



## Atypical Infections of Tenosynovitis

Yee Phyto Hein<sup>1\*</sup> and Helen I Keen<sup>1,2</sup>

<sup>1</sup>Fiona Stanley Hospital, Australia

<sup>2</sup>School of Medicine and Pharmacology, University of Western Australia, Australia

### Abstract

Tenosynovitis consists of inflammation of a tendon and its synovial sheath secondary to infectious and non-infectious causes. We present 2 cases of atypical infections that presented as isolated wrist tenosynovitis associated with a long-term delay in identifying underlying atypical infections. One of the cases presented consisted of atypical mycobacteria, and the other involved sporotrichosis. In each case, no organism was cultured from tendon sheath aspirates. Short-term benefit was derived from injected and oral glucocorticoids in each case. Atypical infections, although uncommon, can be easily mistaken for more common immune-mediated rheumatic diseases because the clinical manifestations overlap. These cases illustrate that atypical infection should be considered with a high degree of suspicion in cases of isolated wrist tenosynovitis. Furthermore, it shows that the demonstrated short-term benefit of glucocorticoids does not exclude infection and that both aspirate of the fluid and biopsy can often be culture-negative, thus eluding detection by clinical diagnostics. A high index of suspicion and biopsy, sometimes with repeated sampling, may be necessary to achieve a diagnosis.

### Introduction

Isolated tenosynovitis may be caused by injury, repetitive use, pregnancy, inflammatory diseases such as rheumatoid arthritis or psoriatic arthritis [1] and atypical infections such as atypical mycobacteria and fungi.

Timely identification of the aetiology of is important, however fungal infections are uncommon and often difficult to diagnose. The fungi are usually present in decaying vegetation, wood and soil. These infections are commonly associated with activities such as gardening or landscaping [1]. Infection of the musculoskeletal system occurs due to either percutaneous inoculation (e.g., trauma or surgery) or haematogenous seeding [1].

Whilst atypical musculoskeletal infections are uncommon, failure to diagnose and can result in unnecessary exposure to potentially toxic DMARDs and potential worsening of the disease, which in turn can affect the prognosis and quality of life.

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#### \*Correspondence:

Yee Phyto Hein, Fiona Stanley Hospital,  
Australia,

E-mail: yeephyohein@gmail.com

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### Case Presentation

#### Case 1

An 82-year-old male with recent bowel cancer, was referred to a plastic surgeon in October 2015 with a 2-month history of right hand pain following a splinter in his right index finger. The swelling commenced at the right index finger and quickly spread to the dorsum of the hand and wrist.

A physical examination revealed a tender dorsal right hand swelling (Figure 1A) that was painful at the extreme of flexion with discharge of haemoserous exudates from the volar aspect of the right wrist.

Blood tests revealed a normal neutrophil count and Erythrocyte Sedimentation Rate (ESR) with an elevated C-Reactive Protein (CRP) level (56 mg/L).

The patient was treated for cellulitis. One month later, he visited the hospital with ongoing swelling, and was referred to a rheumatologist due to tenosynovitis of the flexor tendons in the carpal tunnel and a large amount of fluid within the tendon sheath of the flexor carpi radialis on ultrasound examination of his right hand.

Short-term improvement was noted with prednisolone, and seronegative arthritis was diagnosed. Subsequently, the patient was administering methotrexate in addition to oral prednisolone without complete resolution of his tenosynovitis. He subsequently underwent repeat ultrasound-guided



**Figure 1:** A physical examination revealed a tender dorsal right hand swelling.

right wrist cortisone injections every 3 months.

Despite variable doses of prednisolone, methotrexate and local steroid injections, the tenosynovitis persisted, and repeat ultrasound of the right hand revealed florid radiocarpal and diffuse extensor tenosynovitis with several visible calcification foci and snowstorm patterns (Figure 1B), reportedly consistent with crystal disease. Synovial fluid analysis did not reveal bacteria or crystals.

Growing concern that this case was an atypical infection led to referral for debridement and washout of the right wrist in November 2016. Subsequent culture of the synovium demonstrated *Mycobacterium abscessus*. Methotrexate and prednisolone were discontinued. 11 months were required to reach the diagnosis of atypical infection. The patient did not show significant symptomatic relief with a continued triple antibiotic regime with intravenous ceftazidime and tigecycline and oral azithromycin, and amputation was recommended.

## Case 2

A 69-year-old male electrician, with a long-standing history of psoriasis, alcohol-related cirrhosis of the liver and mild smoking related to chronic obstructive airway disease, reported a four-month history of right forearm swelling associated with knee and ankle pain prior to presentation to a rheumatologist in November 2011. He was treated with flucloxacillin by his family doctor for presumed cellulitis of the right forearm with no improvement, however short term benefit had been noted with oral corticosteroids.

A physical examination upon presentation revealed erythema, peripheral oedema and tenderness of the right forearm. He also had widespread psoriasis.

Laboratory tests showed a white cell count of  $6.09 \times 10^9/L$ , an ESR of 34 mm/h, a CRP level of 8 mg/L with negative rheumatoid factor and Anti-Cyclic Citrullinated Peptide (anti-CCP).

