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**CASE REPORT** HAND

# Acute carpal tunnel syndrome secondary to MAC infection with rice bodies: a case report

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## Introduction

Acute carpal tunnel syndrome is a constellation of signs that occur due to compression of the median nerve as it passes through the carpel tunnel. This is a common chronic condition and acute cases requiring urgent surgical decompression are a rare phenomenon. Usually, acute decompression is required for traumatic fractures, dislocations, haemorrhages or vascular events.[1,2] This case study describes a mycobacterial hand infection in an urban setting presenting with acute carpal median nerve compression and rice bodies found intraoperatively.

## Case

A 51-year-old male presented to emergency with significant left wrist tenosynovitis and secondary acute carpal tunnel syndrome. He is a left-hand dominant office worker with no significant comorbidities. He has a background of intermittent de Quervain's symptoms over the prior one to two years, which have recurred in the two weeks before admission. He presented to the emergency department a week before this admission with mild pain without nerve symptoms and was discharged after a normal X-ray with analgesia and a course of prednisone. This did not have any noticeable effect on his symptoms. He undertook heavy lifting while moving house and developed shooting pains in his left hand that night. This was thought to be overuse exacerbation and he was admitted for splinting, elevation and analgesia.

At the morning ward round, he was reviewed by the consultant plastic surgeon and found to have focal swelling around his wrist, slight flexion of the fingers, pain on passive extension, and parathesia over thumb, index and middle fingers with a positive Tinel sign. He underwent an acute extended carpel tunnel release that same day under general anaesthesia. Intraoperatively when the flexor retinaculum was incised, a significant volume of synovial fluid was released under high pressure. Copious rice bodies were found within the flexor sheath (see **figures 1–3**) at the

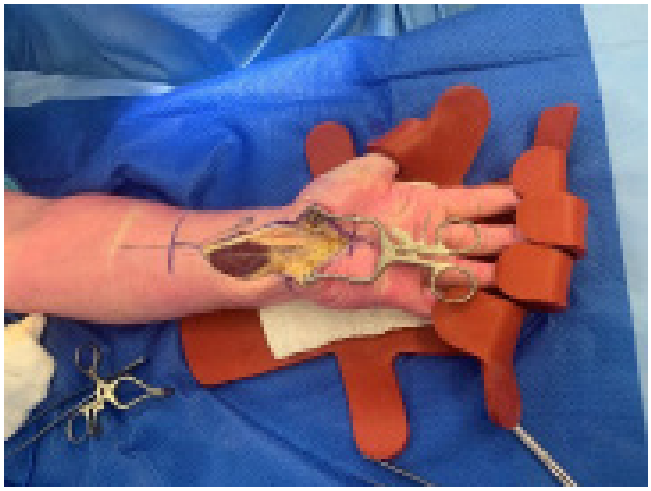

*Fig 1. Intraoperative overview*

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*Fig 2. Close up of rice bodies within the carpel tunnel*

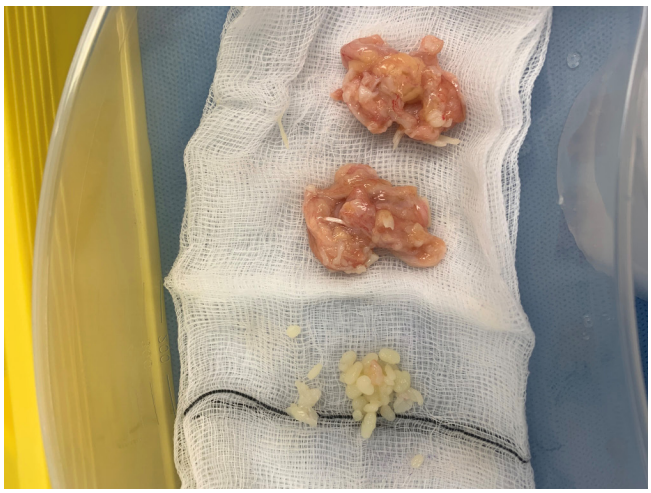

*Fig 3. Samples of rice bodies and sheath tissue*

wrist. There was compression of the median nerve and significant tenosynovitis of the flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP). The tendons were debrided to debulk the disease burden. No purulent fluid was seen. Samples of the synovial fluid were sent for microbiology, biochemistry and crystals. The rice bodies and sheath tissue were collected and sent for both microbiology and histology with extended mycobacterial cultures requested.

He recovered well postoperatively and had significant relief of his symptoms with residual paraesthesia in the median nerve distribution. Further serology was undertaken, which showed a negative rheumatoid factor and normal C-reactive protein (CRP), erythrocyte sedimentation rate (ESR) and white cell count (WCC). He had no risk factors for tuberculosis or HIV. Rheumatology was consulted with the question of an untreated seronegative rheumatoid arthritis. This was still doubtful considering his prior history, so steroids were not reinitiated. Follow up was arranged while the operative samples were being processed.

The biochemical and microscopic investigations did not yield any results. Several days later, mycobacterium intracellulare had grown from the synovial fluid and rice bodies. Histology showed chronic synovitis with scattered granulomas. The patient was notified of the results and infectious diseases was consulted. He commenced a 12-month course of antimycobacterial triple therapy (ethambutol 1.6 g daily, clarithromycin 500 mg BD and rifampicin 600 mg daily). He was followed up six months later and was still on treatment with significant improvement in function and sensation of his left hand.

## Discussion

Mycobacterium intracellulare is classified under the mycobacterium avium complex (MAC) infections. Classically MAC infections occur in immunocompromised patients and present as pulmonary infections. MAC infection in the hand is rare but it can cause tenosynovitis in immunocompetent individuals.2 This case appears to be the first description of acute tenosynovitis and carpal tunnel syndrome requiring urgent surgical decompression and debridement secondary to MAC infection.

