealed almost complete resolution of right cavernous sinus thrombophlebitis
Thank you