Tenosynovitis Caused by *Mycobacterium kansasii*: A Case Report and Literature Review

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**ABSTRACT**

We present a case of *Mycobacterium kansasii* tenosynovitis seen at Ramathibodi Hospital, Bangkok, Thailand. This 50-year-old Thai male without significant underlying disease presented with chronic tenosynovitis of the right middle and ring fingers. After experiencing failure of conservative treatment, the patient underwent surgery and surgical exploration demonstrated “rice bodies” in a region of chronic synovitis. A treatment with isoniazid, rifampicin, pyrazinamide, and ethambutol were then started. The tissue culture eventually grew *M. kansasii*. Non-tuberculous mycobacteria are not the common infectious causes of tenosynovitis and could be missed. An awareness of these pathogens and a confirmatory mycobacterial culture are crucial for the diagnosis. (*J Infect Dis Antimicrob Agents 2007;24:143-8.*)

**INTRODUCTION**

Chronic tenosynovitis caused by non-tuberculous mycobacteria (NTM) is uncommon and rarely seen in clinical practices. Among these NTM, the most common reported species are *Mycobacterium marinum*1-12 and *Mycobacterium kansasii*.1,2,12-17 Other species reported are *Mycobacterium avium* complex (MAC),1,18-24 rapidly growing mycobacteria,1,21,25-27 *Mycobacterium malmoense*,1,28-30 *Mycobacterium szulgai*,1,31,32 *Mycobacterium xenopi*,1,33 and *Mycobacterium terrae*.34-39 The diseases appear to be the result of previous trauma, surgical procedure, local corticosteroid injection, or water contamination.1,2,40 Immunosuppression is sometimes associated with the infections and can be considered as a risk factor.1,2 However, most of the cases in this entity had been delayed in diagnosis. We herein report a case with chronic tenosynovitis caused by *M. kansasii*. The
literature of reported cases with *M. kansasii* tenosynovitis is also reviewed.

**CASE REPORT**

A 50-year-old man with well controlled hypertension was admitted at Ramathibodi Hospital, Bangkok, Thailand with a history of swelling and palpable fibrotic cord along flexor surface of the right middle and ring fingers for two months. The patient had also a limitation in flexion of the proximal and distal interphalangeal joints of the affected fingers. There was no fever, numbness of finger, history of trauma, nor exposure to aquatic environment. He had been treated with multiple regimens of non-steroidal anti-inflammatory drugs, but never been treated with intraarticular injection of steroid. His laboratory test for erythrocyte sedimentation rate (ESR) was 25 mm/hour, and a complete blood count was within normal range.

He was admitted at an orthopaedic ward in February 2007. An elective surgical operation for tenosynovectomy was performed. Operative findings revealed a marked tenosynovitis of the right ring finger extending to the proximal and distal interphalangeal joints and proximally to the deep transverse carpal ligament. Several “rice bodies” were also observed along the involved flexor tendons. Synovial specimens were sent for pathological and microbiological studies. Acid-fast bacilli were not found from the acid-fast stain of the synovial tissue. Mycobacterial culture was performed with the standard method. The recovered organism was identified by the patterns of growth characteristics, pigmentation, and by biochemical tests including niacin production, nitrate reduction, semiquantitative catalase, and Tween hydrolysis testing.

Due to the presence of “rice bodies” from operative finding and the pathological report of chronic granulomatous inflammation, a medical treatment with isoniazid of 300 mg/day, rifampicin of 600 mg/day, pyrazinamide of 1,250 mg/day, and ethambutol of 1,000 mg/day were commenced before obtaining the results of mycobacterial culture.

Two weeks after the initiation of antimycobacterial treatment, the patient developed severe generalized myalgia and arthralgia without the signs of arthritis. Hyperuricemia was noted from the laboratory study, and the attending physician decided to discontinue pyrazinamide. However, the symptoms were barely improved. Pyrazinamide was then resumed.

At two months of treatment, the mycobacterial culture grew NTM with susceptibility to isoniazid, rifampicin, ofloxacin, and clarithromycin; and resistance to ethambutol and streptomycin.

