

# Idiopathic Chronic Calcific Periarthritis in a Child

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## Abstract

Calcific periarthritis is a calcium deposition disease of the periarticular tissues. Deposits of calcium from calcific periarthritis can be found in the periarticular tissues of the shoulders, hips, elbows, wrists, and knees. This disease is often the manifestation of another primary process, such as end-stage renal disease, collagen vascular disease, and systemic diseases (eg, diabetes mellitus, rheumatoid arthritis), among others. Furthermore, calcific periarthritis has been linked to certain areas of the body because of pathologic stress related to repetitive motions, micro-trauma, and local hypoxia. This type of soft-tissue mass is usually found in older men and women. In addition, its incidence, calcium deposits related to calcific periarthritis, and soft-tissue masses in general, are rare in children.

Here we present the first report of idiopathic chronic calcific periarthritis in a child. The diagnosis was suspected on the basis of clinical and radiographic appearance and despite the rarity of the disease in children. The patient underwent surgical treatment and was free of local recurrence. The cause of this case was never determined.

Calcific periarthritis is the manifestation of unusual calcium deposits, specifically in the periarticular tissue (tendons).<sup>1</sup> These deposits usually consist of calcium hydroxyapatite but sometimes can be of other calcium phosphate crystals, such as octacalcium phosphate and tricalcium phosphate.<sup>1,2</sup> They are most often found in the periarticular tissue of the shoulders, hips, elbows, wrists, and knees.<sup>1</sup> These areas of stress and overall range of motion play a role in the etiology and incidence of the disease.<sup>3</sup> Calcific periarthritis and calcium deposition disease are not uncommon, but their incidence outside the middle-aged population is rare.<sup>1</sup> Calcific periarthritis most often occurs in the setting of end-stage renal disease, collagen vascular disease, vitamin D intoxication, and tumoral

calcinosis.<sup>1</sup> However, though calcium deposits have been known to develop idiopathically, calcific periarthritis is thought to develop secondary to the previously mentioned diseases or in areas of relative pathologic stress<sup>3</sup> that experience tissue degeneration, avascularity, and abnormal pressure.<sup>4</sup> Similarly, these areas may experience local hypoxia, which causes fibrocartilage formation, leading to calcium deposition.<sup>5</sup> Lee and colleagues<sup>6</sup> inferred that microtrauma, such as that resulting from repetitive motion or pathologic stress, can cause tissue degeneration and avascularity that lead to calcific periarthritis. The disease is most likely discovered after patients report of pain, discomfort, inflammation, and swelling,<sup>1</sup> and after radiographics are obtained. The usual presenting symptoms of calcific periarthritis and other arthropathies associated with the basic calcium phosphate hydroxyapatite crystal (BCP) are warmth and localized pain.<sup>2</sup> Calcific periarthritis is easily diagnosed on review of a radiograph, as it is characterized by homogeneous, roughly ovoid, well- or ill-defined, amorphous densities without trabeculation near a commonly used joint.<sup>1</sup> This condition is extremely rare in children.

Here we present the first report of idiopathic chronic calcific periarthritis in a child. The patient's parents provided written informed consent for print and electronic publication of this case report.

## CASE REPORT

The patient was an 11-year-old right-hand-dominant girl who noticed a mass in the region of her posterior left elbow while taking a shower. She said that the mass appeared suddenly and that she had never noticed any other masses. She and her parents waited a few days to see if the mass would resolve on its own, and then sought medical attention in a local emergency department where a radiograph was obtained. She was referred to her primary care physician and then to an orthopedic oncologist. Past medical history was significant for scoliosis, which was being followed clinically (brace or surgical treatment was not required). The patient was not taking any medications and family history was noncontributory.

