What are the most common bony sites for metastatic carcinoma?

Depending on where the cancer originates from (most commonly the breast, prostate, and lung), the thoracic spine, pelvis, long bones, and ribs are the most common sites affected by metastatic carcinomas.

What is your process for diagnosing patients with metastatic carcinoma?

I take a complete patient history, including the nature of the current symptoms, level of activity, previous cancer history, and comorbidities. Although symptoms vary based on location, most patients present with pain at the site of metastasis caused by destruction of the bone. Metastatic carcinoma to the spine can cause neurologic deficits. A careful physical examination with attention to the potential primary locations for a carcinoma and the area of the skeletal lesion is important. Patients also can present with a soft tissue mass or lymph node enlargement. Laboratory studies might reveal anemia or electrolyte abnormalities, such as hypercalcemia. Specific cancer markers for certain diseases can also be used for diagnosis.

What role does imaging play in diagnosing metastatic carcinoma?

An adult patient with a destructive bone lesion should have plain radiographs of the local site in 2 planes to include the entire bone. Staging studies usually include a computed tomography scan of the chest, abdomen, and pelvis, as well as a technetium bone scan. If you are not absolutely sure the lesion is from metastatic carcinoma, a biopsy of the area should be performed.

How do you determine whether to use surgical or nonsurgical treatment for metastatic carcinoma to bone?

The first question to ask is whether the patient absolutely needs surgery, which is dependent on the patient’s expected survival. If the patient has only 1 bone lesion and is a candidate for surgery, the goal is to stabilize the bone with a pain-free functional joint. Options for surgery include internal fixation, bone grafting, or arthrodesis. If the patient cannot tolerate surgery, a percutaneous vertebroplasty or kyphoplasty can help reduce pain and improve function.
lifespan, activity level, and comorbidities and the patient’s choice. Patients with metastatic carcinoma have a poor prognosis, so palliative care is generally performed to improve their quality of life. The decision to perform surgery often depends on how extensive the surgery will be and whether other nonsurgical options are available that would have the same effect as surgery. An extensive pelvic or spinal surgery in a patient with an expected lifespan of less than 3 months may not be reasonable if effective nonsurgical options exist.

In general, surgical options include the use of intramedullary devices and endoprostheses. The specific type of stabilization or reconstruction depends on the amount of bone destruction and where the lesion is located in the bone. The goal for any surgical treatment is to stabilize as much of the bone as possible to avoid a peri-implant pathologic fracture from a new lesion. For example, if you are treating a patient with metastatic carcinoma to the femoral diaphysis, a reconstruction nail would be used to prophylactically fix the femoral neck. Nonsurgical options include external beam radiation treatment, bisphosphonates, radiofrequency ablation, cryoablation, radioisotopes, and vertebroplasty for spine lesions.

Treatment of a patient with a pathologic fracture requires different techniques than used for the typical trauma patient. For example, a pathologic femoral neck fracture is treated with a prosthetic replacement rather than in situ pinning given the high rate of local disease progression and subsequent hardware failure. Methylmethacrylate is often used to supplement internal fixation in patients with metastatic carcinoma to bone.

What is the rate of reoperation?
We do not have good data on the rate of reoperation after surgery for metastatic carcinoma to bone, but it does occur. Generally, reoperations occur because the cancer has continued to progress in that area. Different types of cancers are more sensitive to radiation, such as breast and lung cancer, so the rate of reoperation is generally lower for those patients. Renal cell cancer does not respond as well to radiation, so reoperations are more likely for those patients.

Do you use an interdisciplinary approach for the treatment of metastatic carcinoma to bone?
It is imperative to work as a team to care for patients with cancer. I work with medical oncologists, radiation oncologists, and the patient’s primary medical team. Patients with metastatic disease have a poor prognosis, but every cancer is different and new drugs are always being developed, so it is important to maintain hope for patients and their families. Depending on the type of cancer, some patients can have a prolonged survival with metastatic disease. As an orthopedic surgeon, the goal is to provide a durable reconstruction so that the chance of reoperation is minimized.

After surgical treatment of a metastatic bone lesion, radiation oncologists will treat the entire area of stabilized bone with radiation to lessen the chance of cancer progression in that area.

What research is currently being conducted for the treatment of metastatic carcinoma?
The focus of research is on new drug development to treat the primary site of disease. For metastatic bone disease, biologic agents, such as bisphosphonates or Rank ligand inhibitors, inhibit osteoclast-mediated bone destruction. New methods to deliver radiation are also being investigated.

What is the 1 teaching point you would emphasize for general orthopedic surgeons?
The biggest point I emphasize is to ensure that the diagnosis of metastatic carcinoma is correct and the cancer is not actually a sarcoma. Adult patients who present with a destructive bone lesion and no history of cancer require a thorough workup that includes a biopsy to make a definitive diagnosis. The likelihood of a destructive bone lesion in an adult patient being metastatic carcinoma is much greater than it being a sarcoma. However, these diseases are treated differently. A patient with metastatic carcinoma to the femoral diaphysis would likely be treated with an intramedullary reconstruction nail, whereas the same patient with a primary sarcoma in the femur would be treated with a wide resection after possible chemotherapy to potentially achieve a cure. Intralesional treatment of a sarcoma can threaten the possibility of saving the limb of that patient.

If there is ever a question about the workup or treatment of an adult patient with a destructive bone lesion, it is best to consult an orthopedic oncologist. If you are absolutely sure that the patient has metastatic carcinoma to bone, then appropriate decision making and potential surgical treatment can be performed by a general orthopedic surgeon.