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**Case report**

# A Case Report of an Infant with Proximal Tibia Mass

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## ABSTRACT

**Background:** Congenital cartilage masses can cause pain and restrict joint movement. This mass can be used in the differential diagnosis of osteomyelitis and other benign cartilage masses, such as osteochondroma and chondroma.

**Case description:** In this report, a 51-day-old boy with a pathological diagnosis of cartilage mass in the proximal tibia is introduced. The patient had normal growth and development and was referred due to presence a mass below his right knee. Based on the pathological findings, the final diagnosis was congenital cartilage mass.

**Conclusion:** The presence of a cartilage mass can mimic the symptoms of osteomyelitis, and since treatment for osteomyelitis must be performed promptly, it is important to distinguish between congenital cartilage masses and osteomyelitis. In addition, the presence of the cartilage mass in the patient affected joints movement and caused pain, indicating the importance of the need for intervention.

**Keywords:** Osteomyelitis; Congenital Cartilage Mass; Osteochondroma; Chondroma; Dysplastic Osteofibrosis

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## INTRODUCTION

Benign tumors of bone and cartilage include osteochondromas, chondroma, giant cell tumor, aneurysmal bone cyst, non-ossifying fibroma (NOF), osteoid osteoma, osteoblastoma, and fibrous dysplasia (1). Osteochondroma, also clinically known as exocytosis, is a benign tumor with a cartilaginous cap attached to its lower skeleton by a bony stem. About 85% of osteochondroma cases are seen as part of multiple inherited exhaust syndrome. Single osteochondromas are usually first diagnosed in late puberty and early adulthood, but multiple osteochondromas appear in childhood. Men are three times more likely to be affected than women. Osteochondromas develop in bones of cartilages origin and originate from the metaphysis near the growth plate of long tubular bones, especially near the knee (2).

Chondromas are benign tumors of the hyaline cartilage that usually develop in bones of cartilaginous origin. Enchondromas are usually diagnosed in people in their 20s and 50s. These tumors usually present as single metaphysis lesions in the tubular bones of the hands and feet (2).

Giant cell tumor is named so because in its histology, the multinucleated giant cells from osteoclast type are dominant. The disease is a neoplasm with local invasion, which mainly affects adults. The disease originates from the epiphyses of the long bones, especially the distal femur and proximal tibia. These tumors are usually close to the joint and cause arthritis-like symptoms.

Aneurysmal bone cyst is a benign tumor characterized by bloody, multi-cavity, cystic spaces. It usually appears during the first two decades of life. The most common sites of aneurysmal bone cyst are the metaphases of the long bones and posterior elements of the vertebral body.

Non-ossifying fibroma is a benign mesenchymal proliferation and possibly a reaction that may occur in 50% of children and young adults. If NOF is limited to the cortex or medulla, it is also called fibrous cortical defect and metaphysical fibrous defect, respectively. Most NOFs originate eccentrically from the distal femur and proximal tibia metaphysis. A plain radiograph shows an oval radiolucent lesion with a well-defined margin whose long axis is parallel to the cortex (1).

Osteoid osteoma and osteoblastoma are benign bone-forming tumors with similar histological aspects but different clinical and radiography features. By definition, osteoid osteomas are less than 2 mm in diameter and more common among young men. About 50% of cases involve the femur or tibia, which are mainly originated from the cortex. There is usually a thick edge of the cortex that maybe the only radiographic sign. Osteoblastomas are larger than 2 mm and involve most of the posterior components of the vertebrae i.e. lamina and pedicle (1). Osteomyelitis is relatively common in children. Staphylococcus aurous is the most common cause of osteomyelitis at all ages, even during infancy. In addition to S. aurous, group B Streptococcus and gram-negative bacilli such as Escherichia coli also cause osteomyelitis in infants. Osteomyelitis is more common in boys than in girls. Most osteomyelitis cases occur in healthy children as hematogenous. The condition is also the most common predisposing factor for minor trauma, which is seen in approximately 30% of cases (3).

Dysplastic osteofibrosis is a benign lesion that occurs in the long bones, and rarely affects infants. Dysplastic osteofibrosis is very difficult to diagnose in infants and sometimes confused with a number of congenital tumors or tumor-like lesions. In these cases, a biopsy is needed. In 2015, a study reported a 7-day-old baby girl with a dysplastic diagnosis of osteofibrosis (4).

In this report, a 51-day-old boy with a pathological diagnosis of cartilage mass in the proximal tibia is presented.

