Acta Orthop. Belg., 2005, **71**, 230-235

CASE REPORT

Recurrent synovial chondromatosis of the wrist : Case report and literature review

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Synovial chondromatosis of the wrist is rare. We report the case of a 35-year-old man with synovial chondromatosis of the left wrist with an 8-year follow-up. Frequent recurrences finally resulted in total wrist arthrodesis. A review of the literature produced 24 case reports of synovial chondromatosis of the wrist with only three cases showing recurrence.

INTRODUCTION

Synovial chondromatosis is a rare, benign, chronic, and progressive metaplasia associated with the formation of cartilage in the synovial membranes of joints, tendon sheaths or bursae, of unknown aetiology. When metaplastic foci become detached, loose bodies are produced. Synovial chondromatosis often affects the knee, hip or elbow, but rarely the hand (2% of cases). When the loose bodies undergo secondary ossification, the condition is called synovial osteochondromatosis (*15, 16*). Tenosynovial chondromatosis has many similarities to synovial chondromatosis and probably represents an extra-articular counterpart of the same disease process (*8*). In several large reported series of tumours of the hand, totalling more than 2,500 cases, synovial chondromatosis is not included (*3*).

We report a case of a 35-year-old man with synovial chondromatosis in the left wrist with an 8 year follow-up. We will discuss the clinical, radiological, histological and therapeutic features of synovial chondromatosis of the wrist based on this case and on a literature review.

CASE REPORT

In March 1996, a 35-year-old man was seen because of pain and loss of strength in the left hand : catching objects was difficult due to loss of ulnar nerve function with MCP 4 and 5 in hyperextension and the little finger in abduction. An electromyographic study (EMG) revealed a lesion of the deep branch (ramus profundus) of the ulnar nerve. Six months earlier, excision of osteophytes of the metacarpal bones III and IV had been carried out in another hospital. There was no history of trauma.

Radiographs demonstrated benign soft tissue calcifications around the dorsal and volar side of the carpal bones consistent with synovial chondromatosis (fig 1). The bones were not affected. MRI demonstrated encapsulated chondromatosis around the carpal and carpometacarpal joints.

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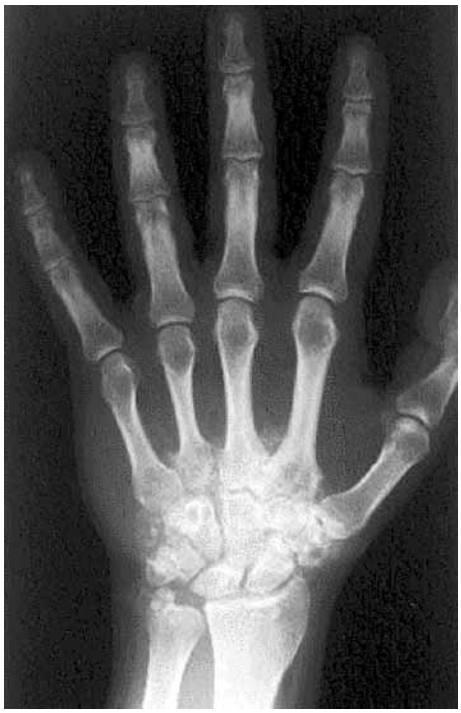

Fig. 1. — Postero-anterior radiograph view demonstrating ulnar and radial radio-opaque bodies in the carpus.

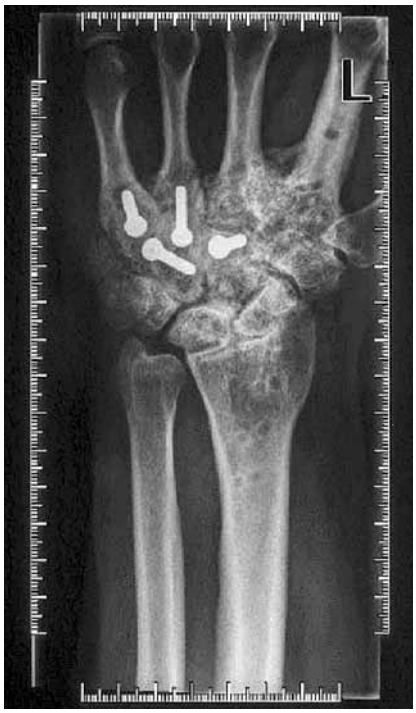

Fig. 2. — Postero-anterior radiograph view after partial removal of implants.

In April 1996, the ulnar and median nerve were decompressed and a lasso tendon plasty to correct hyperextension and to increase flexion of the 4th and 5th metacarpophanlangeal joint was done, combined with an opponent plasty to the little finger using the fourth flexor digitorum sublimis muscle.

