Calcium Pyrophosphate Deposition Disease (CPPD) (Formerly Pseudogout)

Pseudogout is the deposition of calcium pyrophosphate crystals in joints, which are positively birefringent. Patients complain of arthritis, typically in the knee, and are usually above 50 years of age.



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Pathophysiology

Calcium Pyrophosphate Crystals
Calcium-cow shooting Pyro-phosphate-P Crystals
Calcium pyrophosphate deposition disease (CPPD) is caused by the deposition of calcium pyrophosphate dihydrate crystals in articular cartilage and synovial fluid, which induces an inflammatory response similar to gout.

> 50 Years Old
Greater Than old 50-cent
This disease is more common with age and is typically seen in individuals above the age of 50 years old.

Acute Inflammation of Large Joints (Classically the Knee)
Acute-sign Knee In-flames
CPPD commonly presents as acute or chronic arthritis involving large joints, most classically the knee. Other joints such as the wrist, shoulder, and ankle may also be affected.

Risk Factors

Prior Joint Injury
Joint Injured
A previous fracture, meniscal tear, or other articular trauma that alters cartilage integrity and promotes calcium pyrophosphate crystal deposition.

Osteoarthritis
Ostrich-King-Arthur
A chronic degenerative joint condition that disrupts cartilage metabolism and increases local cartilage matrix turnover, which facilitates calcium pyrophosphate crystal formation.

Metabolic Conditions
Metal-ball
Systemic disorders such as hemochromatosis, hyperparathyroidism, hypomagnesemia, hypophosphatasia, or hypercalcemia that change mineral homeostasis and raise the likelihood of calcium pyrophosphate crystal deposition.

Diagnosis

Positively Birefringent
Positive Bi-refrigerators
Under polarized light microscopy, CPPD crystals are positively birefringent, appearing blue when parallel to the axis of the compensator, opposite to gout's negatively birefringent urate crystals.

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Rhomboid-shaped Crystals

Rhomboid-shaped Crystals

CPPD commonly shows calcium pyrophosphate crystals that appear rhomboid-shaped under polarized light. These crystals typically display weak positive birefringence, which helps clinicians distinguish CPPD from gout.

Chondrocalcinosis (On X-ray)

Condiment-calcium-cow

Radiographic imaging often reveals chondrocalcinosis, a linear calcification of articular cartilage or menisci, which is diagnostic of calcium pyrophosphate crystal deposition.

Treatment

NSAIDs

N-sad

Nonsteroidal anti-inflammatory drugs (NSAIDs) are the first-line treatment for acute CPPD flares, helping reduce pain and inflammation.

Colchicine

Cult-of-cheese

Colchicine may be used for the treatment of acute attacks or prophylaxis, as it inhibits neutrophil chemotaxis and reduces inflammation caused by crystal deposition.

Steroids

Steroid-stairs

Intra-articular or systemic corticosteroids are indicated for patients unable to tolerate NSAIDs or colchicine, or for those with severe inflammation unresponsive to first-line agents.

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