Infection of finger caused by *Morganella morganii* leading to digital amputation

A case report

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Abstract

**Rationale:** Digital infection is a common disease in clinic, featured by pain and swelling of digits. As far as we know, no article has reported a case of digital infected by *Morganella morganii*.

**Patient concerns:** A 58-year-old Chinese female complains about whitlow with pain and swelling for 2 weeks. She has a history of diabetes for 10 years. She received incision and drainage before coming to our hospital and preoperative X-ray of left ring finger presented no bone eroded.

**Diagnosis:** She is diagnosed with infection of ring finger caused by *M morganii* in our hospital.

**Interventions:** We perform aggressive operative debridement and drainage firstly. Meanwhile, we provide tissue samples for diagnosis and the result indicates *M morganii* infection. Then, she is treated with anti-infection therapy and regulation of diabetes. However, 1 week after first surgery, her condition deteriorate presenting bone erosion in distal phalanx of ring finger from X-ray.

**Outcomes:** At 3-month follow-up, the patient has a satisfactory result and X-ray shows no bone eroded.

**Lessons:** Clinicians should consider *M morganii*, which is rare in hand infection, as a cause of digital infection. This case reminds us that some whitlow is dangerous, amputation should be considered if necessary.

**Abbreviations:** CRP = C-reactive protein, ESR = erythrocyte sedimentation rate, WBC = white blood cell.

**Keywords:** digit, infection, *Morganella*, whitlow

1. Introduction

Whitlow is a common digital infection caused by various bacterium. Previous study[1] reported that the incidence of whitlow, characterized by serious pain and localized erythema, ranged from 2.5% to 15.9%. In 1983, William whitlow, characterized by serious pain and localized erythema, infection by *M morganii* was of clinical significance. As far as we know, no report has described hand infection caused by *M morganii*. Here, we show a rare case on digital infection caused by *M morganii* after whitlow.

2. Consent

The current study was approved by the patient for publication of this case report and any accompanying images and ethics committee of Affiliated Hospital of Hebei University. Informed written consent was obtained from the patient for publication of this case report and accompanying images.

3. Case report

A 58-year-old woman, who has a history of diabetes for 10 years, complains about whitlow with pain and swelling in left ring finger for 2 weeks. She was treated with incision and drainage for whitlow in another hospital. Nevertheless, condition turns out to be worse off. Skin inflames in palm and dorsal side of left ring finger and palm, as shown in Figs. 1 and 2. But X-ray presents no abnormal change (Fig. 3). The patient body temperature maintains from 38 to 39°C. The blood indices at first show that white blood cell (WBC): 12.1 x 10^9/L (normal range from 4 to 10 x 10^9/L), C-reactive protein (CRP): 21 mg/L (normal range from 0 to 10 mg/L), erythrocyte sedimentation rate (ESR): 45 x100A/mm/h (normal range from 0 to 20 mm/h), and blood glucose: 7.3 mmol/L (normal range from 3.9 to 6.1 mmol/L). In order to gain clinical improvement, we decide to conduct operation for the patient. Then, S-type longitudinal incision is made and radical debridement and drainage is performed, as shown in Fig. 4. Tissue samples and purulent secretion are collected for diagnosis and the result indicates *M morganii* infection, which is sensitive to piperacillin. The patient is diagnosed with *M morganii* infection in left ring finger. Then, the patient is treated with anti-infection treatment and regulation...
of diabetes. One week after surgery, the aggravation of the
disease is manifested as the aggravation of skin swelling and the
X-ray shows osteolysis in distal phalanx of left ring finger in
Fig. 5. The patient body temperature maintains from 38 to 39°C.
The blood variables show that WBC: 11.9 × 10^9/L, CRP: 20 mg/
L, ESR: 40 mm/h, and blood glucose: 6.9 mmol/L at the second
time. Considering the severity of the illness, we decide to perform
left ring finger amputation, as shown in Figs. 6 and 7. At 3-month
follow-up, pain and swelling in left ring finger relieve and the
laboratory tests show that WBC: 7.3 × 10^9/L, CRP: 7 mg/L, ESR:
9 mm/h, and blood glucose: 6.5 mmol/L. X-ray presents no bone
resorption at final follow-up.

4. Discussion

Whitlow is a common hand infection. Incision and drainage is the
main procedure to treat this disease. Patel et al[4] presented a rare
case of 15-month child with recurrent herpetic whitlow. Wang
et al[5] showed a case on recurrent whitlow infected by
Mycobacterium tuberculosis. X-ray showed that radius, ulna,
and carpal were eroded. Finally, forearm amputation and
antituberculosis therapy were performed. Here, we show a rare
case on digital infection caused by M morganii.
treated with anti-infection therapy and regulation of diabetes. But, a week after surgery, we could see osteolysis in ring finger from X-ray, which is related with M. morganii infection from Fig. 5. We perform left ring finger amputation due to serious condition correlated with M. morganii infection. Three months after surgery, condition of this patient is good, proving that amputation successfully stopped deterioration of illness.

It is well known that M. morganii, belonging to the tribe Proteae of family Enterobacteriaceae, is considered as a rare cause of infection in human beings. Morganella morganii was first found by William. Since then, an increasing number of reports have been reported that this bacteria could cause urinary tract infections, skin and soft tissue infection, or even lead to fatal consequences. As far as we know, hand infection by M. morganii has not been reported ever before, implying no experience as a reference to treat this disease. Previous study reported a case that a diabetes mellitus patient suffered from septic arthritis infected by M. morganii. Our case shows osteolysis in distal phalanx of left ring finger from X-ray a week after debridement and drainage. To prevent the process of disease, we consider finger amputation as the best plan. Up to now, efficacy of amputation is satisfactory. This method treating this disease has some limitations. First, we need a long follow-up to prove efficacy; second, we lack experience to deal with this rare case and we doubt if amputation is radical; third, we need more cases to assess this treatment.

In conclusion, there is no report on digital infection by M. morganii for surgeons to refer to. And we provide a method for surgeons when facing the rare case like this. But we also need further study to observe efficacy in long-term follow-up.

**Author contributions**

Conceptualization: Yanan Niu.
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**References**

[1] Szinnai G, Schaad UB, Heininger U. Multiple herpetic whitlow in a 4-year-old girl: case report and review of the literature. Eur J Pediatr 2001;160:528–33.
[2] Williams EW, Hawkey PM, Penner JL, et al. Serious nosocomial infection caused by Morganella morganii and Proteus mirabilis in a cardiac surgery unit. J Clin Microbiol 1983;18:3–9.
[3] Singla N, Kaitha N, Gulati N, et al. *Morganella morganii* could be an important intensive care unit pathogen. Indian J Crit Care Med 2010;14:154–5.

[4] Patel R, Kumar H, More B, et al. Paediatric recurrent herpetic whitlow. BMJ Case Rep 2013;2013:bcr2013010207.

[5] Wang T, Zhao G, Rui YJ, et al. Left extensive infection in the forearm caused by whitlow infected by *Mycobacterium tuberculosis*: a case report. Medicine 2017;96:e8992.

[6] Lee IK, Liu JW. Clinical characteristics and risk factors for mortality in *Morganella morganii* bacteremia. J Microbiol Immunol Infect 2006;39:328–34.

[7] Thomas VA, Kumar TS, Agarwal I, et al. Unusual cause of brain abscess in an infant. J Pediatr Neurosci 2007;2:94–5.

[8] Gautam V, Gupta V, Joshi RM. *Morganella morganii*-associated arthritis in a diabetic patient. J Clin Microbiol 2003;41:3451.