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Recent advance

Non-tuberculous mycobacterial infections of the hand

Infections mycobactériennes non tuberculeuses de la main

N. Balagué [a,d,*,1], I. Uçkay [b,1], P. Vostrel [a], H. Hinrikson [c], I. Van Aaken [a], J.-Y. Beaulieu [a]

[a] *Hand Surgery Department, Geneva University Hospitals and Faculty of Medicine, University of Geneva, Geneva, Switzerland*
[b] *Service of Infectious Diseases, Geneva University Hospitals and Faculty of Medicine, University of Geneva, Geneva, Switzerland*
[c] *Laboratory of Bacteriology, Geneva University Hospitals and Faculty of Medicine, University of Geneva, Geneva, Switzerland*
[d] *Hand Surgery Department, Centre Hospitalier du Valais Romand, Hôpital de Sierre, Sierre, Switzerland*

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Abstract

Non-tuberculous mycobacterial infections of the hand are difficult to treat and require a long time before remission. But how long should we wait to see an improvement? To answer this question, the published scientific literature was reviewed in English, French and German. Tuberculosis, arthritis and osteomyelitis cases were excluded. A total of 241 non-tuberculous mycobacterial hand infections in 38 scientific publications were retrieved. Most were case reports or series. The median age of the patients was 58 years and one third was female. Patients were immunocompromised in 17 episodes. The most common species were *Mycobacterium marinum* in 198 episodes (82%), followed by *M. chelonae* in 13 cases (5%). There were no cases of mixed infection. Most infections were aquatic in origin and community-acquired, and were treated with a combination of surgical debridement and long-duration systemic combination antibiotic therapy (14 different regimens; no local antibiotics) for a median duration of 6 months. The median number of surgical procedures was 2.5 (range 1–5). Clinical success was not immediate: a median period of 3 months (range 2–6) was necessary before the first signs of improvement were observed. The majority (173 cases; 76%) remained entirely cured after a median follow-up time of 1.7 years (range, 1–6). Only two microbiological recurrences occurred (1%). However, 49 patients (21%) had long-term sequelae such as pain, stiffness and swelling. The approach of long-duration antibiotic treatment in combination with repeated surgery for mycobacterial soft tissue infections of the hand leads to few recurrences. However, clinical success is not immediate and may take up to 3 months.

Type of study. – Therapeutic study: systematic review of level III studies.

Level of evidence. – III.

Keywords: Mycobacteria; Tenosynovitis; Treatment

Résumé

Les infections mycobactériennes non tuberculeuses de la main sont difficiles à traiter et requièrent une longue période de rémission. Mais quel délai faut-il avant d'observer une amélioration ? Nous avons effectué une revue de la littérature en anglais, français et allemand. Les cas de tuberculose, d'arthrite et d'ostéomyélite ont été exclus. Au total, 241 infections mycobactériennes non tuberculeuses de la main ont été recensées dans 38 articles scientifiques. L'âge moyen des patients était de 58 ans ; un tiers étaient des femmes. Les souches les plus fréquentes étaient des *Mycobacterium marinum* (82 % des cas), suivis par *M. chelonae* (13 %). Il n'y avait pas de cas d'infection à germes multiples. La plupart des infections ont été traitées par association de traitement chirurgical et de combinaisons d'antibiotiques au long cours avec une durée moyenne de 6 mois. Le nombre moyen d'interventions chirurgicales était de 2,5 (2–6). L'efficacité clinique n'était pas immédiate. Un délai moyen de 3 mois (2–6) était observé avant d'obtenir les premiers signes d'amélioration. La plupart des patients (173 cas, 76 %) étaient entièrement guéris après un

* Corresponding author at: Hand Surgery Service, Geneva University Hospitals, 4, rue Gabrielle-Perret-Gentil, 1211 Geneva 14, Switzerland.
E-mail address: nbalague@hotmail.com (N. Balagué).
[1] Equal contribution as first author.

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suivi moyen de 1,7 an (1–6). Seules deux vraies récurrences microbiologiques ont eu lieu (1 %). Quarante-neuf patients (21 %) ont gardé des séquelles à long terme, telles que douleurs, raideur et tuméfaction. La combinaison d'un traitement antibiotique au long cours et d'un traitement chirurgical dans le cadre d'infections des tissus mous de la main permet d'obtenir une guérison avec peu de récidives. Cependant le succès clinique n'est pas immédiat et peut prendre jusqu'à 3 mois.

Mots clés : Mycobactéries ; Ténosynovite ; Traitement

1. Introduction

Non-tuberculous mycobacteria (NTM) are worldwide environmental organisms and cause chronic infections in humans [1,2]. Among all 120 species, *Mycobacterium avium*, *M. intracellulare*, and *M. kansasii* are most often involved in human lung infections [3–8]. Infections at other sites such as skin, bones or lymph nodes have also been described. Data about hand tenosynovitis caused by NTM are lacking, but according to clinical experience, hands and wrists are common sites of infection. This is probably due to a higher probability of penetrating injuries in these areas. The risk of infection seems to be higher in immunosuppressed patients [9–12].

Recurrent themes in NTM hand infections are the time elapsed between the appearance of symptoms and correct diagnosis, and the long wait until the first signs of improvement manifest themselves despite correct medical and surgical therapy. We performed this literature review to remind hand surgeons and other clinicians about the possibility of NTM infection, and to improve the therapeutic management of these rare infections, which may lead to poor prognosis such as amputation.

2. Material and method

2.1. Illustrative case report

A 77-year-old right-handed, immune-competent woman with no remarkable history presented to our hospital with persistent swelling and pain in the non-dominant index finger, which had been present for more than 5 months. No fever or trauma had been recorded. Serum C-reactive protein levels were within the normal values. She had been treated initially with a local corticosteroid injection and then with surgical release of the A1 pulley for suspected stenosing tenosynovitis. Because her symptoms worsened after the initial treatment, she was referred to our hospital. Based on the finger's appearance, which was diffusely swollen, and worsening of the symptoms despite implementation of antibiotic treatment consisting in amoxicillin and clavulanic acid intravenously (Fig. 1), we performed a radical surgical debridement with local tenosynovectomy. Intraoperatively, there was no bogginess, no arthritis, but a diffuse low-grade infiltration of soft tissues with rice bodies. The histology assessment revealed a granuloma with giant cell reactions; the Ziehl-Neelsen staining was positive, thus justifying the introduction of combined empirical oral anti-mycobacterial therapy. The final microbiological diagnosis of *M. avium complex* was confirmed by polymerase chain reaction (PCR) and mycobacterial cultures 14 and 25 days later, respectively. Oral therapy was adjusted with clarithromycin 1000 mg per day, ethambutol 800 mg per day, and rifampicin 600 mg per day. Hand rehabilitation was initiated 1 week after surgery. Even though the pathogen was susceptible to our empiric regimen, and the initial synovectomy was complete, the patient needed a second and third surgical debridement 2 and 5 weeks later because of progression of the swelling and pain in the wrist, and then for moderate discharge from the scars. The entire tendon sheath of the index and almost all the pulleys had disappeared. Only parts of the A2 and A4 pulleys were intact. The carpal tunnel was involved. No new pathogens were found. Antibiotic therapy and hand rehabilitation were continued. The patient only improved significantly after a fourth debridement 9 months later with an A2 pulley reconstruction. The patient is still being treated with the same antibiotic combination; without side effects. This unsuccessful disease progression led us to perform this review.

Fig. 1. Clinical aspect of the infected finger after second surgical debridment. Own case report, please pay attention to the diffuse non-collected soft tissue infection of the index.