Kaplan USMLE Step 2 prep: Woman with metastatic cancer, severe leg pain

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If you’re preparing for the United States Medical Licensing Examination® (USMLE®) Step 2 exam, you might want to know which questions are most often missed by test-prep takers. Check out this example from Kaplan Medical, and read an expert explanation of the answer. Also check out all posts in this series.

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This month’s stumper

A 65-year-old woman with metastatic cancer is admitted to the hospital because of severe pain in her left leg for two weeks. The pain is in the left thigh near the hip. She has been having trouble walking because of the pain. The pain is worse at night. She has had no fever, morning stiffness, or trauma. Serum alkaline phosphatase level is 400 U/L. Plain x-ray shows a lytic lesion in the proximal femur.

This patient most likely has a malignancy of which of the following?

A. Breast.
B. Colon.
C. Melanocytes.
D. Pancreas.
E. Thyroid.
The correct answer is A.

Kaplan Medical explains why

This patient has a bone metastasis. Patients who have bone metastases most commonly present complaining of bone pain that is classically worse at night. They may also have pathologic fractures and laboratory abnormalities, including hyper/hypocalcemia and elevated alkaline phosphatase levels.

The axial skeleton (skull, vertebrae, ribs, and pelvis) and the proximal portions of the humerus and femur are most commonly affected (red marrow sites in adults). Bone metastases are more common than primary tumors of bone. Tumors that are known to metastasize to bone include carcinomas of the prostate, breast, lung, kidney, bladder, and thyroid.

Of these, carcinomas of the breast, prostate, and lungs comprise the overwhelming majority. This is likely because, with the exception of non-melanoma skin cancers, these are the three most common
carcinomas in the population. Whereas prostate cancer is typically osteoblastic in nature, breast and lung metastasis are osteolytic.

**Why the other answers are wrong**

**Choices B and D:** Carcinomas of the colon and pancreas most commonly metastasize to the regional lymph nodes of the gut and then to the liver. Severely advanced disease may show metastases to the lungs.

**Choice C:** Melanoma, a malignancy of the melanocytes is a tumor that commonly metastasizes, most frequently to skin, subcutaneous soft tissues, lung, and brain. Although metastasis to the bone is possible, it is less likely.

**Choice E:** Any form of thyroid carcinoma has the capability to metastasize to bone, where such metastases typically produce osteolytic lesions. Of the forms of thyroid carcinoma, papillary carcinoma is the least aggressive, and anaplastic is the most aggressive. Thyroid carcinomas as a whole are considerably less common than lung, breast, and prostate cancer and are therefore not the most likely tumor in this case.

**Tips to remember**

- Bone metastases are more common than primary tumors of bone.
- Carcinomas of the breast, prostate, and lung are the most common tumors that metastasize to bone.
- Gastrointestinal malignancies typically metastasize to the liver and lungs rather than to bone.

For more prep questions on USMLE Steps 1, 2 and 3, view other posts in this series.