PATIENT CASE

**Patient’s Chief Complaints**

“I have severe chest pain and I can’t seem to catch my breath. I think that I may be having a heart attack.”

**History of Present Illness**

Mrs. V.A. is a 30-year-old woman who presents to the hospital emergency room following 90 minutes of chest pain. She describes the severity of her pain as 8 on a scale of 10. An hour-and-a-half ago, she developed sharp and constant right-sided chest pain and right-sided mid-back pain. The pain became worse when she attempted to lie down or take a deep breath and improved a little when she sat down. She also has had difficulty breathing. She denies any fever, chills, or coughing up blood. She reports that she just returned home 36 hours ago following a 13-hour flight from Tokyo.

**Patient Case Question 1.** What clinical manifestations, if any, suggest a pulmonary embolus in this patient?

**Past Medical History**

- Migraines with aura since age 23
- Mild endometriosis × 5 years
- Positive for Protein S deficiency
- One episode of deep vein thrombosis 2 years ago; treated with warfarin for 1 year
- Acute sinusitis 1 year ago

**Past Surgical History**

- Orthopedic surgery for leg trauma at age 7
- Ovarian cyst removed 10 months ago

For the Disease Summary for this case study, see the CD-ROM.
**Family History**

- Father has hypertension
- Mother died from metastatic cervical cancer at age 49
- Brother is alive and well
- No family history of venous thromboembolic disease

**Social History**

- Patient lives with her husband and 8-year-old daughter
- Monogamous relationship with her husband of 10 years; sexually active
- 12 pack-year smoking history; currently smokes 1 pack per day
- Business executive with active travel schedule
- Negative for alcohol use or intravenous drug abuse
- Occasional caffeine intake

**Medications**

- 30 μg ethinyl estradiol with 0.3 mg norgestrel × 4 years
- Amitriptyline 50 mg po Q HS
- Cafergot 2 tablets po at onset of migraine, then 1 tablet po every 30 minutes PRN
- Metoclopramide 10 mg po PRN
- Ibuprofen 200 mg po PRN for cramps
- Multiple vitamin 1 tablet po QD
- Denies taking any herbal products

**Patient Case Question 2.** Identify five major risk factors of this patient for pulmonary thromboembolism.

**Patient Case Question 3.** Why do you think this patient is taking amitriptyline at bedtime every evening?

**Patient Case Question 4.** Why is this patient taking metoclopramide as needed?

**Patient Case Question 5.** What condition is causing cramps in this patient for which she requires ibuprofen?

**Review of Systems**

- (−) cough or hemoptysis
- (−) headache or blurred vision
- (−) auditory complaints
- (−) lightheadedness
- (−) extremity or neurologic complaints
- All other systems are negative

**Allergies**

- Demerol (“makes me goofy”)
- Sulfa-containing products (widespread measles-like, pruritic rash)
Physical Examination and Laboratory Tests

General
The patient is a well-developed white woman who appears slightly anxious, but otherwise is in no apparent distress.

Vital Signs
See Patient Case Table 9.1

<table>
<thead>
<tr>
<th>Patient Case Table 9.1 Vital Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BP</strong></td>
</tr>
<tr>
<td>126/75</td>
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<tr>
<td>P 105, regular</td>
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Patient Case Question 6. Are any of the patient’s vital signs consistent with pulmonary thromboembolism?

Patient Case Question 7. Is this patient technically considered underweight, overweight, or obese or is this patient’s weight considered normal and healthy?

Skin
* Fair complexion
* Normal turgor
* No obvious lesions

Head, Eyes, Ears, Nose, and Throat
* Pupils equal, round, and reactive to light and accommodation
* Extra-ocular muscles intact
* Fundi are benign
* Tympanic membranes clear throughout with no drainage
* Nose and throat clear
* Mucous membranes pink and moist

Neck
* Supple with no obvious nodes or carotid bruits
* Normal thyroid
* Negative for jugular vein distension

Patient Case Question 8. If the clinician had observed significant jugular vein distension, what is a reasonable explanation?

Cardiovascular
* Rapid but regular rate
* No murmurs, gallops, or rubs

Chest/Lungs
* No tenderness
* Subnormal diaphragmatic excursion
* No wheezing or crackles
Abdomen
• Soft with positive bowel sounds
• Non-tender and non-distended
• No hepatomegaly or splenomegaly

Breasts
Normal with no lumps

Genit/Rect
• No masses or discharge
• Normal anal sphincter tone
• Heme-negative stool

Musculoskeletal/Extremities
• Prominent saphenous vein visible in left leg with multiple varicosities bilaterally
• Peripheral pulses 1+ bilaterally
• No cyanosis, clubbing, or edema
• Strength 5/5 throughout
• Both feet cool to touch

Neurological
• Alert and oriented to self, time, and place
• Cranial nerves II–XII intact
• Deep tendon patellar reflexes 2+

Laboratory Blood Test Results
See Patient Case Table 9.2

| Patient Case Table 9.2 Laboratory Blood Test Results |
|----------------|----------------|----------------|----------------|
| Na 141 meq/L | HCO<sub>3</sub> 27 meq/L | Hb 11.9 g/dL | WBC 5,300/mm<sup>3</sup> |
| K 4.3 meq/L | BUN 17 mg/dL | Hct 34.8% | PTT 25.0 sec |
| Cl 110 meq/L | Cr 1.1 mg/dL | Plt 306,000/mm<sup>3</sup> | PT 14.0 sec |

Patient Case Question 9. Are any of the patient’s laboratory blood tests significantly abnormal? Provide a reasonable explanation for each abnormal test.

Patient Case Question 10. What might the patient’s chest x-ray reveal?

Electrocardiography
Sinus tachycardia

Echocardiography
Ventricular wall movements within normal limits

Lower Extremity Venous Duplex Ultrasonography
Both right and left lower extremities show abnormalities of venous narrowing, prominent collateral vessels, and incompressibility of the deep venous system in the popliteal veins. These findings are consistent with bilateral DVT.
**PART 1 • CARDIOVASCULAR DISORDERS**

### V/Q Scan

Perfusion defect at right base. Some mismatch between perfusion abnormality and ventilation of right lung, suggesting an intermediate probability for pulmonary embolus.

### Pulmonary Angiogram

Abrupt arterial cutoff in peripheral vessel in right base

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**Patient Case Question 11.** Which single clinical finding provides the strongest evidence for pulmonary embolus in this patient?

**Patient Case Question 12.** Which is a more appropriate duration of treatment with warfarin in this patient: 3 months, 6 months, or long-term anticoagulation?

**Patient Case Question 13.** Is the use of a thrombolytic agent in this patient advisable?

**Patient Case Question 14.** Would you suspect that this patient’s plasma D-dimer concentration is negative or elevated? Why?

**Patient Case Question 15.** Is massive pulmonary thromboembolism an appropriate diagnosis of this patient?

**Patient Case Question 16.** What is a likely cause of respiratory alkalosis in this patient?

**Patient Case Question 17.** Areas of ischemia in the lung from a pulmonary embolus usually become hemorrhagic. The patient whose chest x-ray is shown in Patient Case Figure 9.1 presented with chest pain, hypoxia, and lower limb deep vein thrombosis. Where is the hemorrhagic area—upper right lung, lower right lung, upper left lung, or lower left lung?

**Patient Case Question 18.** In terms of thrombus development, what is the fundamental difference between heparin and alteplase?

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**Patient Case Figure 9.1**