

Two cases of calcium pyrophosphate deposition disease (CPPD) presented with spondylodiscitis

Tuğba İzci Duran , Metin Özgen 

Abstract

Calcium pyrophosphate deposition disease (CPPD) is a crystal arthropathy, and may present with various clinical manifestations such as asymptomatic CPPD, osteoarthritis with CPPD, acute CPPD crystal arthritis (formerly pseudogout), and chronic CPPD crystal inflammatory arthritis. It is known that aging, trauma and osteoarthritis are major risk factors for CPPD. Acute CPP arthritis may occur as monoarticular or oligoarticular and usually involves large peripheral joints such as the knees, wrists and ankles. CPPD is characterized by sudden onset of severe pain, swelling and periarticular erythema, and systemic symptoms such as fever, chills, and weakness may occur. On the other hand, axial CPPD has been reported rarely and most cases appear with symptoms related to a mass effect such as foramen magnum syndrome, spinal stenosis, radiculopathy, myelopathy, synovial cyst or cauda equina syndrome. In addition, there are fewer reported cases of spinal CPPD that cause neck and back pain. This clinical condition should be considered in the differential diagnosis of acute neck and back pain.

Keywords: Calcium pyrophosphate deposition disease, calcium pyrophosphate dihydrate deposition, pseudogout, spondylodiscitis

Introduction

According to the European League Against Rheumatism, calcium pyrophosphate deposition disease (CPPD) is a crystal arthropathy and may present with various clinical manifestations such as asymptomatic CPPD, osteoarthritis with CPPD, acute CPPD crystal arthritis (formerly pseudogout), and chronic CPPD crystal inflammatory arthritis (1). Aging, trauma, and osteoarthritis are known as major risk factors for CPPD. However, if CPPD develops in individuals younger than 45 years, metabolic diseases such as hyperparathyroidism, hemochromatosis, and hypomagnesemia should be considered (1, 2). Acute CPP arthritis can occur as monoarticular or oligoarticular and usually involves large peripheral joints such as the knees, wrists, and ankles (1, 2). CPPD is characterized by the sudden onset of severe pain, swelling, and periarticular erythema, and systemic symptoms such as fever, chills, and weakness may occur. Such inflammatory attacks can be triggered by medical or surgical interventions, and the differential diagnosis between septic arthritis and acute CPPD may not always be easy (3).

Axial CPPD has rarely been reported, and most cases appear with symptoms related to a mass effect such as foramen magnum syndrome, spinal stenosis, radiculopathy, myelopathy, synovial cyst, or cauda equina syndrome (2). In addition, there are fewer reported cases of spinal CPPD that cause neck and back pain (4-11). Two cases of acute CPP spondylodiscitis associated with severe cervical and thoracic pain are reported in this paper.

Case Presentation

Case 1

A 75-year-old female was previously diagnosed with diabetes mellitus and hypertension. She had been evaluated in various clinics for 3 months and was admitted to our clinic with systemic complaints such as fatigue and generalized joint pain. She also reported neck pain in the system query. On physical examination, arthritis was not observed, and there was minimal limitation in neck movements that was associated with advanced age. No further examination was performed for neck pain. The laboratory results were as follows: creatinine: 0.70 mg/dL, calcium: 9.6 mg/dL, albumin: 3.91 g/dL, white blood cell count: $6.36 \times 10^3/\mu\text{L}$, hemoglobin: 10.00 g/dL, hematocrit: 32.2%, platelet: $423 \times 10^3/\mu\text{L}$, C-reactive protein (CRP): 101 mg/L, eryth-

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Cite this article as: İzci Duran T., Özgen M. Two cases of calcium pyrophosphate deposition disease (CPPD) presented with spondylodiscitis. Eur J Rheumatol 2020; 7(2): 84-7.

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Submitted: October 2, 2019

Accepted: December 11, 2019

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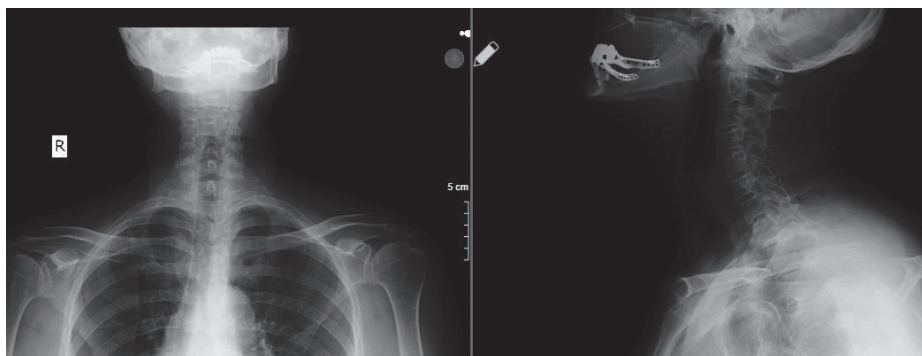


Figure 1. Degeneration of the cervical vertebral corpus and the lower vertebral facet joints.