## CASE PRESENTATION

The patient was a 51-day-old boy, the last born child of a 27-year-old mother

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(G4P4L4) and the result of normal vaginal delivery. The patient had no problem during childbirth. He had normal growth and development and was fully vaccinated. The patients was admitted to the Taleghani Pediatric Hospital in Gorgan (Northeastern Iran), in January 2021, with a complaint of a mass below his right knee. The proximal mass of the right tibia bone has been present since birth. Since then, the extension of the right knee has been limited and its movements have caused the child restlessness. According to the patient's mother, the lower right limb had no active movement and did not provide a history of trauma, fever, respiratory distress, and poor feeding.

At birth, the only positive clinical finding in the newborn was a proximal tibia mass. The mass was tender and without erythema or warmness. The baby was not restless and kept his right knee in a flexion position, which could be extensible passively. Ultrasound showed a cystic regional mass with approximate size of 2.5 × 5 × 2.5 mm. For further examination, X-ray and magnetic resonance imaging (MRI) were requested. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were normal. In radiographs of the face and profiles of the right knee, a cystic mass was detected with indeterminate margins in the proximal tibia, metaphysis, and diaphysis (Figure 1). The patient was discharged based on the MRI findings and followed-up.

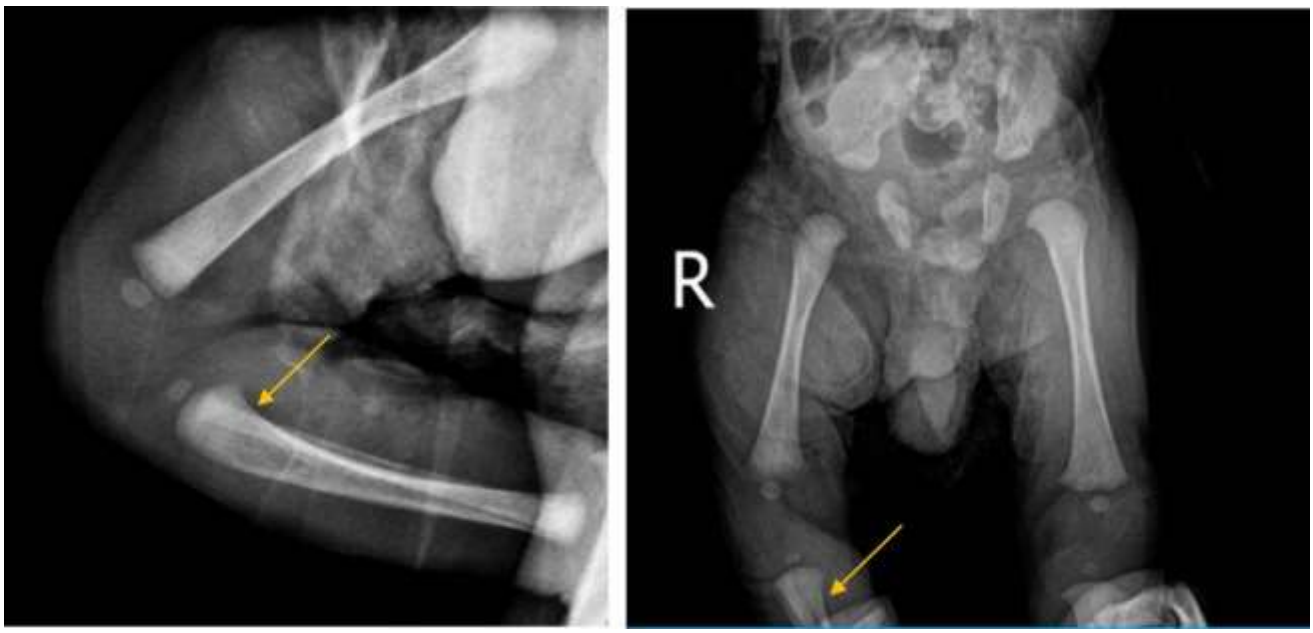


**Figure 1. X-ray radiographic image of the proximal tibia**

Before going to the hospital, at 10 days of age, the MRI of the mass site showed a heterogeneous lucent area with internal sclerotic foci, in which irregularity and the possibility of disruption of the adjacent bony cortex and soft tissue swelling were reported. Due to the age and the bone involvement, one of the main diagnosis was sub-acute focal osteomyelitis and MRI scan with contrast was requested. At 31 days of age, the MRI of the right lower extremity was performed with contrast. The findings showed that the lesion of the proximal metaphyseal medial portion of the right tibia was larger than the previous MRI. In addition to the focal destruction of the adjacent cortex, evidence of spectrum formation with adjacent soft tissue was observed in an area of 18 mm in diameter, which mostly presented evidence of sub-

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acute to chronic osteomyelitis. Accordingly, the cases was hospitalized at 51 days for treatment.

