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Case Report

Pathologic Fracture in a Young Basketball Athlete

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Abstract

Bone fractures are commonly due to a high-velocity injury, especially in younger individuals. Fractures resulting from a low-impact mechanism should raise suspicion of an underlining pathological process. This case explores non-ossifying fibroma as an underlining cause of pathological fracture in a young basketball athlete.

Keywords: Non-ossifying fibroma, Pathological fracture, Benign bone tumor, Basketball.

BACKGROUND

Pathologic fractures are usually low-impact fractures resulting from an underlining bone metabolic or oncologic process. The bone structure hence weakens resulting in vulnerability to injury. It is estimated to affect around 8% of individuals with metastatic bone tumors. Osteoporosis is another highly prevalent etiology of pathological fractures in seniors affecting about 40% of individuals over the age of 50 years. Non-ossifying fibroma (NOF) is a benign bone tumor caused by abnormal ossification affecting long bone metaphysis. This case demonstrates a young basketball player presenting with a fracture after a low-impact injury that is otherwise not known to cause such damage.

CASE PRESENTATION

15 y.o. male sophomore basketball player presented to the emergency room with a complaint of acute worsening of subacute pain in the left proximal tibia. This occurred while playing basketball when he landed from a simple jump and instantly felt a pop with severe pain and swelling. He was unable to bear any weight and eventually had to quit the game and was taken to the ED. He reported a 6-week history of mild dull aching pain only with weight bearing at the same location where he felt the pop and has not been evaluated for that before this time. He denied nighttime pain, weight loss, or fever and has otherwise no pertinent past medical or surgical history.

Examination of the left proximal tibia revealed intact skin with swelling and deformity distal to the knee joint with tenderness noted slightly distal to the tibial tuberosity. The knee exam was limited due to apprehension and deformity and a normal neuromuscular exam was established. Blood work was unremarkable and a 2-view X-ray of the tibia and fibula showed pathologic complete fracture through the proximal tibial metaphysis with mild dorsal displacement of the tibial shaft. The fracture appeared to be through a cortically based lytic lesion in the posterior tibial cortex suggesting Non-ossifying Fibroma (NOF) (Figures 1 & 2).

Figure 1: Eccentric placed NOF with well defined Radiolucency, Its length usually exceeds its width

Figure 2. Fracture line well visualized through a lateral view

Orthopedic consultation was obtained and the patient underwent uneventful open reduction and internal fixation with inter-medullary nail placement (Figure 3) and open biopsy was obtained and sent for histopathology confirming NOF. On postoperative day one and with good pain control, the patient was able to tolerate 50% weight-bearing and was discharged home with outpatient physical therapy and 2 weeks follow-up for stable removal and repeat imaging.

Figure 3: Post internal fixation and inter medullary nail placement radiograph

DISCUSSION AND CONCLUSION

Benign bone tumors are more common than malignant ones, fortunately. According to the American Academy of Orthopedic Surgeons (AAOS), the most common type of benign bone tumor is an osteochondroma with a prevalence between 35 and 40 percent of all benign bone tumors. NOF is the most common type of benign fibrous lesion that occurs in the metaphysis of the long bones affecting mainly the femur and tibia. Asymptomatic small NOF can be found in approximately 30 % of people in the first and second decade and are usually self-limited and spontaneously disappear by the age of 25 years. Large NFO (>3.3 cm) increases the risk of pathologic fracture as seen in our patient.

Diagnosis can be made with unique characteristic radiographic features. Patient with small asymptomatic lesions can be reassured and doesn't need follow-up imaging. Others with bigger lesions may require serial radiographs to follow the evolution and those with symptoms and a high risk of fracture might require a prophylactic surgical intervention with curettage and bone grafting or excision. Some experts can estimate the risk of fracture based on the diameter of imaging findings. NOF carries a lower risk of recurrence compared to other benign tumors.

Sustaining fracture with low impact injury should raise suspicion of possible underlining bone pathology. Benign bone tumors including NFO most commonly found incidentally in patients with pain or presenting with a pathologic fracture. Radiologic tumor characteristics can assist physicians in making the diagnosis in-addition to serum tumor markers and biopsy as indicated. Even though most small asymptomatic benign tumors can be managed conservatively, proper management of pathologic fractures with internal fixation is very important especially if the fracture is involving the growth plate in skeletally immature individuals.

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