Indonesian Journal of Medicine (2022), 07(01): 82-88
Masters Program in Public Health, Universitas Sebelas Maret

Case Report

Osteochondroma of the Distal Femur in Young Patient: An Oncology Case Report

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ABSTRACT

Background: Osteochondroma is the most common primary bone tumor manifested as a painless, slow-growing mass. Apart from its asymptomatic manifestations, the tumor is malignant potential so appropriate management needs to be acknowledged. The aim of this study is to discuss the possible clinical findings for diagnosing with managing this rare case properly, which may provide a good outcome for this patient.
Case Presentation: A 17-year-old male presented with a chief complaint of a slow-growing lump on the back of his right thigh. On physical examination, a 7 cm x 6 cm mass with mild tenderness was found during palpation. Based on these clinical and imaging findings, we informed and gained consent from the patient for surgery followed by a histopathology examination. The histopathology examination confirmed osteochondroma in the right distal femur.
Results: Surgery was performed to curatively remove the tumor, followed by a histopathological examination which confirmed the diagnosis of osteochondroma. One week after the surgery, the post-surgical wound care was performed showing an excellent result, without any signs of infection or complications.
Conclusion: Typical manifestation of painful osteochondromas may be associated with mechanical compression to the surrounding nerve and vascular structures. Surgical excision is an appropriate management approach to provide consistent relief of pain and deformity in osteochondroma case.

Keywords: arteriovenous malformations, CT scan, rare case, embolization

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Cite this as:
Sandiwidayat KS (2022). Osteochondroma of the Distal Femur in Young Patient: An Oncology Case Report. Indones J Med. 07(01): 82-88. https://doi.org/10.26911/theijmed.2022.07.01.09.

BACKGROUND

Osteochondroma is the most common primary bone tumor comprising over one-third of benign bone tumors (Jeevannavar et al.,) It accounts for up to 35% of all benign bone tumors and 8% of all bone tumors (Kitsoulis et al., 2008) The most common sites for osteochondroma are the distal femur, proximal tibia, and proximal humerus (Hassankhani, 2009). Most lesions appear in children and adolescents as painless, slow-growing masses and may go unnoticed. Its incidence is probably higher than published. Eighty-five percent of bone tumors diagnosed as osteochondromas are solitary lesions (Florez et al., 2008)

Diagnosis is most commonly made with physical examinations properly, and plain imaging, but may also be seen on computed tomography (CT) and magnetic resonance imaging (MRI). The exact pathogenesis of osteochondroma is not fully

understood, but there have been several discussed cases of osteochondromas arising after trauma, or genetic disturbance (Tepelenis et al., 2021)

In theoretically, Osteochondromas are developmental malformations that occur from aberrant cartilage cells on the surface of the bone. This layer of cartilage, called the cartilaginous cap, is where growth arises. The growth of these cartilaginous cells is similar to the normal epiphyseal growth plate, and when the epiphysis of the bone closes, the osteochondroma stops growing. As the cap grows outward, the bone beneath the cap ossifies, becoming a continuous extension of the cortex covered by periosteum (Tristano et al., 2006)

Here, we report osteochondroma in young patients with classic manifestation findings and management without any occurrence of complications.

CASE PRESENTATION

A 17-year-old male came to the orthopedic outpatient clinic in Sanglah General Hospital with a chief complaint of a growing lump on the back of his right thigh in the past 14 months (see Figure 1). The patient said that the lump did not gradually get bigger. Pain on his right thigh was felt intermittently but was neither affected by nor bothering his daily activities. According to his past medical history, he had a history of malignancy or weight loss. Hence, no family history of benign or malignancy tumors was reported.

The physical examination showed a solid lump at the distal part of the thigh with normal skin findings. There was mild tenderness on palpation, with measurement results showing a circumferential femur diameter of 46 cm, lump size of 7 cm x 6 cm, immobile, well-defined margin, capillary refill time < 2", palpable dorsal pedis artery, SpO2 98%, and normal sensation (see Figure 1). The active range of motion (ROM) of the knee was 0/135, the active ROM of the ankle was 50/70, and the active ROM of metatarsophalangeal/interphalangeal joints was 0/90.

