



Case Report

# Chronic recalcitrant paronychia in a farmer

Eckart Haneke, MD, PhD<sup>1</sup>, Max Philip Gabutti, MD<sup>1</sup>, Christin Pelzer, MD<sup>2</sup>, Matilde Iorizzo, MD, PhD<sup>3</sup>

<sup>1</sup>Department of Dermatology, Inselspital, University of Bern, Bern, <sup>2</sup>Department of Dermatology, Venereology and Allergology, Kantonsspital St. Gallen, St. Gallen, <sup>3</sup>Private Dermatology Practice, Bellinzona, Switzerland.

## ABSTRACT

Chronic paronychia is a common condition mainly afflicting middle-aged women. It is usually due to long-standing and repeated irritation and contact with moisture. We observed a male farmer with chronic paronychia. Cow hair was found under the proximal nail fold of the right middle finger. Bacterial culture revealed *Mycobacterium elephantis* in addition to mixed aerobic and anaerobic bacteria. Avulsion of the radial nail strip and phenolisation of the matrix horn led to a rapid and sustained resolution.

**Keywords:** Chronic paronychia, Cow hair, *Mycobacterium elephantis*, Treatment, Foreign body reaction

## INTRODUCTION

Paronychia is an alteration of the nail folds and immediate surrounding skin of the nail unit. It may be acute and caused by trauma or infection, or chronic and due to a variety of infections and repeated irritation. Usually, paronychia lasting longer than 6 weeks is categorised as chronic paronychia. Most cases are seen involving the fingers of women aged 30–60 years. Its aetiology is often not entirely clear. It is assumed that repeated trauma due to long-term contact with water and chemical solutions, allergic reactions, and mechanical manipulation may lead to injury to the cuticle and loss of its sealing function for the nail pocket. This plays an important role in the development of chronic paronychia. Secondary microbial contamination or even infection is common. The treatment is always challenging as the condition is often self-aggravating.

## CASE REPORT

A 63-year-old male Swiss farmer was referred with recalcitrant greenish discolouration of the radial side of the right little fingernail and both sides of the right middle fingernail [Figure 1]. Treatment with soaks of diluted white vinegar and octenidine hydrochloride 2% solution, several times a day was recommended. While the little fingernail and the ulnar side of the middle fingernail healed within several weeks, the radial

side of the nail improved only slightly. Infact, over the course of 8 months, it became worse and developed painful swelling with reddening of the radial quarter of the proximal nail fold. The fold appeared retracted and lacked the cuticle laterally. Its free margin was rounded in the radial quarter. The nail was dirty greenish in colour, and showed distal-lateral onycholysis [Figure 2]. Probing allowed the instrument to be inserted under the proximal nail fold virtually to the bottom of the cul-de-sac. However, over the following 8 weeks, the conditions worsened and became more painful [Figure 3].

The patient was scheduled for surgical avulsion of the radial nail strip under block anaesthesia with 0.5% ropivacaine. After completion of the anaesthesia, the space under the proximal nail fold was cleaned, yielding characteristic cow hairs. A narrow lateral strip of the nail was cut longitudinally and avulsed [Figure 4]. The most lateral portion of the matrix was cautiously cauterised with 88% phenol, 3 cycles of 1 min each [Figure 4a]. Healing was uneventful and completed within 10 days [Figure 5]. The cuticle formed spontaneously again over 4 weeks. No specific antibiotic therapy was needed. Histopathology of the nail strip demonstrated plenty of bacteria on its undersurface, but periodic acid–Schiff stain did not show invading fungi. A bacterial and mycological swab of the affected area was taken. The bacterial culture yielded a mixed aerobic and anaerobic flora as well as *Mycobacterium*

\*Corresponding author: Eckart Haneke, Department of Dermatology, Inselspital, University of Bern, Bern, Switzerland. haneke@gmx.net

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**Figure 1:** Paronychia of the right middle and fifth finger at first consultation.



**Figure 3:** Paronychia of the radial half of the proximal nail fold of the right middle finger, one year after initial presentation.



**Figure 2:** Paronychia of the radial half of the proximal nail fold of the right middle finger, ten months after the initial presentation.



**Figure 4:** (a) The affected radial nail plate margin has been avulsed. (b) Cow hairs extracted from under the proximal nail fold.

*elephantis* (100–200 colonies: ++) on selective culture media. The patient re-consulted 2 years after the surgery, reporting that he had been free from paronychia for approximately 18 months. However, the non-operated ulnar side of the right middle fingernail had now developed an insidious inflammation with thickening of the soft tissue and disappearance of the cuticle of the ulnar half of the proximal nail fold, roughly 6 months ago. As requested, another identical intervention was performed on the ulnar half. Healing was again uneventful. After 18 months, the right middle fingernail inflammation was completely resolved [Figure 6].

