

Pancarpal Synovial and Tenosynovial Chondromatosis in a 65-Year-Old Man: A Highly Unusual Presentation of a Common Condition

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Abstract

Synovial chondromatosis is a rare, benign, metaplastic condition in which synovial tissue becomes hyperplastic, and foci of cartilaginous metaplasia develop in the synovial membranes of joints, bursae, or tendon sheaths. Involvement is most commonly monoarticular. The large joints are most commonly affected, with the knee accounting for more than half of all cases. There are isolated reports of synovial chondromatosis occurring in the small joints of the wrist and hand. However, it is very uncommon for the disease to involve multiple different synovial structures.

We report the case of a middle-aged man with pancarpal synovial chondromatosis with involvement of numerous bony, articular, and tenosynovial structures within the hand and wrist.

Case Report

A 65-year-old man presented with a 20-year history of intermittent right wrist pain that flared up with wrist hyperextension. During the year before presentation, the pain progressed moderately, and he began to notice decreasing range of motion (ROM) throughout the wrist and hand. He also noted a mass that was increasing in size about the radiosaphoid area. He had experienced intermittent numbness and paresthesias in the index and long finger during the previous year. Other than for a history of total hip arthroplasty for degenerative arthrosis, his medical history was unremarkable.

Our physical examination revealed decreased wrist ROM with 10° to 15° of extension, 10° to 15° of flexion, and mildly decreased ulnar and radial deviation relative to the contralateral side. Pronation and supination were identical between the affected side and the contralateral side. Multiple masses were visualized and palpated throughout the hand and

carpi both on the volar and dorsal surfaces from the level of the midpalmar crease distally and 1 cm proximal to the wrist flexion crease proximally. The patient had full ROM about the metacarpophalangeal joints, proximal interphalangeal joints, and distal interphalangeal joints. Two-point discrimination was less than 6 mm on the tips of all 5 digits. There was no epitrochlear or axillary lymphadenopathy. Plain radiographs (Figure 1) and magnetic resonance imaging (Figures 2A-D) showed multiple calcified masses throughout the wrist and hand consistent with synovial chondromatosis. Significant bony erosions throughout the carpal bones/joints and involvement of the flexor and extensor tendons were noted (Figures 1, 2A-D).

Given the clinical symptoms and imaging, the patient was taken to the operating room, where we performed synovectomy of the right radiocarpal, radioulnar, intercarpal, and carpometacarpal joints (with excision of multiple osteochondral masses) through separate dorsal and volar approaches. We found multiple osteochondral loose bodies within the fourth through sixth extensor compartments; the first through third compartments were not involved. Numerous loose bodies were also noted within the radiocarpal, ulnocarpal, distal radioulnar, intercarpal, and carpometacarpal joints (Figures 3A-C). There were numerous loose bodies within the flexor tendon sheaths from the carpal tunnel to the proximal interphalangeal joints.

Histopathology showed synovial chondromatosis (Figures 4A, 4B). By 6 weeks after surgery, the patient had no pain. He entered a formal hand therapy program to regain strength and ROM. At 1-year follow-up, he was free of symptoms.

The patient provided written informed consent for print and electronic publication of this case report.

Discussion

Synovial chondromatosis typically occurs as a monoarticular problem in the knee, hip, elbow, ankle, and shoulder.^{1,2} Most orthopedic surgeons and pathologists are familiar with and can easily recognize classic monoarticular synovial chon-

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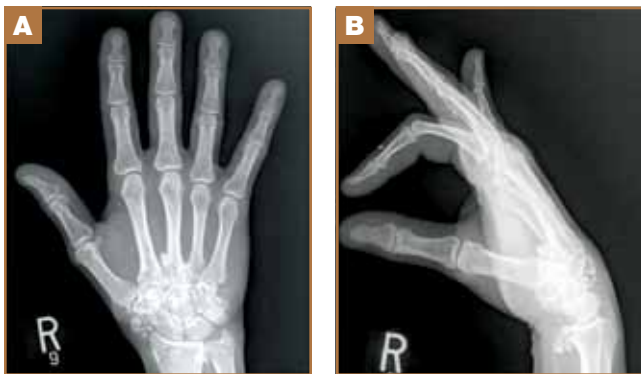


Figure 1. Anteroposterior (A) and lateral (B) radiographs of hand show multiple calcified nodules with extensive wrist and carpal involvement.



Figure 2. Coronal (A, B) and axial (C, D) T₁-weighted and T₂-weighted magnetic resonance imaging of wrist shows multiple nodular masses within wrist and midcarpals. Bony erosions adjacent to nodules appear throughout.

dromatosis presenting as a painful problem affecting a large joint with a typical radiographic appearance. Tenosynovial or bursal chondromatosis is considerably less common and can present a diagnostic challenge, especially when located in the distal extremities. There have been various case reports of this condition occurring in the hand and wrist (Table), but pancarpal involvement appears exceedingly rare.²⁸⁻³⁰ Therefore, our patient's case represents the most uncommon of all possible scenarios—a mixture of both synovial and tenosynovial chondromatosis in an atypical location with polyarticular involvement and bony erosions adjacent to the osteochondral nodules.

