Annals of Bone and Joint Surgery

Case Report
Published: 24 Jun, 2023

Periosteal Chondroma (Ecchondroma) of the 1st Metacarpal Bone: Case Report

Tabladillo SB[1], Kamegaya M[2], Saisu T[2] and Tomaru Y[2]*

[1]*Department of Orthopedics, Mariano Marcos Memorial Hospital & Medical Center, Philippines*

[2]*Chiba Child & Adult Orthopedic Clinic, Yoh Memorial Hospital, Japan*

Abstract

Chondromas are benign cartilaginous tumors that are common lesions of the hand. Most chondromas are enchondromas, meaning that they develop within the bone marrow. Periosteal chondroma, in contrast, is a less common, slow-growing, sharply demarcated tumor composed of hyaline cartilage and developed in contact with the periosteum, either within the periosteal membrane or between the periosteum and the bone. We present a case of a periosteal chondroma that involved the metacarpal of the right thumb for 13 years and was associated with pain after blunt trauma. The tumor was successfully treated by marginal resection.

Keywords: Chondroma; Benign bone tumor; Metacarpal bone

Introduction

Chondromas are benign cartilaginous tumors that are common lesions of the hand [1]. Most chondromas are enchondromas, meaning that they develop within the bone marrow. Periosteal chondroma, in contrast, is a less common, slow-growing, sharply demarcated tumor composed of hyaline cartilage and developed in contact with the periosteum, either within the periosteal membrane or between the periosteum and the bone. Periosteal chondromas may account for 2% of all chondromas [2]. The term "periosteal chondroma" implies that the site of origin is the periosteum, as indicated by histological and radiographic evidence, and it is more generally accepted than the older term juxtacortical chondroma, which was coined by Jaffe in 1956 [3]. The tumor usually develops on the surface of tubular bones in young adults (20 to 40 years old) [4].

The purpose of this report is to describe an uncommon chondrogenic tumor in a rare location and a younger age.

We present a case of a periosteal chondroma that involved the metacarpal of the right thumb for 13 years and was associated with pain after blunt trauma. The tumor was successfully treated by marginal resection.

Case Presentation

A 14-year-old right-handed girl presented with a nodule on the dorsum of her right thumb for approximately 13 years. The nodule gradually enlarged but it was asymptomatic. Her mother took the patient to a pediatrician when she was 1 year old and suspected a floating thumb on the right hand. However, the patient and family did not want any further follow-up. After a blunt trauma to the thumb (allegedly hitting her hand in a trash can) 2 days prior to medical consultation, the patient developed mild to moderate pain. The patient was subsequently referred to our institution.

Physical examination revealed protuberant, subperiosteal mass measuring 20 mm × 18 mm × 8 mm, located on the dorsoradial aspect, metacarpal area of the right thumb (Figure 1). The mass was rubbery, well-defined, non-mobile and with mild to moderate tenderness. It was adherent to the first metacarpal bone and the overlying skin. The skin was apparently normal.

Radiographs of the thumb shows well-demarcated bone mass with matrix calcification and a thin cortical shell of the first metacarpal bone (Figure 2).

Magnetic Resonance Imaging (MRI) revealed a lesion attached to the dorsolateral surface of the first metacarpal bone. The lesion has hypointense and homogeneous on T1-weighted images (Figure 3A). Fat suppression T2-weighted images showed the lesion to be marked hyperintense and

Correspondence:
Stephen B Tabladillo, Department of Orthopedics, Mariano Marcos Memorial Hospital & Medical Center, Brgy San Julian Batac City, 2906, Philippines, E-mail: orthodoctip@yahoo.com

Received Date: *07 Jun 2023*
Accepted Date: *20 Jun 2023*
Published Date: *24 Jun 2023*

Citation:
Tabladillo SB, Kamegaya M, Saisu T, Tomaru Y. Periosteal Chondroma (Ecchondroma) of the 1st Metacarpal Bone: Case Report. Ann Bone Joint Surg. 2023; 4(1): 1012.

