

CASE STUDY: OSTEOSARCOMA

Joseph Birkman DO, Matthew Goldschmidt OMSIV, Tareen Loqman DO

ArnotHealth

Arnot Ogden Medical Center, Diagnostic Radiology Department, Elmira, NY

LECOMT

PRESENTATION:

A 15-year-old male who presented to the emergency department with a one month history of intermittent moderate left knee pain. The pain began gradually, with no inciting injury, and worse at night. A basic physical exam and left knee x-ray was performed. On the x-ray, a large sclerotic lesion within the proximal tibial metaphysis was discovered. Subsequently this lesion was worked up further with CT, MRI, and Nuclear medicine bone scan, due to increasing concern for Osteosarcoma.

BACKGROUND:

Osteosarcoma is a common osseous malignancy present in children and adolescents. It is most commonly found around the metaphysics of lower extremity long bones. Patients typically present with night pain with or without mass, limited motion, and erythema without clinical signs of systemic infection. They may also present as a pathologic fracture.

RADIOLOGIC FINDINGS:

Medullary and cortical bone destruction, wide zone of transition, aggressive periosteal reaction, soft tissue mass, and avid enhancement.

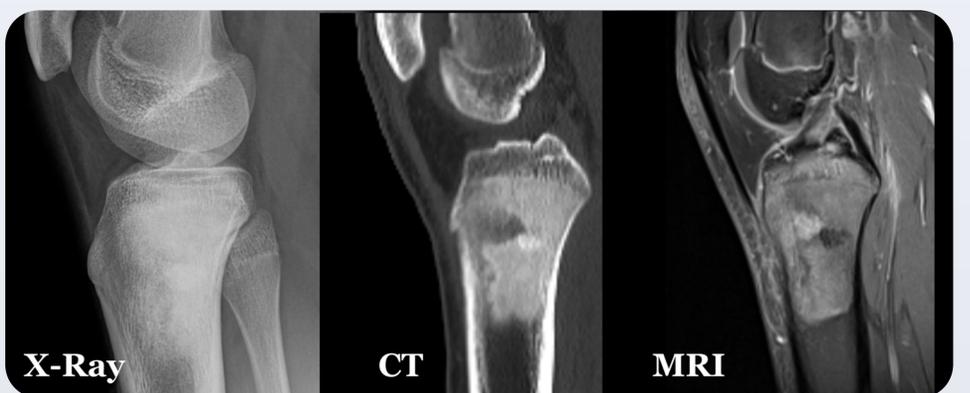
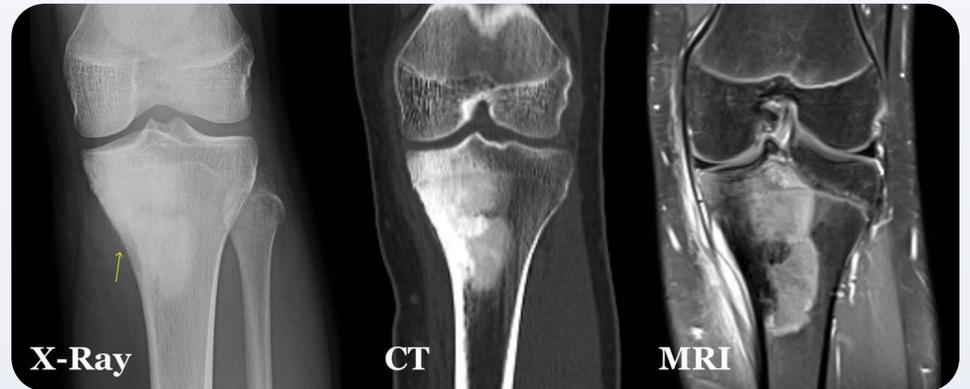
PROGNOSIS:

The prognosis of this disease has changed significantly with the advances in modern medicine. Prior to chemotherapeutic advances, osteosarcoma resulted in almost 100% mortality. Today, the treatment of osteosarcoma generally consists of preoperative chemotherapy, wide surgical resection and postoperative chemotherapy consisting of Methotrexate, Adrimycin, and Cisplatin. Even with the developments of modern chemotherapy which continues to advance, resection of malignancy is critical to remission and survival.