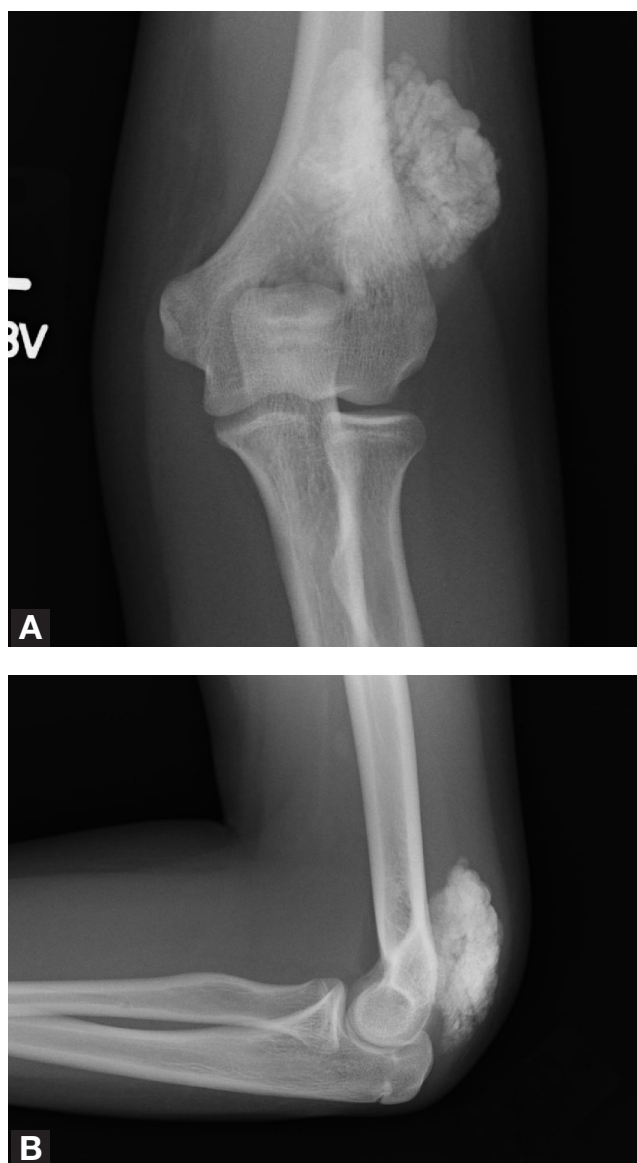
On physical examination, the patient was 5 feet 5 inches tall and weighed 145 pounds. She had full, unrestricted, painless range of motion of the left shoulder, elbow, wrist, and hand. A well-defined soft-tissue mass over the posterior aspect of the distal arm was noted. The mass was freely mobile and not adhering to underlying tissue. It was felt to be deep to fascia and did not transilluminate. There were no cutaneous changes and no adenopathy.

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**Figure 1.** Anteroposterior (A) and lateral (B) radiographs show a 4×4-cm, well-defined, flocculent-appearing mass with characteristic appearance of soft-tissue calcifications. There was no periosteal new bone or evidence of osseous involvement.

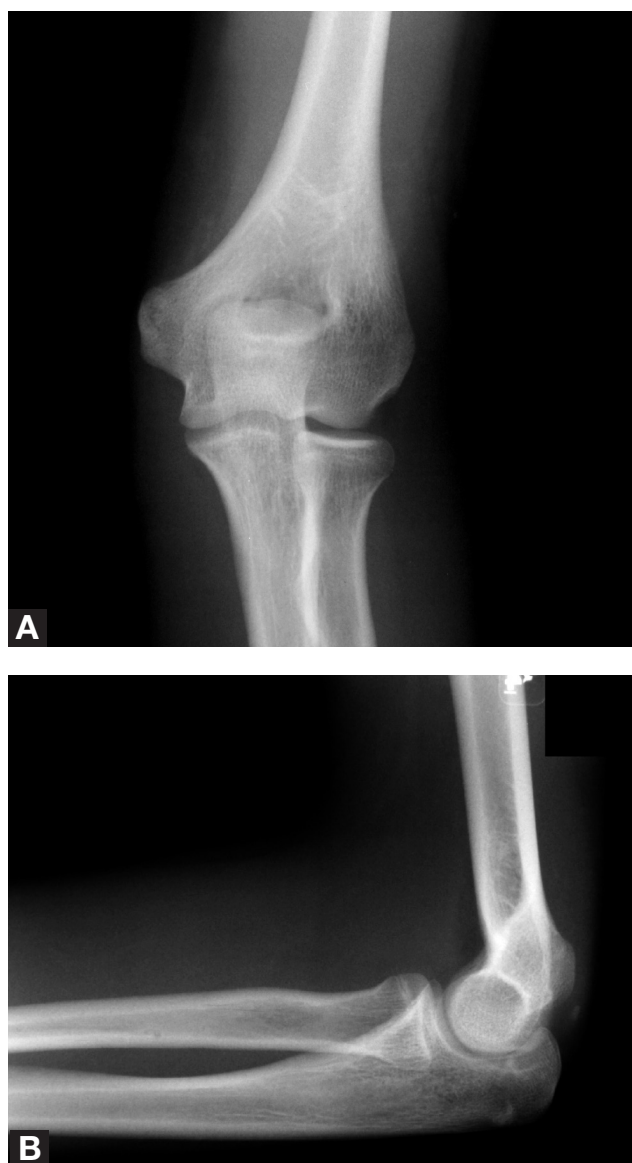
Neurologic, motor, sensory, and neurologic examinations were unremarkable.

Anteroposterior lateral radiographs showed a well-defined ossified soft-tissue mass in the posterior aspect of the distal arm. The mass was more mature centrally than peripherally (Figures 1A, 1B).

An open biopsy was performed. The pathology confirmed presence of calcific material consistent with calcium hydroxyapatite. At time of surgery, the mass was not adhering to bone or tendon. It was completely excised (Figures 2A, 2B).