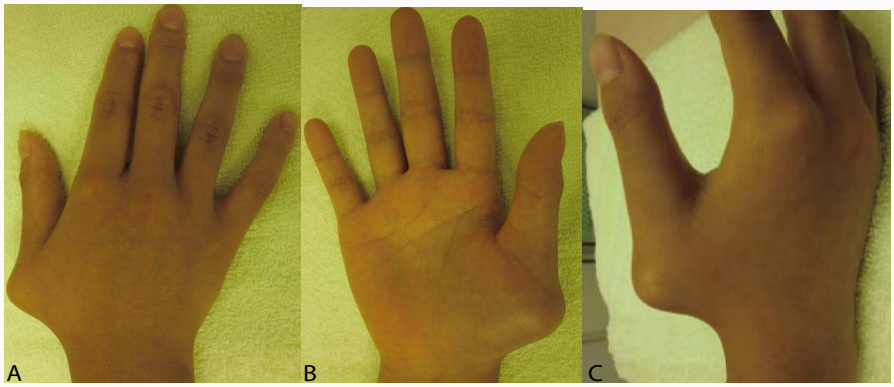

Figure 1: Preoperative photos. **A:** Dorsal view of the right hand. **B:** Volar view **C:** Oblique view.

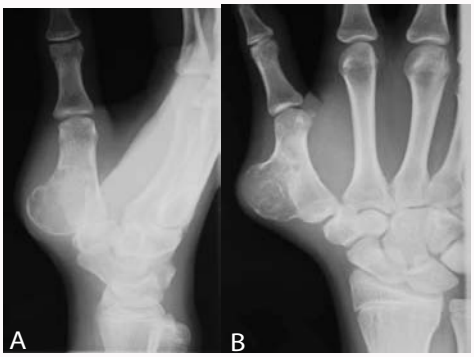

Figure 2: A preoperative plain radiograph. **A) Anteroposterior View:** A well-demarcated, lobulated mass with cartilaginous matrix including some calcification and thin cortical shell is seen on the proximal half of the metacarpal bone. **B) Lateral View:** The mass encroaches on 1/3 of the bone marrow width and a sclerotic bone forming a boundary between the tumor and normal bone marrow. The distal part of the cortex is lifted up by the tumor mass.

partially heterogenous (Figure 3B). STIR showed hyperintense and homogeneous images (Figure 3C).

The patient underwent an excision of the mass under general anesthesia. At surgery, the mass located in the subperiosteal tissue was found to be whitish-gray, soft and fragile. It was adherent to the periosteum of the first metacarpal bone and extended into the bone cortex. The subperiosteal mass was totally excised along with the periosteum. The intracortical lesion was curetted.

Histologically, the lesion consisted of lobulated chondrocytes with encasement, partial calcification and ossification. There was no cellular atypia seen in the chondrocytes (Figure 4). Based on the radiological, intraoperative, and histological findings, a diagnosis of periosteal chondroma was made. The postoperative course was uneventful. There was no recurrence of the lesion at a 6-month follow-up (Figure 5).

Discussion

Periosteal chondroma is a benign cartilaginous tumor that is less common than enchondroma (2%) [1]. It is particularly rare in the hand (27% to 28% of all periosteal chondromas) [5,6]. It is usually a solitary unilateral lesion affecting a single finger. The most common sites of involvement are the proximal and distal phalanges (83.3%), and a single patient had a lesion affecting the 3rd metacarpal bone [7]. There are two forms of chondromas: Enchondromas, which originate within the shafts of tubular bones, and ecchondromas (periosteal chondromas), which usually arise in the periphery of the metaphyseal cortex of long bones [8]. The findings in plain radiographs supported that this case originated from periosteal region.

The age at diagnosis was usually the third, fourth, or fifth decade, consistent with previous studies [9]. However, periosteal chondroma can affect children and elderly individuals. It appears to be more common in men and the highest incidence is in the second decade [2,10]. Pain and swelling are the most common presenting symptoms [2,9,10]. In our case, a 14-year-old female with a 13-year history of an asymptomatic mass on the thumb. To our knowledge, this is the first described case of ecchondroma in a rare location and a younger age population. Care should be taken not to misdiagnose this lesion as a malignant tumor. It can appear similar to a low-grade

