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Musculoskeletal

Post-traumatic osteochondroma of the distal femur

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ABSTRACT

Osteochondroma are the most common benign primary bone tumor. They are bony outgrowths surrounded by a characteristic cartilaginous cap, most commonly arising from the long bones. They are most often asymptomatic, usually discovered as incidental findings before the third or fourth decade of life. Although the exact pathogenesis is not fully established, there have been reports of these tumors arising after incidents such as fractures, trauma, radiation, and stem cell transplants. There have been only a few cases describing the development of osteochondroma after traumatic events. This report presents a documented case of an osteochondroma arising at the site of a previous femoral fracture, 10 years after the initial trauma.

Introduction

Osteochondromas are a benign bone tumor that most commonly affects long bones such as the femur and tibia. They are estimated to affect 1%-2% of the population, with most cases being asymptomatic. Diagnosis is most commonly made with plain films, but may also be seen on computed tomography (CT) and magnetic resonance imaging (MRI). The exact pathogenesis of is not fully established, but there have been several reported cases of osteochondromas arising after trauma. Here, we present a rare case of an osteochondroma arising at the site of a Salter II fracture of the distal femur 10 years after the initial injury and repair.

Case report

A 24-year-old woman with no pertinent medical history presented to the orthopedics department at our institution with complaints of pain and discomfort in both the anterior and the posterior aspects of her right knee for several months, which is worsened with activity. She had a Salter Harris II fracture of her right distal femur in 2006 at the age of 13 after being involved in a motor vehicle accident. This fracture was repaired with open reduction and internal fixation, with subsequent removal of hardware in 2007.

Her initial X-ray of the symptomatic knee taken at this visit revealed an osseous protuberance arising from the posterior aspect of the distal femoral diametaphysis, suggestive of an osteochondroma. This finding is in the same anatomic location of the prior Salter Harris type II fracture (Fig. 1A and B).

Additional CT image of the right knee taken shortly after the trauma showed fracture through an open physis, demonstrating that the patient exhibited growth potential at the time of trauma (Fig. 2A and B). A radiograph of the left knee from the date of trauma is also provided to demonstrate the unclosed physis (Fig. 3). A radiograph of the right knee shortly after fixation is also provided (Fig. 4A and B).

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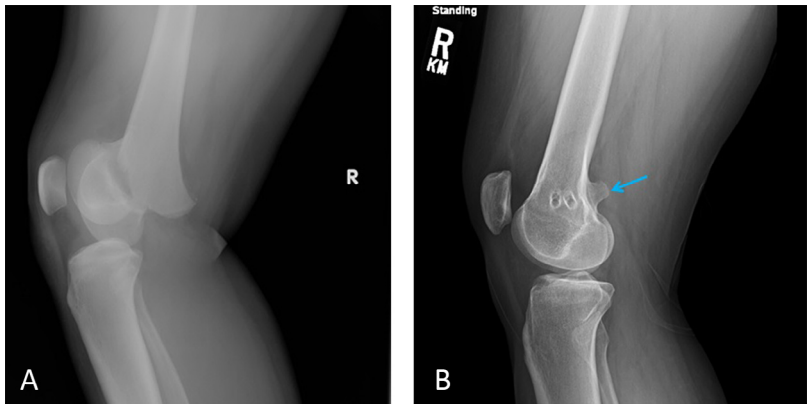

Fig. 1 – (A) Radiograph of right knee taken in emergency department in 2006 shortly after initial trauma. Salter Harris type II fracture is noted. (B) Radiograph of right knee taken approximately 10 years after the initial inciting traumatic event. Note the osseous protuberance (blue arrow) arising from the posterior aspect of the knee, in the same location as the initial fracture.

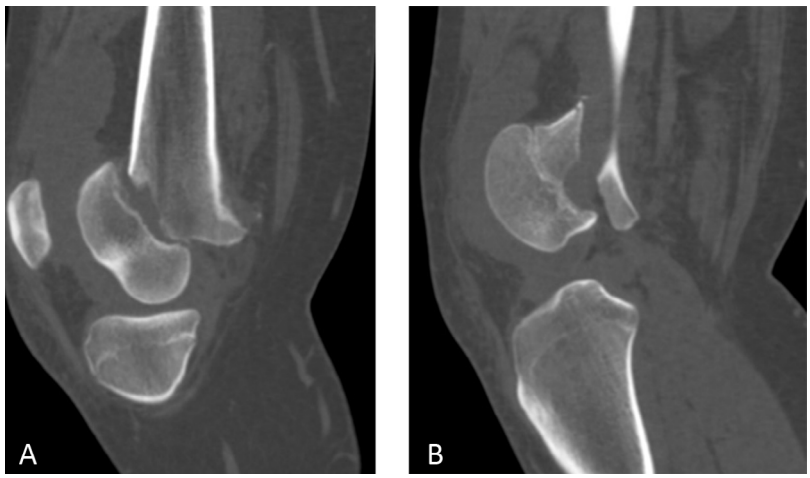

Fig. 2 – Computed tomography (CT) of right lower extremity on the day of initial trauma, showing (A) fracture through the physis of the right femur. (B) Sagittal reconstruction obtained at the same level of the fracture in a more lateral location, showing unfused physis, indicating skeletal immaturity at time of trauma

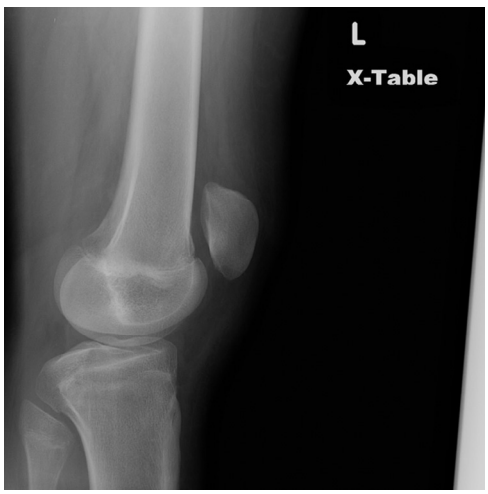

Fig. 3 – Radiograph of left knee from day of trauma, showing open physis, supporting maintained growth potential at time of trauma.

A follow-up MRI of the extremity was performed 1 month after the orthopedics department visit to correlate with the CT examination performed during the initial trauma. This MRI revealed a 1.1 × 1.4 cm osseous protuberance arising from the region of the prior trauma, specifically the posterior medial aspect of the distal femoral metaphysis near the insertion of the adductor magnus tendon. This lesion showed marrow continuity with the adjacent metaphysis, a finding compatible with osteochondroma (Fig. 5A-D).

The patient was managed conservatively with physical therapy and serial follow-ups. Over the course of 6 months, the patient reported improvement in pain with physical therapy.

Discussion

Osteochondromas are the most common benign bone tumor. They are bony outgrowths surrounded by a cartilaginous cap and arise on the external surface of bones [1]. They can occur