

Secondary Bacterial Pneumonia After Influenza Infection in Patient with DiGeorge Syndrome

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Extraordinary People. Extraordinary Care.

Background

Objective:

This is the case of an 18-year-old female with DiGeorge syndrome presenting with a 6-day history of malaise, vomiting and diarrhea. She then developed rhinorrhea, productive cough, and expiratory rhonchi. After obtaining nasal swab and imaging, she was found to have influenza A with secondary bacterial pneumonia. Despite her immunocompromised state, she was successfully treated as an outpatient. Being able to treat severe illnesses as an outpatient will not only prevent delays in care but also decrease hospitalization.

Introduction:

DiGeorge Syndrome is considered a prototypic cell-mediated immunodeficiency due to microdeletions at chromosome 22q11.2. This deletion leads to abnormal development of the third pharyngeal pouch which results in agenesis or hypoplasia of the parathyroid glands and the thymus. In 75% of patients, the immune system is affected to some degree. Patients with DiGeorge Syndrome are at greater risk for infection, malignancy, and cardiac events due to anatomic and immunologic complications. This leaves them susceptible to opportunistic infections which often lead to poor outcomes. As an increased number of patients with DiGeorge Syndrome are surviving into adulthood, it is important to understand the long-term implications.

Case Report

Chief Complaint: Flu-like symptoms

History of Presenting Illness: 18-year-old female presents with 6-day history of bilious vomitus and non-bloody diarrhea. She endorses a 7/10, diffuse abdominal pain that feels more like pressure. The pain is localized only to her abdomen. She can tolerate liquids, but solid food worsens her pain. She then developed a productive cough with thick, green sputum. Her cough is present all day, but worse in the mornings. She has never had symptoms like this before. She tried using her albuterol inhaler, but her symptoms persisted. She also tried NyQuil and Alka-Seltzer with little relief.

ROS: Positive for fatigue, abdominal pain, nausea, vomiting, diarrhea, cough, dyspnea, and wheezing

PMHx: DiGeorge syndrome, Tetralogy of Fallot, thoracic levoscoliosis, and asthma

PSH: Repaired Tetralogy of Fallot and scoliosis repair

Allergies: Pollen and Transparent dressings (rash)

Medications: Albuterol inhaler, Mometasone/formoterol inhaler, Zyrtec, and Flonase

Social: Never smoker. Denies alcohol or illicit drug use

Physical Exam:

General: Ill-appearing. Appears stated age

HEENT: Nares patent, **nasal mucosa is edematous**, no cervical adenopathy, trachea midline, Oropharynx non-erythematous, tympanic membrane clear

Lungs: **Decreased breath sounds at left upper lung field**. Scattered Expiratory wheeze heard throughout both lung fields. **Dull percussion in the left upper lung field**.

Symmetry: Symmetric expansion. No increased work of breathing.

Heart: RRR, no murmurs/gallops/rubs

Peripheral: Capillary refill < 2 secs. +2 Upper and lower extremity pulses.

GI: Soft, non-distended, **mild tenderness in epigastrium**, no rebound or guarding.