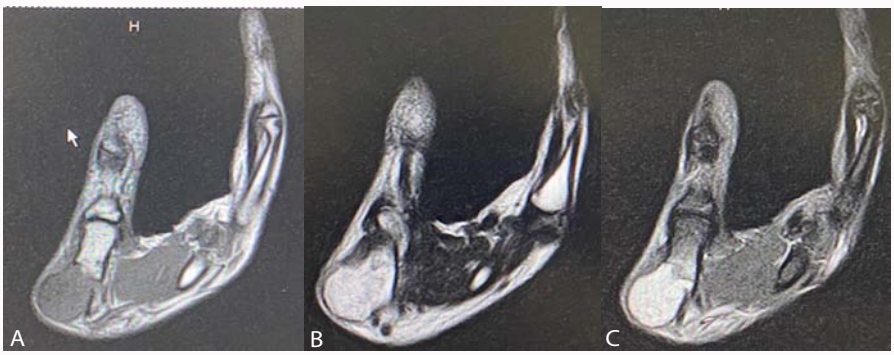

Figure 3: MRI. **A:** Hypointense and homogeneous T1 image. **B:** Hyperintense and partially heterogeneous T2 image. **C:** Hyperintense and homogeneous STIR image.

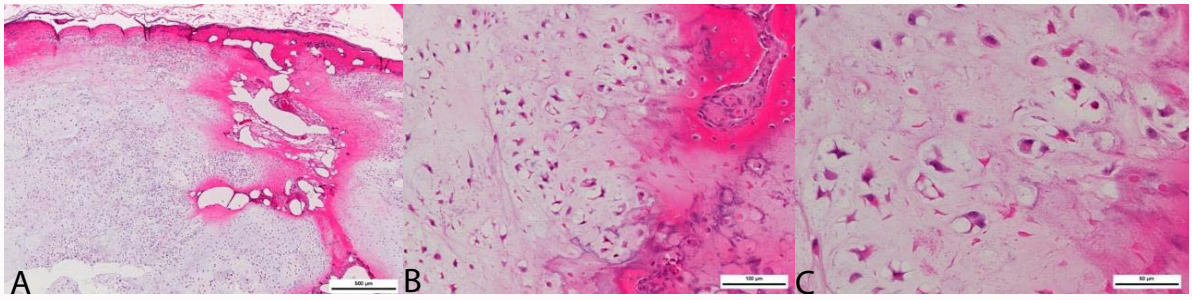

Figure 4: Histopathology. Lesion consisted of lobulated chondrocytes with encasement, partial calcification and ossification. There was no cellular atypia seen in the chondrocytes. Magnification **A:** 500x. **B:** 100x **C:** 50x.

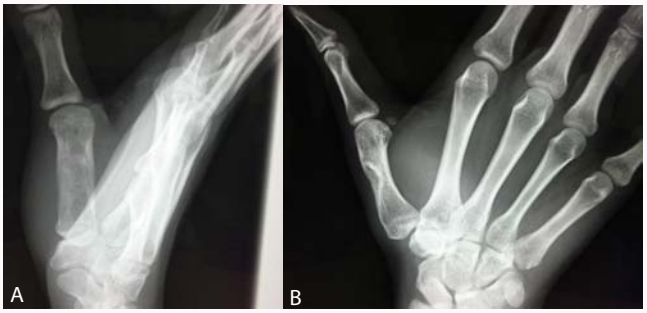

Figure 5: Follow-up X-ray 6 months postoperatively showing no recurrence of the lesion. **A:** Anteroposterior (AP) View of the first metacarpal. **B:** Lateral View of the first metacarpal.

chondrosarcoma, but extension of the tumor into the marrow cavity is not present [5]. The main differential diagnosis is Nora's lesion, also known as benign bizarre parosteal osteochondromatous proliferation [11]. The definitive diagnosis requires a histological examination which shows numerous osteoblasts and large or binucleate chondrocytes (bizarre chondrocytes) in Nora's lesion [12-14].

Muir et al. [15], reported a case of a periosteal osteosarcoma in a 5-year-old, right-handed girl, with a 4-month history of an enlarging mass at the base of the right thumb. Examination confirmed a firm, fixed, mildly tender mass on the dorsal aspect of the first metacarpal. The patient was managed symptomatically but 14 weeks later patient returned complaining that the mass had increased in size and become more symptomatic. Histologic examination revealed a chondroblastic lesion with cellular proliferation and atypia [15].