Radiography examination results in exostosis sessile on the right metadiaphysis femoral one-third distal posteriorly, which combined with a narrow transitional zone, chondroid ring, and arc calcification matrix without periosteal reaction (see Figure 2). Meanwhile, an ultrasound examination revealed a cartilage cap with calcification posteriorly with muscle distortion surrounding the distal posteromedial of the right femoral (see Figure 3).

Based on these clinical and imaging findings, we informed and gained consent from the patient for surgery (see Figure 4a), followed by a histopathology examination (see Figure 4b). The histopathology examination confirmed osteochondroma in the right distal femur. One week after the surgery, the post-surgical wound care was performed showing an excellent result, without any signs of infection or complications. A radiography examination was performed to reevaluate the bone mass (see Figure 5).

RESULTS

Further investigation revealed the findings suggesting by Radiography examination results in exostosis sessile on the right metadiaphysis femoral one-third distal posteriorly, which combined with a narrow transitional zone, chondroid ring, and arc calcification matrix without periosteal reaction, Meanwhile, histopathology examination (see Figure 4b). The histopathology examination confirmed osteochondroma in the right distal femur.

This findings were confirmed of the diagnosis osteochondroma. Subsequently, our patient was admitted for further

management such as surgery to remove the mass. Fortunately, the patient was recovery well without any signs of infection or complications. We scheduled the patient for a CT-Scan evaluation and the physical examination begins 1 year after surgery.

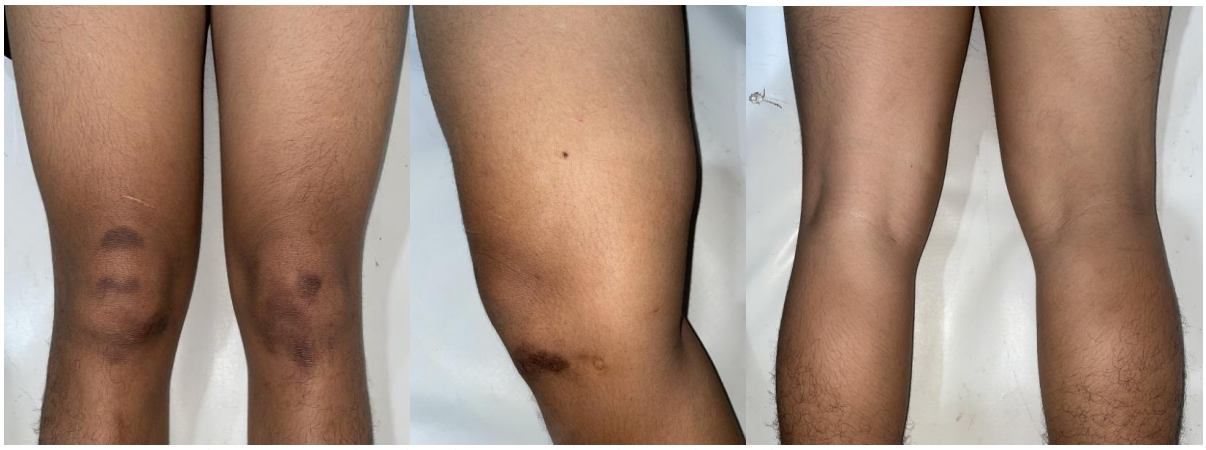

Figure 1. Physical examination visualized a lump on the back of the right thigh.

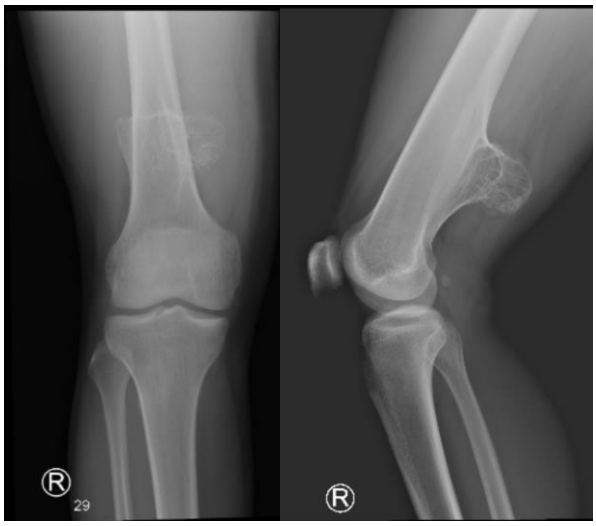

Figure 2. Radiography with anteroposterior and lateral view suggests osteochondroma in the right femur.