Ultrasound of the right forearm showed extensor tenosynovitis within the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> compartments with intact tendons, and nonbacterial or fungal growth was detected by joint fluid aspiration. A rheumatologist who suspected infection referred him for extensor synovectomy of the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> compartments on 23/4/2012. Histopathology revealed evidence of diffuse and chronic granulomatous inflammation with areas of central necrosis with no acid fast bacilli or fungi.

The patient re-presented in October 2012 with left wrist inflammation after local trauma. Ultrasound of the left hand and wrist revealed fluid within extensor tendon compartment 4 (containing the extensor digitorum and extensor indicis tendons). Extensor compartment aspiration revealed a leucocyte count of  $880 \times 10^6/L$  with 85% leucocytes and 15% mononuclear cells. He was treated with

intravenous antibiotics for presumed cellulitis with no improvement. A diagnosis of bilateral tenosynovitis secondary to psoriasis was made by a second rheumatologist, and he was administered 25 mg azathioprine daily.

In a follow-up appointment after four months, resolution of the left hand swelling and persistent right hand swelling were observed. Azathioprine was ceased due to his worsening liver function tests. The patient continued with 5 mg prednisolone.

The patient re-presented to the first rheumatologist in September 2014 with ongoing right wrist swelling, a discharging sinus in the right olecranon bursa area, left knee effusion and a discharging sinus in the left pre-tibia area. The synovial fluid culture from the left knee revealed *Sporothrix schenckii*, illustrating the effect of a long-term delay in the diagnosis of atypical infections of isolated tenosynovitis. The patient was administered 200 mg itraconazole, an antifungal agent, daily.

## Discussion

Previous studies have emphasised the importance of histological examination in arriving at a precise diagnosis. For example, the finding of granulomatous tenosynovitis in tissue specimens should alert a clinician to a possible infectious agent. Sporotrichosis should be considered in the differential diagnosis of isolated tenosynovitis, particularly when histopathology reveals granulomatous tenosynovitis [4]. A prompt tissue biopsy, histological examination and culture for bacterial, fungal and mycobacterial organisms should be considered for any clinical presentation of isolated tenosynovitis. Furthermore, the value of repeated biopsies and aspirates to optimise micro-organism discovery should not be underestimated.

Tenosynovitis in our patients was initially diagnosed as a rheumatological condition, although the possibility of atypical infections, especially *Mycobacterium* and fungi, were considered in the first consultation with a rheumatologist. A significant improvement with cortisone injection or oral prednisolone led to the misdiagnosis of the condition as a non-infective inflammatory disorder. These cases suggest that the possibility of infection (for patients with signs of atypical infections) should be excluded before arriving at the diagnosis of inflammation primarily based partly on responsiveness to glucocorticoids.

In case 1, no organisms were found in the synovial fluid analysis, but histopathology revealed *Mycobacterium abscessus*. An improvement with cortisone injection and oral prednisolone led to the misdiagnosis of inflammatory tenosynovitis and delayed diagnosis for 11 months. Likewise, in case 2, both multiple joint fluid aspirates and biopsy were negative initially. This report illustrates the importance of repeated fungal cultures from patients with recurrent granulomatous tenosynovitis despite the use of glucocorticoids.

We would like to highlight the ultrasound appearance of the patient's right hand, which revealed florid radiocarpal and diffuse extensor tendon synovitis with several visible calcification foci and snowstorm patterns (Figure1B). This appearance mimicked the ultrasound appearance of gout. However, dual energy computed tomography and multiple synovial fluid analysis did not reveal any evidence of gout crystals. Accordingly, gout was excluded. Whilst this ultrasound appearance is widely considered to be associated with gout, it is not specific [5] and, in the absence of an aspirate confirming MSU crystals, should not be considered diagnostic of gout.

## Conclusion

We conclude that although these conditions are uncommon, missing them could lead to unnecessary exposure to potentially toxic pharmacotherapeutics and delay appropriate therapy. Partial responses to local and systemic corticosteroids and other forms of immunosuppression occur with these infections and may lead to "false diagnostic security". A high index of suspicion is necessary for diagnosis.

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## References

1. Shin JE, Park JH, Yi HS, Ye BK, Kim HS. Treatment of chronic isolated finger flexor tenosynovitis through 50% dehydrated alcohol installation. *Ann Rehabil Med*. 2013;37(4):586-90.
2. Gaston MB. Infection and arthritis. In: Bijlsma J, Hachulla E, editors. *EULAR textbook of rheumatic diseases*. 2nd ed. London, UK: BMJ Publishing Group; 2015:378.
3. Ettau EP, Mcgill PE. Rhematic manifestations of tropical diseases. In: Bijlsma J, Hachulla E, editors. *EULAR textbook of rheumatic diseases*. 2nd ed. London, UK: BMJ Publishing Group; 2015. p. 1119.
4. Stratton CW, Lichtenstein KA, Lowenstein SR, Phelps DB, Reller LB. Granulomatous tenosynovitis and carpal tunnel syndrome caused by *Sporothrixschenckii*. *Am J Med*. 1981;71(1):161-4.
5. Grassi W, Meenagh G, Pascual E, Filippucci E. "Crystal clear"-sonographic assessment of gout and calcium pyrophosphate deposition disease. *Semin Arthritis Rheum*. 2006;36(3):197-202.