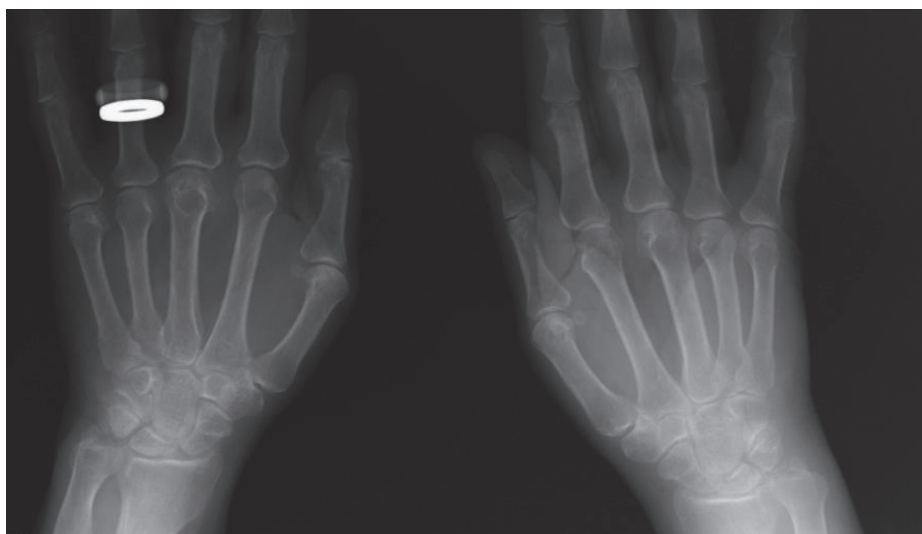


Figure 2. Calcification around carpal bones.

rocyte sedimentation rate (ESR): 116 mm/h, rheumatoid factor (RF): negative, and anti-cyclic citrulline peptide (anti-CCP) antibody: negative. The patient was hospitalized due to ESR and CRP elevation. On the 3rd day of hospitalization, swelling, temperature increase, and tenderness developed in wrists; additionally, neck pain increased and significant restriction in cervical movements occurred. Degeneration was observed in the cervical vertebral corpus and the lower vertebral facet joints in cervical vertebra radiography (Figure 1). Calcification was observed around the carpal bones in wrist radiography (Figure 2). In comparative knee joint radiography, there were significant marginal osteophytes in both the knee joints especially in the medial region. Narrowing of the medial joint space, increased subchondral

sclerosis in the tibial plateaus, and calcification of the bilateral meniscus were also noted (Figure 3).

The patient was diagnosed as pseudogout due to calcification in radiographs. Colchicine 3×0.5 mg tablets, nimesulide 1×100 mg tablets, and prednisolone 1×5 mg tablets were started. At follow-up, the patient's CRP decreased to 8.22 mg/L and ESR decreased to 20 mm/h.

Initially, spondylodiscitis was not considered due to the fact that neck pain was detected in the system query and was not among the complaints at the time of admission. However, the significant increase in cervical joint movement limitation after hospitalization and immediate improvement in cervical joint movement with treatment suggested that the patient had a spondylodiscitis attack. Since cervical magnetic resonance imaging (MRI) was performed after the treatment, when the patient was asymptomatic and the cervical movements were within normal limits, no signs of acute spondylodiscitis were detected. Cervical vertebral MRI was performed during the follow-up, and compatible appearance of spondylodiscitis sequelae at C3-C4 and C4-C5 disc levels was detected.

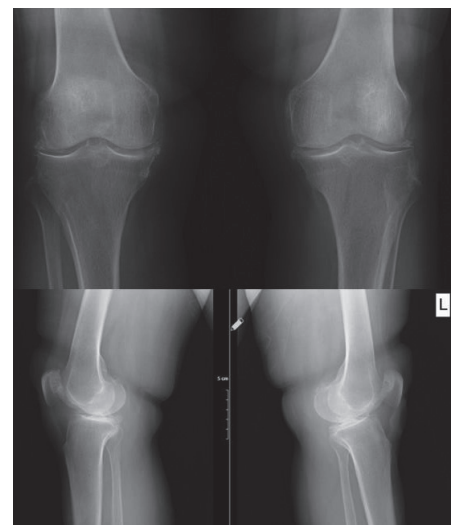


Figure 3. Significant marginal osteophytes in both knee joints especially in the medial region, narrowing of the medial joint space, increased subchondral sclerosis in the tibial plateaus, calcification in the bilateral meniscus, and degeneration of the patellofemoral joint.