In November 1996, compression of the ulnar and median nerve had recurred. Again decompression of both nerves was done and tissue invaded by chondromatosis was resected. Histological examination confirmed synovial chondromatosis. The postoperative course was again uneventful.

One year later, a CT-scan showed chondromatosis around the metacarpal bones, distal radius and distal ulna. The bone structure was normal. Progression of the synovial chondromatosis made de-bulking necessary at the radiocarpal joint and at the basis of the metacarpal bones.

In 2000, resection of the chondromatosis on the dorsal side and at the ulnocarpal joint was performed because of locking of the wrist.

In December 2001, arthrodesis of the left wrist was necessary for persistent pain.

In 2003, the ill-tolerated osteosynthesis material was removed and a corticocancellous graft from the left iliac crest was used to stabilise a pseudo-arthrotic area in the ulnar part of the wrist (fig 2).

Presently, the patient is free of pain.

DISCUSSION

A Pubmed® review of the literature produced 24 case reports of synovial chondromatosis of the wrist (table I).

Table I shows a gender ratio of 1 (female) / 1.2 (male). There is a peak incidence in the third and fourth decade. The mean age is 43.7 years (including our patient).

There is no preference for the left or right hand (10 left, 9 right, including our patient). The disease shows a preference for the distal radioulnar joint (N = 8).

Table I. — Overview of reported and histologically confirmed synovial chondromatosis of the wrist

Author	Sex	N**	Age	Affected Hand	Former Trauma	Localisation and Treatment*	Follow-up
Ballet *et al* (*1*), 1984	M	1	40	Left	Yes	DRJU, synovectomy and excision of chondral bodies Histological diagnosis : hyperplastic synovitis and synovial chondromatosis	No recurrence at 2 years
Bunn *et al* (*2*), 2001	M	1	45	Right	No	Pisotriquetral joint, excision mass	Unknown
De Smet *et al* (*6*), 1987	F	1	41	Left	No	DRJU, excision of calcific material and synovectomy	No recurrence at 6 months
Dujardin *et al* (*7*), 2004	F	1	50	Left	No	Compressing motor branch of ulnar nerve Pisiformectomy and excision mass around pisotriquetral joint	Unknown
Inada *et al* (*10*), 1990	F	1	49	Left	No	DRUJ and TFCC, excision mass	No recurrence at 1 year
Jones *et al* (*11*), 1987	F	1	73	Right	No	Exploration of carpal tunnel because of carpal tunnel syndrome symptoms : median nerve normal, excision of swelling of deep flexor tendons and radio-carpal joint near the lunate	Unknown
Karlin *et al* (*12*), 1981	F	1	16	Left	No	Distal radius, en bloc excisions of calcified material	Unknown
Lyritis (*13*), 1976	M	1	29	Right	Yes	Excision around inferior radioulnar joint	Unknown
Milgram (*14*), 1977	F	2	46		No	Wrist , localisation ? Excision mass	Unknown
	M		45	Right	No	Pisotriquetral joint, excision mass	No recurrence at 2 years
Ono *et al* (*15*), 1994	M	2	60	Right	No	Excision of chondral bodies and synovium around DRUJ	2 weeks post-operative pain free
	F		32	Right	No	Synovectomy pisiform and excision chondral bodies around the pisiform	Unknown
Oursin, Wetzel (*16*), 1996	M	1	45	Left	No	Distal radius, synovectomy and removal loose bodies	Unknown
Pope *et al* (*17*), 1987	M	2	43	Left	Yes	Excision of calcific material around DRUJ	Unknown
	F		49	Right	Yes	No therapy, calcific bodies around radioulnar joint unrelated to acute trauma	
Rogachefsky *et al* (*19*), 1997	M	1	34	Left	No	Prednisone 6 months and probenecid-colchicine Arthrotomy DRUJ with removal of cartilage-like tissue and synovectomy Again synovectomy with removal loose bodies and hemiresection arthroplasty of ulna 18 months later	Recurrence 18 months after first surgical procedure, no second recurrence 6 months postoperative

Table I. — Continuation

Author	Sex	N**	Age	Affected Hand	Former Trauma	Localisation and Treatment*	Follow-up
Rompen *et al* (*20*), 1999	M	1	75	Left	No	Excision mass around distal radius, carpal and metacarpal bones	No recurrence at 7 months
Roulot *et al* (*21*), 1999		4				Radiocarpal joint : 2 cases with 2 recurrences Midcarpal joint : 1 case DRUJ : 1 case Removal loose bodies and synovectomy in all cases	1 patient : Recurrence 5 years after first surgery with reoperation, 2nd recurrence 6 years later other patient : 2 recurrences
Taras *et al* (*22*), 1995	F	1	50	Right	No	Excision mass around radiocarpal joint	Unknown
Travers *et al* (*23*), 1983		1				Trapezometacarpal joint	
Von Schroeder *et al* (*24*), 1996	M	1	16	Right	No	Excision mass around DRUJ	Unknown

* Treatment in chronological order ; ** N = number of cases in case report ; DRUJ = Distal Radioulnar Joint ; TFCC = Triangular fibrocartilage complex.