The patient's mother had thrombocytopenia during pregnancy, which improved after pregnancy. The patient's parents had no-kinship and were of Afghan descent. The parents reported no family history of the disease.

After the patient was admitted to the Taleghani Children's Hospital due to the suspicion of osteomyelitis, he was treated with antibiotics and orthopedic consultation was requested. (Table 1) presents the laboratory findings of the patient during hospitalization.

Table 1. The laboratory findings of the patient during hospitalization

| At admission | | Before surgery; the 2th day of hospitalization | Postoperatively; the 3th day of hospitalization |
|---|---|---|---|
| **Complete blood count** | | | |
| WBC (Count/µl) | 7700 | 8800 | 8200 |
| RBC (Count/µl) | 3.57 | 3.41 | 2.87 |
| Hb (g/dl) | 9.7 | 9.7 | 8.1 |
| Hct (%) | 30.7 | 28.1 | 24.5 |
| MCV (fl) | 85.99 | 82.4 | 85.37 |
| MCH (Pg) | 27.17 | 28.45 | 28.22 |
| MCHC (g/dl) | 31.6 | 34.52 | 33.06 |
| PLT (Count/µl) | 277000 | 286000 | 245000 |
| Poly (%) | 17 | 90 | 77 |
| Lymphocyte (%) | 83 | 10 | 21 |
| Eosinophil (%) | NA | NA | 2 |
| MPV (fl) | 8.5 | 9.7 | 9.5 |
| **Serology** | | | |
| CRP | Negative | NA | Negative |
| **Hematology** | | | |
| ESR (hrs) | 9 | NA | NA |
| **Biochemistry** | | | |
| BUN (mg/dl) | 7 | NA | 7 |
| Creatinine (mg/dl) | 0.5 | NA | 0.5 |
| Na (mmol/l) | 141 | NA | NA |
| K (mmol/l) | 4.9 | NA | NA |
| **Urine analysis** | Normal | NA | NA |
| Urine culture | No growth after 24 h | NA | NA |
| Blood culture | No growth after 72 h | NA | NA |

WBC: white blood cell, RBC: red blood cell, Hb: hemoglobin, Hct: hematocrit, MCV: mean corpuscular volume, MCH: mean corpuscular hemoglobin, MCHC: mean corpuscular hemoglobin concentration, PLT: platelet, MPV: mean platelet volume, CRP: C-reactive protein, ESR: erythrocyte sedimentation rate, BUN: blood urea nitrogen. NA: not assigned.

According to recommendation of orthopedist specialist, the infant underwent an excisional biopsy on the second day of hospitalization, and the sample was sent to a pathology laboratory for examination. One day after the surgery, the infant developed fever that was controlled with acetaminophen. Later, the infant's general condition was good and the fever did not recur. Antibiotic treatment was continued until the pathology report was ready. On the 9th day of hospitalization, the pathology report was received and indicated a congenital cartilage mass probably originated from growth plate, with no presence of granuloma, inflammation, and

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tumor. The final diagnosis was congenital cartilage mass. The antibiotic treatment was discontinued and the patient was discharged with cephalexin syrup.

## DISCUSSION

This case shows that the presence of a cartilage mass can mimic the symptoms of osteomyelitis, and since treatment for osteomyelitis must be performed promptly, it is important to distinguish between congenital cartilage masses and osteomyelitis. In addition, the presence of the cartilage mass in the patient affected joints movement and caused pain, indicating the importance of the need for intervention.
In review of literature, there was no other case with this condition. In addition, the pathological diagnosis of the present case does not match the pattern of osteoporosis dysplasia reported by Kim and Lee (4). In the mentioned study, the case presented was a 7-day-old girl with a diagnosis of congenital osteofibrous dysplasia. The two cases also differ in age and pattern of involvement to osteochondroma and chandroma as benign cartilage masses.

## CONCLUSION

It is necessary to conduct more studies on cartilage masses that limit joint movement and cause pain in infants and how to distinguish such cases from osteomyelitis.

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## DECLARATIONS

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Not applicable.

### Ethics approvals and consent to participate

Consent was obtained from the patient's parents for publication after ensuring confidentiality of personal information.

### Conflict of interest

The author declare that there is no conflict of interest regarding publication of this article

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