Figure 4. Flattened cervical lordosis, loss of signal secondary to the degeneration of cervical intervertebral discs, and mild contrast enhancement (spondylodiscitis) of C5-C6 vertebral corpus.

Case 2

A 61-year-old female was admitted to another center with complaints of fever, fatigue, and dorsal neck pain. Sacroiliac MRI was performed, and no sacroiliitis was detected by the clinic. Lumbar MRI showed loss of signal secondary to degeneration of the lumbar intervertebral discs, right paracentral protrusion at L1-5 levels, and compression of the dural sac. Thoracic MRI showed signal changes compatible with hemangioma in T8 vertebra corpus and loss of signal secondary to the degeneration of intervertebral discs. Flattened cervical lordosis, loss of signal secondary to degeneration of cervical intervertebral discs, and mild contrast enhancement (spondylodiscitis) of C5-C6 vertebra corpus and C5-C6 intervertebral disc were detected in cervical MRI (Figure 4). The patient

Main Points

- CPPD may have axial involvement and is presented with spondylodiscitis.
- CPPD may increase acute phase reactants.
- In the treatment of CPPD, a low-dose steroid may be required in addition.

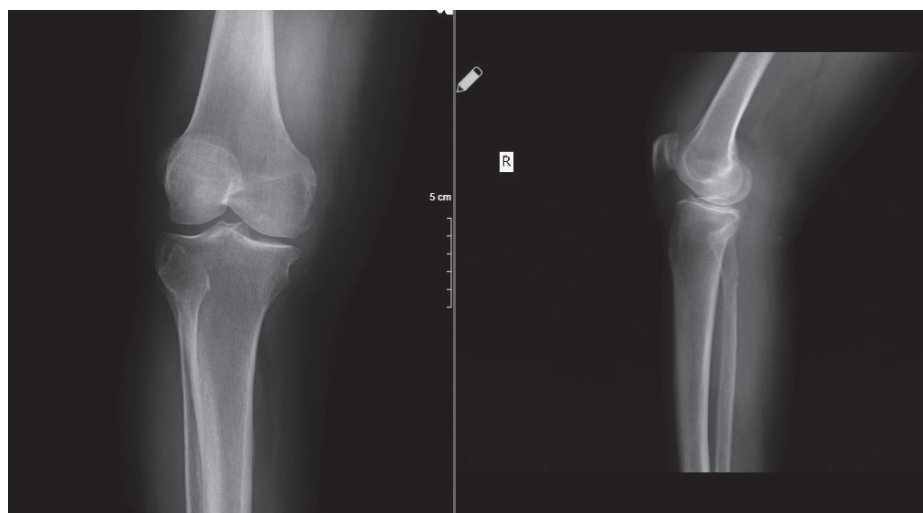


Figure 5. Radiography of the right knee: Increase of subchondral sclerosis and calcification of meniscus.

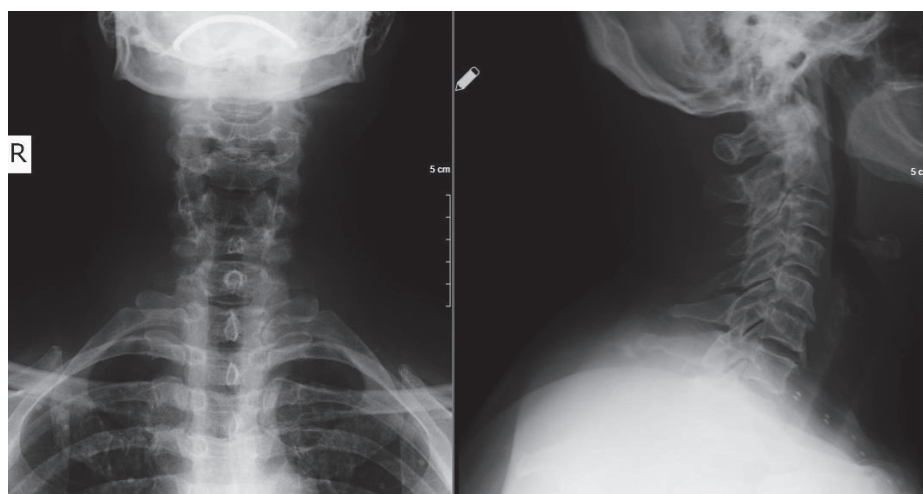


Figure 6. Degeneration of the cervical vertebral corpus and the lower vertebral facet joints.

was discharged with antibiotherapy due to spondylodiscitis.

