# Protracted *Mycobacterium kansasii* Carpal Tunnel Syndrome and Tenosynovitis

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Infection with *Mycobacterium kansasii* is most frequently manifested as pulmonary disease closely resembling pulmonary tuberculosis, albeit milder. *M. kansasii* has, on occasion, also been implicated as a cause of extrapulmonary disease, mainly septic arthritis and tenosynovitis. We report a case of *M. kansasii* infection presenting as carpal tunnel syndrome and developing into tenosynovitis of the forearm, necessitating repeated operative debridements in addition to pharmacotherapy spanning a 7 year period.

## Patient Description

A 60 year old woman presented with severe pain and swelling in her right wrist. Right carpal tunnel syndrome had been diagnosed 4 years previously. She underwent two operative procedures, 3 months apart, to relieve pressure from the median nerve with only transient relief in her symptoms. She was referred for rheumatologic consultation 1 month after the second operation, when swelling and pain in her wrist increased. Relevant medical history included diabetes mellitus type 2 for many years that lately required insulin for control, and severe asthma for which she was taking oral prednisone 10 mg/day.

Examination revealed swelling and extreme tenderness over the scar on the palmar surface of the right wrist. The rest of her physical examination was normal. Clear fluid, 1 ml, was aspirated from the area of maximal tenderness over the scar and betamethazone was injected locally. Initial cultures were sterile yet the clinical course progressed and 2 weeks later she developed tenosynovitis of her right forearm with olecranon bursitis. Olecranon bursa aspirate contained 13,000 leukocytes/μl and culture yielded growth of *Mycobacterium kansasii*. A revision of the synovial samples taken during the previous carpal tunnel operations demonstrated non-caseating granulomas.

Laboratory peripheral blood studies showed mild leukocytosis of 12,000/L with a normal differential count, erythrocyte sedimentation rate of 25 mm/hr, hyperglycemia of 200 mg/dl and hyperlipidemia. Liver enzymes and kidney function were normal. Purified protein derivative was negative at 5 TU. Human immunodeficiency virus status, rheumatoid factor and antinuclear antibodies were negative. There were no granulomas or infiltrates on chest X-ray. Radiographs of the hand disclosed periarticular osteopenia.

In accordance with the diagnosis of *M. kansasii* tenosynovitis, triple therapy with rifampicin 300 mg bid, isoniazid 100 mg tid and ethambutol 400 mg bid was initiated. After 3 months of therapy there was no regression of the olecranon bursitis in concert with laboratory evidence of isoniazid resistance. Hence, isoniazid was replaced by clarithromycin 500 mg bid in addition to surgical excision of the bursa. The surgical procedure was complicated by the formation of a fistula that necessitated two additional operations. The clinical course was further complicated by lack of compliance with mycobacterial therapy, which dictated employment of direct observed therapy under the supervision of the National Antituberculosis League.

After more than 2 years of antimycobacterial therapy in addition to three operative procedures at the olecranon bursa, complete resolution of the tenosynovitis occurred.

## Comment

We describe a patient with tenosynovitis of the wrist and forearm and olecranon bursitis due to *Mycobacterium kansasii*. The first manifestation of *M. kansasii* infection in our patient was carpal tunnel syndrome. Although the age at presentation, female gender and associated diabetes mellitus are known risk factors for the development of carpal tunnel syndrome, it should be kept in mind that ancillary causes, infection being the most hazardous, may also be the culprit. Moreover, diabetes mellitus is also a known risk factor for infections due to abnormalities in cell-mediated immunity and phagocyte function associated with hyperglycemia, as well as diminished vascularization in long-standing disease [1]. Consequently, many infections, including mycobacterial, are more frequent and severe in the diabetic population.

Unfortunately, in the present case, the pathologic report documenting the presence of non-caseating granulomas in the synovia removed during operation was disregarded, probably due to lack of awareness of infectious causes of carpal tunnel syndrome. The clinical course – after *M. Kansasii* infection was confirmed and treatment was initiated – exemplifies the problems encountered in achieving a cure. Since antimycobacterial chemotherapy did not suffice, repeated surgical debridements were required. Cure was only attained after 2 years of combined antimycobacterial and surgical therapy.

Non-tuberculous mycobacteria are ubiquitous organisms found in water and soil [2]. Although they rarely cause disseminated disease in immunocompetent hosts, they are associated with increasing frequency and localized soft tissue infections, as well as, characteristically, tenosynovitis or bursitis of the upper extremity. Most often this is seen in patients with monoarticular synovitis of the hands or wrists, especially in association with a history of periarticular trauma or exposure to marine environments [3,4]. The most common offending organisms are *M. marinum*, followed by *M. kansasii* [2]. It is assumed that most people are infected from water or other environmental sources through inoculation of the organism into superficial abrasions, puncture wounds or cuts. *M. marinum* is thus inoculated from fish tanks or swimming pools. The correct diagnosis is usually made late in the clinical course, the typical patient having experienced swelling and disability for 6 months or more, which is often misdiagnosed, and receiving corticosteroid injection. The contribution of local injection of corticosteroid to the development of mycobacterial tenosynovitis is controversial, with some authors suggesting possible inoculation by a contaminated needle and subsequent perpetuation of infection by the immunosuppressive effect of steroids.

Infections within tuberculous mycobacteria are increasingly recognized in immunocompromised hosts. More commonly described in cancer patients, AIDS patients have now taken the lead, as reduced CD4+ counts predispose to disseminated infection [3]. *M. kansasii* has been implicated in 50 published cases of septic arthritis thus far, and in tenosynovitis the ratio is about 1:5 as compared to *M. marinum* [5].

The possibility of *M. kansasii*, or any other infection, should be considered in cases of recurrent carpal tunnel syndrome, especially in patients with recognized risk factors, such as local trauma, chronic arthritis, immunosuppression or chronic steroid use. Since carpal tunnel syndrome is an extremely common condition, other rarer though important underlying causes may be masked by this "dilusional" effect. A thorough revision of the underlying diagnosis as well as the histologic material should be considered when an operated carpal tunnel syndrome does not heal. However, even after the correct diagnosis is reached, attaining a cure may necessitate prolonged pharmacotherapy as well as surgical debridement. Increased awareness and early diagnosis will also prevent contraindicated procedures such as local steroid injections and/or other immunosuppressive therapy.

## References


1. Powers AC. Diabetes mellitus. In: Braunwald E, Fauci AS, Kasper DL, Hauser SL, Longo DL, Jameson JL, eds. Harrison's Principles of Internal Medicine. 15th edn. New York: McGraw-Hill Book Co., 2001:2109–37.
2. Holland SM. Nontuberculous mycobacteria. *Am J Med Sci* 2001;1:49–55.
3. Zenone T, Boibieux A, Tigaud S, et al. Non-tuberculous mycobacterial tenosynovitis: a review. *Scand J Infect Dis* 1999;31:221–8.
4. Wada A, Nomura S, Ihara F. Mycobacterium kansasii flexor tenosynovitis presenting as carpal tunnel syndrome. *J Hand Surg (Br)* 2000;25:308–10.
5. Bernard L, Vincent V, Lortholary O, et al., and Groupe d'etude sur l'Osteite. Mycobacterium kansasii septic arthritis: French retrospective study of 5 years and review. *Clin Infect Dis* 1999;29:1455–60.



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