In comparison to the literature, our case was atypical with a young patient aged 51 years, when other cases are in the sixth to eighth decade of life. There was no indicator for immunocompromise, no previous trauma or surgery, and history and serology did not support rheumatism. One case series (n = 17) described a chronic clinical course and noticed a history of trauma, surgical procedure or steroid injection could be identified as a possible inoculation event.[2] The literature indicates that diagnosis of MAC infection is usually delayed with at least one year of symptoms.[3] The main finding that alerted the surgeon to think about extended cultures was the presence of rice bodies. Rice bodies in the wrist have been associated with tuberculosis and inflammatory arthritides such as rheumatoid arthritis. Rice bodies found in the wrist have been associated with MAC infection.[4–6] MAC infection can also be considered for patients with chronic symptoms thought to be due to rheumatoid arthritis as these patients may have been treated with steroids as a local injection or orally, both of which can be risk factors for MAC infection. Some papers suggest MRI is useful for diagnosis and surgical planning;[4,6,7] however, our

case required prompt surgical intervention to prevent irreversible damage to the median nerve.

The cure for MAC hand infections requires extensive debridement and antimycobacterial therapy.[2,3] One case in the literature used antimycobacterial therapy alone and developed recurrence.[7] Antimycobacterial agents are usually rifampicin, ethambutol and clarithromycin; however, there are controversies around adverse side effects and lack of evidence around duration.[8] Some individuals have to discontinue medical therapy due to side effects and there has not been a recurrence.[9] Furthermore, there is one case report of radical surgical debridement alone without medical therapy that had no signs of recurrence at two years.[10] This supports the notion that the main modality of treatment is debridement of disease as in this case report.

## Conclusion

This is the first case report of a MAC infection in the hand presenting as an acute carpal tunnel syndrome requiring surgical intervention. The key lesson for plastic surgeons presented with an acute carpal tunnel of unknown aetiology is to send bacterial, fungal and mycobacterium cultures in addition to the routine histological examination. Rice bodies seen intraoperatively should raise suspicion for atypical mycobacterial cause as well as the standard rheumatologic conditions. Core components of treatment are surgical debridement and medical antimycobacterial therapy.


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### Patient consent

Patients/guardians have given informed consent to the publication of images and/or data.

### Conflict of interest

The authors have no conflicts of interest to disclose.


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## References


1 Schnetzler KA. Acute carpal tunnel syndrome. *J Am Acad Orthop Surg*. 2008;16(5):276–82. https://doi.org/10.5435/00124635-200805000-00006 PMid:18460688

2 Hellinger WC, Smilack JD, Greider Jr JL, Alvarez S, Trigg SD, Brewer NS, Edson RS. Localized soft-tissue infections with Mycobacterium avium/Mycobacterium intracellulare complex in immunocompetent patients: granulomatous tenosynovitis of the hand or wrist. *Clin Infect Dis*. 1995;21(1):65– 69. https://doi.org/10.1093/clinids/21.1.65 PMid:7578762

3 Chien JT, Hsiao FT, Chen YC, Chen YH, Lay CJ, Tsai CC. Three cases of successful treatment of granulomatous tenosynovitis. *Tzu Chi Med J*. 2011;23(4):145–48. https://doi.org/10.1016/j.tcmj.2011.10.002

4 Matcuk GR, Patel DB, Lefebvre RE. Horseshoe abscess of the hand with rice bodies secondary to mycobacterium avium intracellulare infection. *Clin Imaging*. 2020;63:24– 29. https://doi.org/10.1016/j.clinimag.2020.02.015 PMid:32120309

5 Saraya T, Fukuoka K, Maruno H, Komagata Y, Fujiwara M, Kaname S, Arimura Y, Yamada A, Takizawa H. Tenosynovitis with rice body formation due to Mycobacterium intracellulare infection after initiation of infliximab therapy. *Am J Case Rep*. 2018;19:656–62. https://doi.org/10.12659/AJCR.908785 PMid:29875354 PMCid:PMC6020799

6 Nagasawa H, Okada K, Senma S, Chida S, Shimada Y. Tenosynovitis with rice body formation in a non-tuberculosis patient: a case report. *Ups J Med Sci*. 2009;114(3):184–88. https://doi.org/10.1080/03009730902931408 PMid:19736610 PMCid:PMC2852770

7 Akahane T, Nakatsuchi Y, Tateiwa Y. Recurrent granulomatous tenosynovitis of the wrist and finger caused by Mycobacterium intracellulare: a case report. *Diag Microbiol Infect Dis*. 2006;56(1):99–101. https://doi.org/10.1016/j.diagmicrobio.2006.03.001 PMid:16650959

8 Kaji Y, Nakamura O, Yamaguchi K, Nomura Y, Oka K, Yamamoto T. Combined administration of rifampicin, ethambutol, and clarithromycin for the treatment of tenosynovitis of the hand caused by mycobacterium avium complex: case series and literature review. *Medicine*. 2021;100(17):e25283 https://doi.org/10.1097/MD.0000000000025283 PMid:33907090 PMCid:PMC8084042

9 Kreutz-Rodrigues L, Bakri K. Tenosynovitis due to Mycobacterium avium complex. *N Engl J Med*. 2019;381(25):2461. https://doi.org/10.1056/NEJMicm1901520

10 Moores CD, Grewal R. Radical surgical debridement alone for treatment of carpal tunnel syndrome caused by mycobacterium avium complex flexor tenosynovitis: case report. *J Hand Surg Am*. 2011;36(6):1047–051. https://doi.org/10.1016/j.jhsa.2011.03.008 PMid:21571445