The antimycobacterial regimen was then changed to isoniazid, rifampicin, and ofloxacin. His generalized myalgia was worsening without the signs of myositis nor the rising of muscle enzymes. Ofloxacin was thought to be the cause of his myalgia, and then it was changed to azithromycin of 500 mg/day.

At two and a half months of treatment, the species identification of NTM was confirmed to be *M. kansasii*. The function of his fingers was normal. Azithromycin was discontinued due to a complaint of mouth dryness.

At three months of treatment, the ESR was 49 mm/hour. He was planned to continue the antimycobacterial drugs for about a few months until his ESR returned to normal range.

**DISCUSSION**

Tenosynovitis is an inflammation of the tendon sheath. The causes of tenosynovitis depend on the course of illness whether acute or chronic. Acute tenosynovitis is generally due to a trauma or an infection, commonly caused by *Staphylococcus aureus*. According to the previous reports in 1980s,
chronic tenosynovitis can be caused by a variety of disorders including trauma, infiltrative disease such as myxedema or amyloidosis, and infection.\textsuperscript{1,44-48} Two studies of 439 and 329 cases of tenosynovitis in 1966 and 1977, respectively, the authors did not mention about the infectious cause of tenosynovitis.\textsuperscript{49,50} This might reflect a small number of cases with tenosynovitis caused by the infection in that study period.

Chronic tenosynovitis can be due to the infection caused by \textit{Mycobacterium tuberculosis} or fungi including \textit{Histoplasma capsulatum} and \textit{Sporothrix schenckii}.\textsuperscript{43} More recently, there are many reports of chronic tenosynovitis caused by NTM.\textsuperscript{1,40,43} Among these NTM, \textit{M. kansasii} is one of the most common reported species.\textsuperscript{1,2,12-17} Patients with chronic tenosynovitis may present with carpal tunnel syndrome.\textsuperscript{1,40} A tendon rupture is a rare complication, but it may happen when the correct diagnosis and appropriate treatment are delayed.\textsuperscript{51} ESR and C-reactive protein (CRP) are usually normal in most patients. Magnetic resonance imaging (MRI) is usually useful for the diagnosis characterizing by a marked synovial thickening around the flexor tendons.\textsuperscript{1} A correct diagnosis is usually made very late in the course of illness, typically more than six months.\textsuperscript{1,40} Rice-body formation can be noted in patients with NTM chronic tenosynovitis as in our patients.\textsuperscript{1} In our patient, it took 2.5 months to make the definite diagnosis of \textit{M. kansasii} tenosynovitis. A delayed diagnosis of NTM tenosynovitis is problematic, often attributable to a lack of clinical suspicion. Biopsy tissues with staining of acid-fast bacilli, culture for \textit{Mycobacterium} using Lowenstein-Jensen with a long incubation of more than twelve weeks and using two temperatures of 30°C and 37°C are the keys for identification of \textit{Mycobacterium} species.\textsuperscript{1} Our patient had received many antimycobacterial regimens due to the delayed diagnosis and intolerability to some antimycobacterial agents. His antimycobacterial regimen was changed to isoniazid and rifampicin after receiving a three-drug regimen for more than two months. Given the fact that the patient had a surgical intervention which directly decreased the bacterial burden, the course of antimycobacterial regimen may be adequate.

Another problem regarding therapeutic issue is the duration of medical treatment for this organism. \textit{M. kansasii} is a relatively drug-resistant organism, compared to \textit{M. tuberculosis}.\textsuperscript{16} However, a specific medical treatment often results in an excellent clinical response but no known exact time to discontinue the drugs.\textsuperscript{1,16} Apart from medical treatment, many reports regarded the surgical intervention as an arbitrary choice of treatment of \textit{M. kansasii} tenosynovitis.\textsuperscript{1} Although most reports recommended the surgical treatment of this entity, the indication for surgery is usually due to the worsening symptoms of patients.\textsuperscript{23} A previous study described a case of \textit{M. kansasii} tendinitis and fasciitis was successfully treated with only antimycobacterial agents for two years.\textsuperscript{52}

\textbf{References}


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