A similar case reported by Lamichhane et al. [16], a case of a periosteal chondroma in a 22-year-old woman, with pain in and around left hand and a swelling around thenar area for 5 years. She had a history of on-and-off pain for that time, which had worsened over the past 1.5 years. There was no history of trauma or fever and no similar masses in other parts of the body [16].

Ecchondroma can be successfully treated with excisional biopsy. The recurrence rate is relatively low. Many of these lesions cause no symptoms and are discovered incidentally. Often there is a definite history of trauma.

This case presented with almost the same clinical and radiological characteristics as those in the previous reports, except the location and patient age. The long history and lack of clinical impairment during that time made it unlikely to be a malignant form. Surgical excision was successfully performed, and the pathological examination showed a benign form.

References

1. Brien EW, MirraJM, Luck Jr JV. Benign and malignant cartilage tumors of bone and joint: Their anatomic and theoretical basis with an emphasis on radiology, pathology and clinical biology. II. Juxtacortical cartilage tumors. Skeletal Radiol. 1999;28(1):1-20.
2. Bauer TW, Dorfman HD, Latham Jr JT. Periosteal chondroma. A clinicopathologic study of 23 cases. Am J Surg Pathol. 1982;6(7):631-7.
3. Boriani S, Bacchini P, Bertoni F, Campanacci M. Periosteal chondroma. A review of twenty cases. J Bone Joint Surg Am. 1983;65(2):205-12.
4. Shimpuku E, Lee YH, Oka Y. Periosteal chondroma of the proximal phalanx of the thumb. Scand J Plast Reconstr Surg Hand Surg. 2002;36(2):125-7.
5. Takada A, Nishida J, Akasaka T, Shiraishi H, Furumachi K, Tajima K, et al. Juxta cortical chondroma of the hand: treatment by resection of the tumour and the adjacent bone cortex. J Hand Surg Br. 2005;30(4):401-5.
6. Yoshimura Y, Lozej JA, Ishii K, Isobe K, Arai H, Kato H. Multifocal periosteal chondromas in the ring finger of an adolescent boy: Case report. J Hand Surg Am. 2011;36(1):101-5.
7. Yamamoto T, Nagira K, Kurosaka M. Periosteal chondroma presenting as a subcutaneous mass in the thumb. Clin Imaging. 2001;25(6):432-4.
8. Gahhos F, Cuono CB. Periosteal chondroma: Another cause of carpal tunnel syndrome. Ann Plast Surg. 1984;12(3):275-8.
9. Lewis MM, Kenan S, Yabut SM, Norman A, Steiner G. Periosteal chondroma. A report of ten cases and review of the literature. Clin Orthop Relat Res. 1990;256:185-92.
10. Nojima T, Unni KK, McLeod RA, Pritchard DJ. Periosteal chondroma and periosteal chondrosarcoma. Am J Surg Pathol. 1985;9(9):666-77.
11. Santanelli F, Paolini G, Longo B, Laporta R, Pagnoni M. Compression of the digital nerves by a giant periosteal chondroma. J Plast Surg Hand Surg. 2013;47(2):155-7.
12. De Smet L, Lambert I, Sciot R. Bizarre parosteal osteochondromatous proliferation of the hand: Report of two cases. Chir Main. 2001;20(3):247-50.
13. Flint JH, McKay PL. Bizarre parosteal osteochondromatous proliferation and periosteal chondroma- A comparative report and review of the literature. J Hand Surg Am. 2007;32(6):893-8.
14. Nora FE, Dahlin DC, Beabout JW. Bizarre parosteal osteochondromatous proliferations of the hands and feet. Am J Surg Pathol. 1983;7(3):245-50.
15. Muir TM, Lehman TP, Meyer WH. Periosteal osteosarcoma in the hand of a pediatric patient: A case report. J Hand Surg Am. 2008;33(2):266-8.
16. Lamichhane A. Osteochondroma arising from base of 1st metacarpal Bone-A case report. J Inst Med. 2013;35(3):67-9.