## DISCUSSION

Calcific periarthritis resembles other diseases involving calcium deposits. It may resemble enchondronal ossifica-



**Figure 2.** Postoperative anteroposterior (A) and lateral (B) radiographs show complete removal of mass.

tion, as both emerge in the living tissue of tendons and ligaments, but they can be differentiated, as enchondronal ossification does not display the avascularity that is important for the calcium deposits of calcific periarthritis.<sup>7</sup> On review of radiographs, calcific periarthritis may resemble heterotopic ossification, but the latter is ruled out by lack of trabeculation, or formation of spicules or connective tissue strands in the calcium deposits.<sup>8</sup> Specifically in the elbow, the disease can be distinguished from myositis ossificans because the calcium deposits of calcific periarthritis exhibit amorphous opacity but lack trabeculation, whereas the opposite is found in the calcium deposits of myositis ossificans.<sup>1</sup> In our patient's case, there was a calcium deposit near the left elbow. Although the elbow is a site of stress, and thus a plausible site for calcium deposits and calcific periarthritis, the appearance of such a deposit in a girl so young is surprising, not only because of loca-

tion and age but also because of history. This patient had not had any of the diseases that have calcific periarthritis as a secondary effect. Furthermore, she had not had any of the systemic diseases that are associated with calcific periarthritis—such as thyroidism, rheumatoid arthritis, and diabetes mellitus.<sup>9</sup> Finally, without a history of pathologic stress involving the elbow, this patient's case must be idiopathically diagnosed.

Although some authors have reported calcific periarthritis in younger people, patient age, as reported by Lee and colleagues,<sup>6</sup> is a mean of 45 years<sup>10</sup> or ranges from 40 years to 70 years,<sup>11</sup> and the disease is generally thought to affect the sexes equally.<sup>12</sup> Our patient is the second youngest reported to have the disease. The youngest was a 7-year-old boy, whose case was reported by Mercer and colleagues.<sup>13</sup> That boy had acute calcific periarthritis in the thenar eminence and first dorsal web space of the right hand resulting from diaphyseal aklasia and multiple sustained traumas to the hand—unlike the pathologic stress and microtrauma discussed earlier. However, his case differs from our patient's in that he had acute symptoms of pain, tenderness, local edema, and mild fever<sup>5</sup> and needed only rest and analgesics for the self-limiting calcifications to dissipate,<sup>13</sup> whereas our patient had chronic symptoms of mild pain and tenderness<sup>5</sup> and required surgical intervention. Although a pathologic cause was not apparent in our patient's his-

tory, the radiographic evidence was sound in diagnosing idiopathic calcific periarthritis of the elbow.

### AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

### REFERENCES

1. Hayes CW, Conway WF. Calcium hydroxyapatite deposition disease. *Radiographics*. 1990;10(6):1031-1048.
2. Gupta SJ. Crystal induced arthritis: an overview. *J Indian Rheumatol Assoc*. 2002;10(1):5-13.
3. Gondos B. Observations on periarthritis calcarea. *AJR Am J Roentgenol*. 1957;77(1):93-108.
4. Codman EA. *The Shoulder*. Boston, MA: Todd; 1934.
5. Kuroda H, Wada Y, Nishiguchi K, et al. A case of probable hydroxyapatite deposition disease (HADD) of the hip. *Magn Reson Med Sci*. 2004;3(3):141-144.
6. Lee KB, Song KJ, Kwak HS, Lee SY. Acute calcific periarthritis of proximal interphalangeal joint in a professional golfer's hand. *J Korean Med Sci*. 2004;19(6):904-906.
7. Uthoff HK, Sarkar K, Maynard JA. Calcifying tendinitis: a new concept of its pathogenesis. *Clin Orthop*. 1976;(118):164-168.
8. Moore DS, Cho G. Heterotopic ossification imaging. <http://emedicine.medscape.com/article/390416-overview>. Updated March 19, 2010. Accessed August 27, 2011.
9. Kim KC, Kim JC, Jeong JY, Jeon OJ, Joo YM, Lee SJ. The relationship between shoulder periarthritis and NIDDM. *J Korean Diabet Assoc*. 1991;15(2):263-265.
10. Carroll RE, Sinton W, Garcia A. Acute calcium deposits in the hand. *JAMA*. 1955;157(5):422-426.
11. Yosipovitch G, Yosipovitch Z. Acute calcific periarthritis of the hand and elbows in women. A study and review of the literature. *J Rheumatol*. 1993;20(9):1533-1538.
12. Currey HL. Pyrophosphate arthropathy and calcific periarthritis. *Clin Orthop*. 1970;(71):70-80.
13. Mercer NS, Newman JH, Watt I. Acute calcific periarthritis in a child. *J Hand Surg Br*. 1984;9(3):351-352.

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