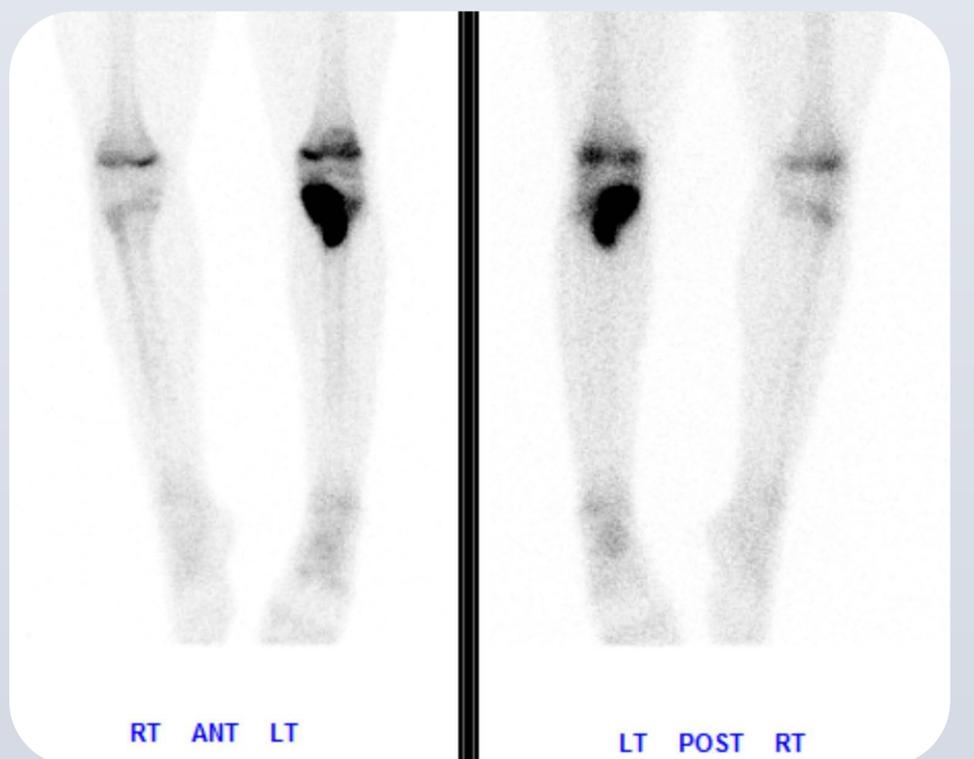
SURGICAL MANAGEMENT:

Just like the chemotherapeutic therapy has advanced, the surgical management of these patients has also changed with time. Historically, amputation was the treatment of choice to control disease. The modern techniques for treatment of osteosarcoma include limb salvage and reconstruction, which has become the standard of care for these patients.

Limb salvage surgery highlights the complexity of the modern approach to patients with osteosarcoma, which include a combination of endoprosthetic devices, allograft, and biologic constructs. Endoprosthetic devices rely on bone-to-metal healing and provide a stable fixation point of the internal environment to external prostheses. Allograft reconstruction rely on biologic integration of bone and are a permanent replacement for bone loss. The surgical incision is able to be closed primarily and allows for a theoretically lower risk of infection after integration. The drawbacks include nonunion, infection, and malunion. The modern approaches to the treatment of osteosarcoma in children have turned a virtually universal fatal disease into one which patients will be able to survive and thrive for the rest of their life.



Above are coronal and sagittal images of the proximal left tibia on x-ray, CT, and contrast enhanced MRI. Within the medial left tibial metaphysis there is a large sclerotic lesion, with mild adjacent periosteal reaction and soft tissue edema, along with extension of the lesion superiorly into the proximal epiphysis. Contrast enhanced MRI demonstrates strong enhancement throughout the sclerotic lesion.



Coronal anterior and posterior nuclear medicine bone scan demonstrates avid uptake of radiotracer within the proximal left tibial metaphysis and epiphysis in the same distribution of osseous lesion on the above images, as well as mild uptake within the distal physis of the left femur.

CONTACTS

Joseph Birkman, D.O. - jbirkman@arnothealth.org
Matthew Goldschmidt, OMSIV - MGoldschmi13458@med.lecom.edu
Tareen Loqman, D.O. - DAllington@arfl.com