## DISCUSSION

Chronic paronychia is a relatively common condition affecting more women than men. It has been observed with

many different occupations, particularly where prolonged contact with water or other fluids is associated with chronic repeated trauma.<sup>[1]</sup> The aetiology is often not entirely clear; however, wet work and manicures appear to play a major pathogenetic role. If these predisposing factors are not corrected, recurrence of paronychia is frequent. Once the cuticle has disappeared, the underlying nail detaches from the eponychium, and foreign bodies easily get trapped under the proximal nail fold. The patients are usually not able to identify as to what happened first, the loss of the cuticle or the inflammation. Wet work renders the skin soft, damages the cuticle, and allows foreign bodies to penetrate. *Candida albicans* was long held responsible for chronic paronychia, particularly in homemakers, chefs, butchers, fishmongers, and other similar wet-work professions. An immediate-type of contact allergic reaction to food ingredients has been shown to be a potential cause, and treatment with



**Figure 5:** Condition of the nail fold 24 hours after phenolisation.



**Figure 6:** Outcome of surgery, three years after phenolisation.

potent topical corticosteroids is recommended.<sup>[2,3]</sup> Chronic allergic contact dermatitis is also frequently seen and may be suspected on histopathology and proven by patch test.<sup>[4]</sup> Our patient had no history of contact allergy but carried out hard manual work as a farmer raising cattle, leading to chronic and repeated trauma.

The course of chronic paronychia is commonly prolonged, as was seen in our patient. Green nail discoloration suggests colonisation, or even infection, with *Pseudomonas aeruginosa*, which often responds to soaks with dilute vinegar, bleach, or antiseptic solutions, such as octenidine.<sup>[5]</sup> After an initial improvement, paronychia recurred on one side of the middle fingernail, even getting worse. The therapeutic problems were discussed with the patient who agreed for minor surgical intervention with avulsion of the lateral nail strip and phenolisation of the matrix horn. This led to an immediate improvement and sustained resolution. During the surgical procedure, cow hairs were retrieved from under the nail fold.

This phenomenon is known as an occupational disease in hairdressers, with human hair shafts getting trapped under the proximal nail fold causing chronic paronychia<sup>[6,7]</sup>, or piercing the skin (interdigital space, or under the nail) with resultant interdigital pilonidal sinus formation.<sup>[8-10]</sup> Cow hair is harder than human hair. It can be clinically differentiated from human hair by its thickness and tapered ends.<sup>[11]</sup>

The entrapment of foreign bodies such as (cow) hairs under the nail fold predisposes to a chronic foreign-body reaction that, over weeks and months, leads to a fibrotic thickening with rounding of the fold's free margin.<sup>[12,13]</sup> This results in the loss of the cuticle and is a perfect example of a vicious cycle.<sup>[1]</sup> Such a reaction does not remain sterile; hence, the demonstration of bacteria and fungi, mainly *Candida* spp., is common. In our patient, both aerobic and anaerobic bacteria were cultured including *P. aeruginosa*. To the best of our knowledge, *M. elephantis* has never been isolated from chronic paronychia and was a surprise finding. This organism has most commonly been observed in humans with chronic lung conditions<sup>[14-18]</sup> and recently as a cutaneous infection with lymphocutaneous spread.<sup>[19]</sup> A few reports of this infection exist in cows, explaining its presence in our patient.<sup>[20-23]</sup> However, its pathogenetic role in our case remains doubtful as paronychia healed rapidly after matrix horn phenolisation. Subsequent cultures also failed to demonstrate the organism. This could be because phenol is a potent antiseptic agent, and the lateral horns (potentially contaminated with *P. aeruginosa* and *M. elephantis*) were eliminated with phenolisation.

## CONCLUSION

This case is reported to present recalcitrant chronic paronychia in a farmer due to cow hair and potentially *M. elephantis*, to raise awareness about the atypical features.

## Authors' contributions

EH has seen the patient, made the diagnosis, performed the biopsy, saw the histopathology, performed the treatment, drafted and wrote the manuscript. MPG has seen the patient, performed the biopsy, and the treatment, and read the manuscript. MI and CP proofread the manuscript and organised the manuscript.

## Ethical approval

Institutional Review Board approval is not required.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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## Conflicts of interest

Dr. Matilde Iorizzo and Dr. Eckart Haneke are on the editorial board of the Journal.

### Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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