What Is the Cause of This Swelling and Why Am I Short of Breath When I Exercise?: Problem Handouts

What Is the Cause of This Swelling and Why Am I Short of Breath When I Exercise?

Part 1

Joan is a corporate lawyer for a Fortune-500 company downtown Chicago. She has been physically active her entire life, playing field hockey for her private high school in the western suburbs, intercollegiate field hockey for an Ivy League University, culminating in playing on a NCAA Division III championship team and earning All-American Status her senior year in college. Joan has remained active in her professional life, running an average of thirty five miles per week. She also plays tennis at her local tennis club, and is ranked as the top female tennis player in the club, and one of the top ten players overall within the club.

After graduation from college, Joan attended law school at yet another Ivy League university, followed by an MBA from the Kellogg School of Business at Northwestern University in Chicago. Her firm in Chicago has employed her for ten years, rising to chief legal counsel at the company.

For the past month, Joan has become increasingly short of breath upon exertion, to the point where she is no longer able to play tennis or run. In addition, she has noted some minor swelling in her lower extremities and right upper extremity. She decided to see her family physician several months before her regularly scheduled annual physical.

Patient History:

- Previously healthy 38-year old, single, female.
- Persistent nausea with vague abdominal discomfort five to six weeks ago, resulting in an elective surgery with laparoscopic adhesiolysis four weeks earlier.
- Dyspnea on exertion for last three to four weeks.
- Lightheadedness associated with coughing paroxysms.
- Denies chest pain, palpitations, wheezing, productive cough, hemoptysis, or heartburn.
- Smoked approximately one-half pack of cigarettes daily for approximately sixteen years, drinks one glass of red wine with dinner each night, no history of illicit drug use, prescription medications, over the counter medicines or herbal remedies.
- No fever, swollen lymph nodes, night sweats or change in weight.
- Mild bilateral lower extremity swelling, discomfort, and swelling of her right upper extremity in for the two weeks.
- Patient denied neurologic symptoms such as diplopia, dysarthria, numbness, or tingling.

Physical Examination:

- 5'10" and 135 pounds.
- Blood pressure, temperature, pulse oximetry, cardiac rate, and rhythm were all normal range at rest.

- Breath sounds clear bilaterally, no evidence of an end expiratory wheeze, mild crackles at the bases bilaterally with dullness to percussion.
- Normoactive precordium, slightly distant heart tones, no jugular venous distention, but a venous cord was palpable along the anterior surface of her neck extending along the superior border of the clavicle.
- 2+ pulses in both upper and lower extremities.
- Mild 1+ edema of the lower extremities.
- Mild 1+ edema of the right upper extremity, slightly dusky in appearance.
- Cranial nerves intact, no gross motor, sensory, or cognitive deficits.

Question:

Utilizing sound anatomical logic, what is your diagnosis for this patient?

What Is the Cause of This Swelling and Why Am I Short of Breath When I Exercise?

Part 2

Joan's physician is perplexed. He recommends admission to Northwestern Memorial Hospital. Upon admission, a team of physicians evaluate Joan, including a pulmonologist and cardiologist. All of the findings of the preliminary examination by her family physician are confirmed. Additional findings are given below:

Physical Examination and Laboratory Results:

- A grade 2/6 systolic murmur was heard in the right upper sternal area and a "flop" was appreciated during systole.
- Right upper extremity was slightly discolored. Pain to palpation and light touch along the medial aspect of the right hand to her right axilla.
- Patient's deep tendon reflexes were normal in the left upper limb and in both lower limbs, but were slightly depressed in the right upper limb due to marked swelling.
- Hemoglobin 11.0 g/dL, total WBC 15,600/mm3, and platelet count 49,000/mm^3.
- Prothrombin time was prolonged 15.4 seconds, partial thromboplastin time was increased to 24 seconds (International Normalized Ratio, 1.6, and fibrinogen level was decreased to 186 mg/dL.
- Plain film chest radiograph showed poor inspiratory effort, atelectasis at both bases as well as bilateral pleural effusions. Cardiac silhouette was at the upper limit of normal, no significant lymphadenopathy or mediastinal nodes were noted.
- High Resolution CT with contrast revealed bilateral atelectasis and pleural effusions at the lung bases, small pericardial effusion but no evidence of pulmonary emboli. Lung windows were normal.

Utilizing sound anatomical logic answer the following questions:

1. What is your diagnosis for this patient?
2. What is the cause for the patient's shortness of breath?
3. Would an echocardiogram be indicated for this patient and what information would be gained?
4. This patient experienced right upper extremity swelling. Give a solid anatomical explanation for this finding in the patient's examination. In addition, give a thorough anatomical description of the vessels involved.