Upper limb pyrophosphate tenosynovitis outside the carpal tunnel

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SUMMARY Three cases of calcium pyrophosphate dihydrate (CPPD) crystal deposits in tendon sheaths outside the carpal tunnel are reported. Crystals were shown by x ray diffraction analysis in one case and by compensated light microscopy in the other two. Surgical excision of the tendon synovial sheath had to be done in two cases (one case with CPPD crystal deposits).

Extra-articular deposition of calcium pyrophosphate dihydrate (CPPD) crystals has been described in rare cases, especially in the ligamentum flavum1-4 and in various kinds of tendons: triceps,5 flexor digitorum,6 and Achilles tendon.6 7 It has also been reported in bursitis,5 in subcutaneous tissue,8-10 and even in the dura mater.11 Presumed similar deposits have been radiologically reported in patients otherwise known for CPPD crystal deposition disease —for example, in transverse ligament of the second cervical vertebra12 and in flexor digitorum.13 The association of carpal tunnel syndrome with articular chondrocalcinosis has been classically reported14-17; deposits of CPPD crystals have been found in the volar carpal ligament as well as in the tendon sheaths.18 19

We report the finding of CPPD crystals in the synovial fluid from tendon sheaths outside the carpal tunnel.

Case report

CASE 1
A 72 year old woman had been operated on for a bilateral carpal tunnel syndrome 10 years ago. She had been suffering from pain in the left knee for about five years and from pain in both shoulders for three years. In addition, she had had painful swelling of the ventral part of the fifth left finger for about 10 months. Clinically, the tendon sheath was diffusely swollen and tender and motion of the finger was restricted (Fig. 1). The left knee was swollen and tender and the shoulders were limited and tender. Radiographs showed chondrocalcinosis of both wrists, both knees, and a destructive arthropathy of the left shoulder. Degenerative

Fig. 1 Case 1. Diffuse swelling of the tendon sheath of the fifth finger.
changes of the first carpometacarpal joints were also
found in the left hand.

Examination of the synovial fluid of the left knee
showed 0.2x10⁹ leucocytes/l with rare intracellular
positive birefringent crystals. Red S alizarin staining
was negative. Synovial fluid was
positive
birefringent crystals. Red S alizarin staining
tenosynovial cavity of the finger (25 January 1988); it was gelatinous and contained rare white deposits
2-3 mm in diameter. X Ray powder diffraction
analyses of this material showed CPPD crystals. Examination of some fragments by transmitted
electron microscopy and by x ray electron diffraction
did not show CPPD crystals.

Discussion

The common feature of these three cases is a hand
tenosynovitis whose exudated synovial fluid con-
tained CPPD crystals which were disclosed by x ray
diffraction in one case and by the presence of rod-
like positive birefringent crystals in the others. In
only one case were CPPD crystal deposits found in
the neighbouring synovium and this patient
had presented with radiological signs of chondro-
calcinosis in both knee and wrist joints. In the other
two cases chondrocalcinosis was shown by x ray
examination in only one of them.

These cases show that CPPD crystal deposits in
the hand in extra-articular locations induce not only
a carpal tunnel syndrome but also tenosynovitis even in the absence of radiological signs of chondro-
calcinosis elsewhere in the joints. Synovial fluid
examination seems to be more simple and sensitive
than a synovial biopsy, particularly as histological
changes are not equally spread. It is uncertain
whether the primary CPPD crystal deposits involve
the tenosynovial membrane or the tendon itself.

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