The patient, who had complaints of increased neck pain and swelling in the right knee after discharge, was referred to the rheumatology clinic due to increase in acute phase reactants despite antibiotherapy. Laboratory findings were as follows: CRP: 125 mg/L, erythrocyte sedimentation rate (ESR): 95 mm/h, RF: negative, anti-CCP antibody: negative, and anti-nuclear antibody: negative. There was increased subchondral sclerosis and meniscus calcification in the right knee radiography (Figure 5). Cervical vertebra radiography revealed degeneration in the cervical vertebral corpus and the facet joints of the lower vertebra (Figure 6).

The patient was diagnosed with pseudogout and was prescribed colchicine 2x0.5 mg tablets, prednisolone 2x5 mg tablets, and non-steroidal anti-inflammatory drug (NSAID) 1x1 tablets. Eight days later, at follow-up, the

following results were found: creatinine: 0.56 mg/dL, alkaline phosphatase: 47 units per liter (U/L), gamma glutamyltransferase: 14 U/L, AST: 13 U/L, ALT: 17 U/L, CRP: 7.2 mg/L, and ESR: 34 mm/h. Prednisolone treatment was reduced to 1x1 tablets, CRP was <3 mg/L, and ESR was 20 mm/h at 1-month follow-up.

Literature Review

Articular chondrocalcinosis in radiography has been known for more than 40 years. In 1962, McCarty et al. (12) identified crystals in the synovial fluid of patients with CPPD and called the syndrome associated with CPPD “pseudogout.”

The accumulation of calcium pyrophosphate dihydrate crystals in the axial skeleton fibrocartilage is a common finding in patients undergoing recurrent spine surgery. However, the symptomatic involvement of the spine with calcium pyrophosphate crystals is rare. Spinal CPPD is generally reported to occur as a space-occupy-

ing lesion with chronic symptoms (2, 13). However, some cases of spinal CPPD may occur as an acute pain, whereas others may be accompanied by systemic symptoms. There may be cases with unclear spinal involvement symptoms and prominent systemic symptoms as presented in the first case. In a previous study, 152 patients with CPPD were retrospectively investigated and 37 patients were diagnosed with spinal CPPD. Only 6 of the 37 patients had spondylodiscitis (14).

Axial CPPD may mimic septic spondylodiscitis or aseptic abscess. The diagnosis of axial CPPD should be considered in the case of acute inflammatory back pain in the elderly, especially if there is a history of peripheral joint CPPD. Even if MRI shows findings similar to infectious spondylodiscitis with epidural abscess, it is beneficial to rule out the axial diagnosis of CPPD. It has been reported that axial CPPD may mimic erosive axial osteoarthritis with multi-level erosive and destructive lesions within the spinal end plates, bone sclerosis, subchondral cysts, erosions, joint collapse, osteophyte formation, vertebral ankyloses, or degenerative spondylolisthesis. In the second case, spondylodiscitis was evaluated as infectious by the previous clinic, and long-term antibiotherapy was given. Even when the patient was referred to the rheumatology clinic due to the development of arthritis in the knee joint, previous antibiotherapy was continued. However, the patient's spondylodiscitis was associated with CPPD and regressed with colchicine and prednisolone treatment. It should be kept in mind that CPPD may have axial involvement especially in elderly patients who do not respond to antibiotic treatment or who have recurrent spondylodiscitis.

We presented cases of pseudogout causing spondylodiscitis due to crystal-induced acute inflammation in the cervical spine. This clinical condition should be considered in the differential diagnosis of acute low back and neck pain. When diagnosed with acute CPPD, patients show a good therapeutic response to NSAID, colchicine, or glucocorticoids and unnecessary antibiotic use is avoided (2).

Conclusion

Axial involvement of CPPD should be considered in patients diagnosed with spondylodiscitis presenting with spinal pain. On the other hand, questioning axial pain in newly diagnosed CPPD patients should be considered. In addition, the combination of colchicine and low-dose steroids appears to be effective in the axial involvement of CPPD in these two cases.

Informed Consent: Written informed consent was obtained from the patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - T.İ.D., M.Ö.; Design - T.İ.D., M.Ö.; Supervision - T.İ.D., M.Ö.; Resources - T.İ.D., M.Ö.; Materials - M.Ö.; Data Collection and/or Processing - T.İ.D.; Analysis and/or Interpretation - T.İ.D., M.Ö.; Literature Search - T.İ.D.; Writing Manuscript - T.İ.D.; Critical Review - M.Ö.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

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