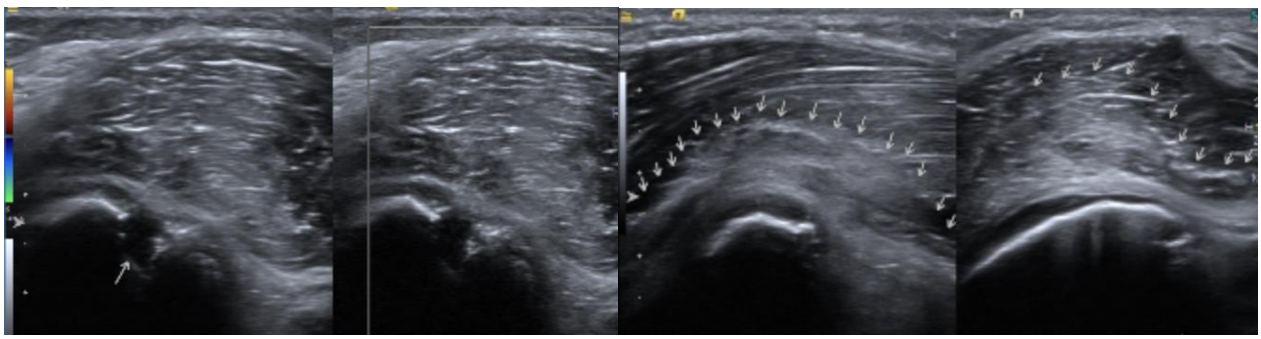

Figure 3. Ultrasound of right knee.