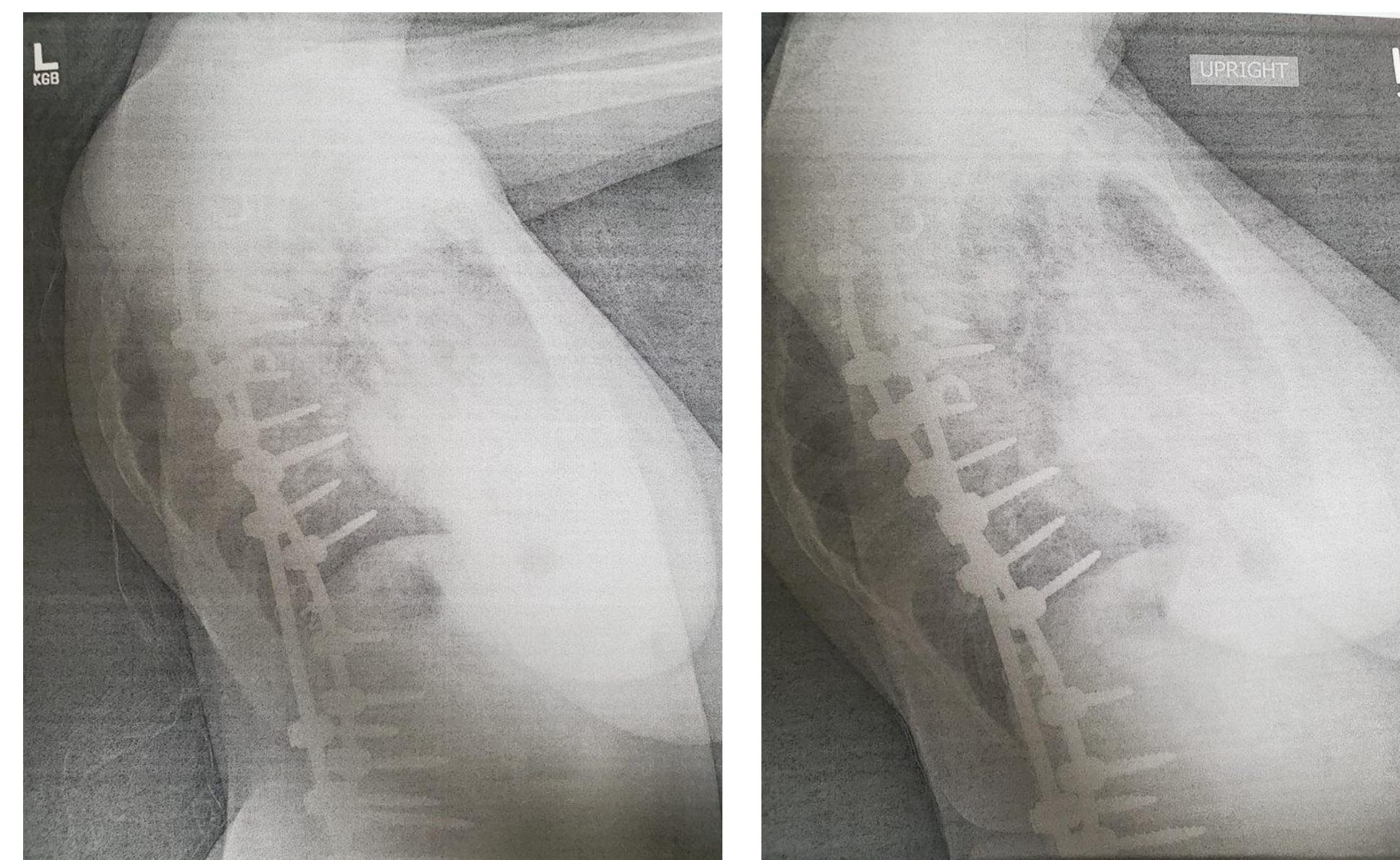
Normal bowel sounds

Vitals

- Temp: 98.9F
- BP 110/65
- Pulse 96
- RR 18
- SPO₂ 95% RA
- Weight 126 lbs.

Labs/Imaging

- Influenza A – Detected
- Influenza B – Not Detected
- SARS-CoV-2 NAA – not detected



-Right image: Baseline CXR of patient from 2019

-Left image: Space occupying consolidation toward the apex of the left lung as well as obscuring of costophrenic border.

Treatment

Differential Diagnoses:

- Gastritis
- GERD
- Viral URI
- COVID-19
- Pneumonia
- Bronchitis
- Sinusitis
- Asthma
- Allergic rhinitis
- Metastatic disease

She was found to have influenza with secondary bacterial pneumonia. The following treatment plan was implemented:

1. Azithromycin 250 mg tablet: 500 mg day 1, then 250 mg for 4 days

- Started over Augmentin since it covered the most notable pathogens associated with secondary bacterial pneumonia and atypical pneumonia.

2. Oseltamivir 75 mg BID for 5 days

- Despite her symptoms lasting more than 72 hours, she was still prescribed given her comorbid conditions.

Discussion

Influenza is a major cause of epidemics and pandemics due to antigenic drift. Moreover, bacterial co/secondary infections further increase morbidity and mortality of influenza infections especially for at-risk patients. Worldwide, annual epidemics reportedly cause up to five million cases of severe illness resulting in 250,000–500,000 deaths per year.

What makes this case unique is that we were able to successfully treat this patient as an outpatient. Other similar case reports involved patients who were hospitalized; there were no other cases about treating at-risk patients in an outpatient setting. We considered her vital signs, respiratory effort, hydration status, and disease burden when calculating this patient's risk. We did consider that the NyQuil could have masked a fever; however, the rest of vitals and PE were reassuring. This suggests that other risk stratification tools, like Curb-65 and PSI, could still be useful in decision making for at-risk patients. One consideration could be to obtain sputum cultures for speciation to better tailor treatment. Unfortunately, viral outbreaks are not uncommon which means the threat of severe disease is always looming. Quickly assessing risk for these patients would not only expedite care, but also reduce morbidity and mortality.

Another concern is prolonged hospital courses. Hospitalizations can lead to resistant pathogens, increased anxiety, and financial burdens. The medical cost of influenza infections has been estimated to be \$3.2 billion. Overall direct healthcare cost, such as hospitalization or ED visit, was 2.1 to 2.7 times higher in complicated cases compared to uncomplicated cases. Being able to reduce hospitalizations is where primary care physicians can make a significant impact. Finding ways to treat vulnerable populations could significantly reduce the financial burden on patients and the healthcare system.

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