Former trauma was noted in only 4 out 24 cases.

Clinical features of synovial chondromatosis include pain, localised or diffuse swelling of the joint and mechanical features such as clicking and locking due to free bodies (*8*). Rarely (in only 3 cases, including our patient) does it lead to nerve compression (*7, 11*). The confined space of the carpal tunnel may produce rapid and severe median nerve compression leading to early presentation (*11*).

Based on the clinical features the differential diagnosis of synovial chondromatosis includes septic arthritis, chondrocalcinosis, rheumatoid arthritis, osteoarthritis, synovial chondrosarcoma and osteochondromatosis. Synovial chondromatosis should not be confused with degenerative joint disease and secondary loose bodies. Scaphoid-lunate and lunate or scaphoid necrosis are often found with chondrocalcinosis (*18*).

The radiographic feature of synovial chondromatosis is usually that of the presence of radio-opaque round or oval loose bodies within the joint. Other radiographic signs include effusion, degenerative arthritis, osteophytes and subchondral sclerosis. CT-scan is useful for detecting loose bodies that may not have calcified and are not visible on plain radiographs. MRI demonstrates multiple small filling defects and offers no real advantage over CT-scan (*5*).

Two cases described in table I (Rogachefsky *et al* (*19*), Jones *et al* (*11*)) demonstrated that the diagnosis of synovial chondromatosis may be difficult in earlier stages because radiographs were normal. Later with increased calcification or ossification, small radio-opaque masses will be apparent in the joint. In the case of Rogachefsky *et al* (*19*) the signal intensity on MRI resembled that of fluid. In this stage, the process may be misdiagnosed as joint effusion. Radiographs in our patient revealed clear radio-opaque bodies consistent with synovial chondromatosis.

Microscopically, synovial chondromatosis appears as focal islands of disorganised hyaline cartilage metaplasia in synovium. This condition has aggressive cytological features including

enlarged chondrocytes, hypercellularity and pleomorphic nuclei but is a benign, self-limited condition (*5*). The synovium undergoes metaplastic cartilaginous transformation. Whether synovial chondromatosis is a neoplastic process or a reactive metaplasia is still debated. Evidence in favour of the former includes : cytologic and architectural atypia of the chondrocytes, the documentation of cytogenetic abnormalities (especially 1p13, 1p21-22, 12q13-15 and +5 alterations) in some cases, disease progression in the absence of clinical intervention, local recurrences and rare reports of malignant transformation (*8*).

Constant *et al* (*3*) described a case with a well-differentiated chondrosarcoma in an incisional biopsy. In the amputated specimen, the histological diagnosis was converted to synovial chondromatosis. It must be emphasised that these two lesions can have quite similar histological features that include increased cellularity and cellular atypia (*4*). An erroneous diagnosis of chondrosarcoma can easily be made. Only a few cases of synovial chondromatosis with malignant transformation have been documented (*3*). Clinically, the malignant lesion has a faster growth rate and greater invasiveness. There is often more pain and swelling. The bony articular erosions seen in synovial chondrosarcoma are usually absent in synovial chondromatosis (*4*). Any patient with a histological diagnosis of synovial chondromatosis who has undergone rapid deterioration of clinical features should be suspected of having malignant transformation (*9*).

In table I, no major differences in therapy are seen. Synovectomy and/or removal of loose bodies are the standard therapies.

Our patient showed many recurrences during the 8-year follow-up period, versus only 3 cases showing recurrence in our literature overview (*19, 21*). The follow-up in the case of Rogachefsky *et al* (*19*) was short (18 months). Roulot *et al* (*21*) described two patients with two recurrences respectively involving the radiocarpal joint with most recurrences developed five to ten years after the first surgical procedure. We found two other cases with a symptom-free period of two years at follow-up (*1, 14*). However, no reliable information about the recurrence of synovial chondromatosis can be derived due to the short follow-up times in our literature review. Maybe longer follow-up times would have shown more frequent recurrences.

CONCLUSION

Synovial chondromatosis is a rare disease, especially in the wrist. The diagnosis may be difficult when radiographs are normal and a CT-scan is useful for detecting non-calcified loose bodies. Nerve compression is uncommon. There is still discussion on whether synovial chondromatosis is a neoplastic process or a reactive metaplasia. There is no substantial risk for local recurrence but long term follow-up is necessary to gain more insight in the behaviour of this rare condition.

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