In 2003, Fetsch and colleagues³¹ presented a series of 37 cases of tenosynovial (extra-articular) chondromatosis with a predilection for the hands and feet. The authors described this as an entity histologically similar or identical to typical synovial chondromatosis but with a different clinical behav-

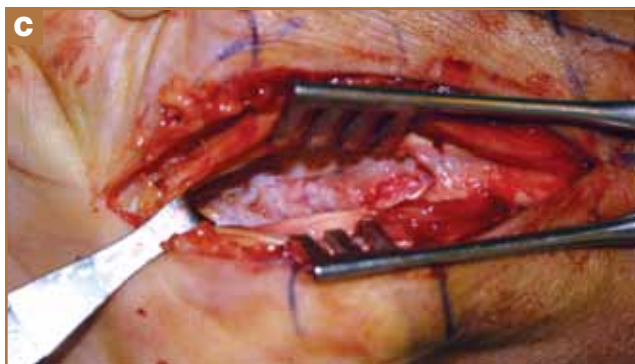


Figure 3. Excision of dorsal (A) and volar (B) radiocarpal masses arising from both synovial and tenosynovial structures. Note tenosynovial nodule in carpal tunnel (C), likely cause of patient's median nerve symptoms.

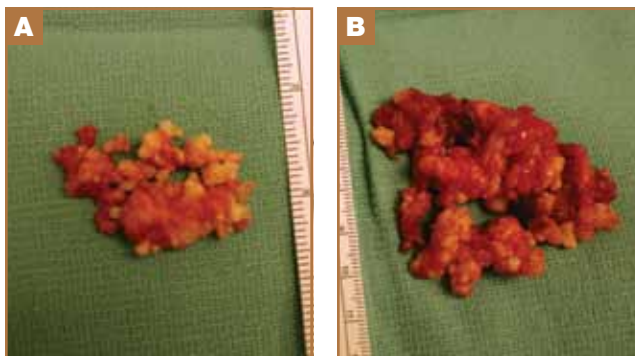


Figure 4. Excised masses from dorsal (A) and volar (B) incisions. Glistening, white multinodular lesions often in clusters are typical of synovial chondrometaplasia.

Table. Case Reports and Articles on Synovial Chondromatosis in Hand, Wrist, Flexor, and Extensor Tendons

Location	Total No. of Cases
Distal radioulnar joint ³⁻¹²	10
Radiocarpal joint ¹³⁻¹⁵	3
Pisotriquetral joint ^{1,6,16-18}	5
Metacarpophalangeal joint ¹⁹⁻²³	5
Flexor tendon sheath, long finger ²⁴⁻²⁶	3
Flexor tendon sheath, long finger ^{27,28}	2
Distal interphalangeal joint, long finger ²⁹	1
Wrist flexor and/or extensor tendons ^{28,30}	2
Extra-articular involvement ³¹	19 fingers
	4 wrists
	1 palm
	1 hand

ior. Most noteworthy was the high rate of local recurrence. Whereas typical monoarticular synovial chondromatosis has a low rate of local recurrence, 14 of the 16 patients available for follow-up in their study developed locally recurrent disease. Our patient’s disease process included elements of both articular synovial chondromatosis (in an unusual and polyarticular location) and the tenosynovial chondromatosis of the hands and feet described by Fetsch and colleagues.³¹

There remains a debate about whether synovial chondromatosis is fundamentally a neoplastic process or a reactive metaplastic process. Proponents of the former position point to cytologic atypia of involved chondrocytes, cytogenetic abnormalities, and rare instances of malignant degeneration into chondrosarcoma.³² Our patient had no cytologic or architectural atypia to suggest a neoplastic process. We believe that the bony erosions seen clinically and radiographically were related to the pressure-mediated effect of numerous osteochondral loose bodies pressing firmly against the nearby bones because of the constraints of the small tenosynovial and articular structures containing them. We recommended clinical and radiographic follow-up at least once yearly for 5 years to monitor for local recurrence.

Clinicians can learn several important lessons from this unusual case. First, though synovial chondromatosis typically is monoarticular and affects large joints, this is not always the case. For any lesion characterized by multinodular osteochondral bodies associated with synovial, tenosynovial, or bursal structures, synovial chondromatosis should be considered a leading differential. Second, it is important to recognize the relative recent description of a tenosynovial chondromatosis with a predilection for the distal extremities. This condition, unlike classic synovial chondromatosis, may have a high rate

of recurrence, and awareness of this condition allows planning for patient counseling and follow-up.

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This paper will be judged for the Resident Writer's Award.