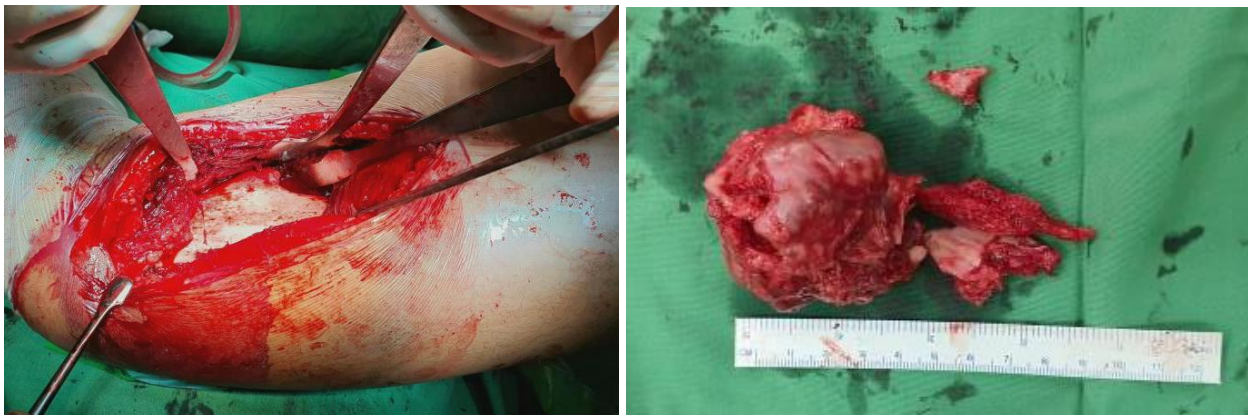

Figure 4. (a) Intraoperative view in the femur, (b) Osteochondroma tissue

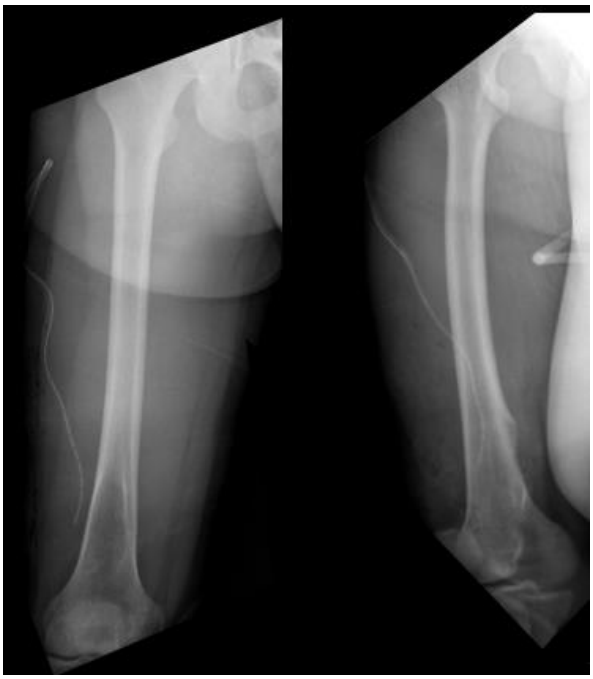

Figure 5. Post-operative radiography with an anteroposterior and lateral view

DISCUSSION

Osteochondroma is classified into two types, i.e., the sessile or pedunculated. It commonly occurs within the metaphysis, typically projecting away from epiphysis (Passanise et al., 2011) The mass manifests as a benign cartilage-capped outgrowth, connected to bone by a stalk and the most frequently observed in the neoplasm of the skeleton. Osteochondroma is sometimes referred to as osteocartilaginous exostosis (Salgia et al., 2013)

The common predilection of osteochondromas is around the knee (50%), in which the distal femur is the most common site (Passanise et al., 2011). Alyas et al. (2007) explained that osteochondroma remains mainly asymptomatic and is usually diagnosed incidentally on radiographs that were obtained for other reasons. Atypical manifestation was found in our case, where the patient's lump on the back of the right thigh grows with pain. Motamedi et al. mentioned that the second most frequent appearance of osteochondroma is a painless

palpable lump on the involved bone (Motamedi and Seeger, 2011) These bumps can produce cosmetic issues, especially at the proximal tibia and the ribs where they are readily evident and palpable.

Occasionally, an osteochondroma might put pressure on a nerve leading to numbness and tingling in the limb (Mnif et al., 2009) It may also compress a blood vessel resulting in periodic changes in blood flow, loss of pulse, and changes in the color of the associated limb. Other vascular complications encompass arterial thrombosis, venous thrombosis, and aneurysm or pseudoaneurysm formation. The popliteal artery, common peroneal nerve, and posterior tibial nerve are the most frequently affected (Raherinantenaina et al., 2016) Gavanier et al. stated that symptomatic presentation is commonly caused by mechanical compression of adjacent structures, fracture, bursitis, or malignant transformation (Gavanier and Blum, 2017)

Bottner et al. (2003) stated that the incidence of sarcomatous change in patients with osteochondroma has been reported to be only 1%. Hence, only one case of malignant transformation was reported in 134 patients of three families with multiple hereditary osteochondromas. Salgia et al. (2013) mentioned that an exophytic bone lesion contains a cartilaginous cap >1 cm in height or if there is associated pain, it is thought to be a higher risk for the lesion representing a chondrosarcoma.

The differential diagnosis of osteochondroma includes synovial chondromatosis, osteochondroma, large osteophyte, and pigmented villonodular synovitis Treatment of osteochondroma of the distal femur consists of surgical removal, which is useful in eliminating painful symptoms and avoids possible transformation of the neoformation (Singh, 2012). Early preventive resection is necessary to avoid the risk of transformation of the mass into malignant chondrosarcoma (Maheshwari et al., 2006). On the other hand, Lin et al. explained that osteochondroma can resolve spontaneously, and conservative treatment is always the first choice to avoid unnecessary surgery. Wengrowicz et al. reported that the most common documented locations involved in spontaneous regression of osteochondromas were the distal femur and proximal humerus. This finding may be explained due to the higher incidence of osteochondromas in these locations (Stitzman-Wengrowicz et al., 2011) In conclusion, osteochondroma most frequently occurs in the long bones such as the tibia, femur, and humerus. It usually presents cosmetic deformity and symptoms produced by mechanical compression of surrounding structures. A sudden increase in the size of the tumor with associated pain should raise a suspicion of malignant transformation. It needs to measure the size of the cartilage cap to determine the measurement of malignant transformation. Surgical excision provides consistent relief of pain and deformity and improves range of motion if restricted.

This case report was osteochondroma with excellent results after surgery in 17 year old patient, Unfortunately, The limitations of this case report is short of follow up, Ideally the surgical intervention requires a minimum 12 – 32 months follow up duration. Nevertheless, further comparative study with a longer follow up is needed for better establisment of surgical intervention choice.

FINANCIAL AND SPONSORSHIP

None.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

The authors declare that the study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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