

## Case Report



# Recurrent soft tissue infection mimicked a cutaneous tuberculosis: A case report

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### Abstract

Recurrent cellulitis is one of the cutaneous tuberculosis mimickers. As a skin lesion can mimic other skin diseases, the diagnosis can easily be missed especially in immunocompetent patients without any other risk factors. We present a case of a 62-year-old female patient with the history of right hand extensor tenosynovitis presented with right hand and forearm swelling and pain, associated with fever. Clinically, her right hand and forearm were erythematous with a small nodule at the right elbow. She was treated for recurrent right upper limb cellulitis and thrombophlebitis complicated by septic shock needing several courses of antibiotics. However, she did not show any significant response to the treatment. Multiple septic work ups were carried out and all were negative, except aspiration of her right elbow nodule was positive for *Mycobacterium tuberculosis*. An anti-tuberculous treatment was started but unfortunately, she succumbed due to nosocomial infection.

### Introduction

Overall, about 10 million people were infected with tuberculosis (TB) worldwide in 2019 and the high TB burden countries accounts for 87% of new TB cases.<sup>1</sup> Malaysia is an intermediate TB burden country with less than 100 cases for every 100,000 population.<sup>2</sup> Extrapulmonary tuberculosis accounts up to 13% of all TB cases and the skin is involved in about 1% to 2% of cases.<sup>3-5</sup> Cutaneous tuberculosis (CTB) is uncommon and may mimic other skin conditions. Therefore, it is important for clinicians to recognize and treat the disease early.

We present a case of a middle-aged female patient who was treated for tenosynovitis of the right hand and subsequently was admitted to the ward for recurrent episodes of cellulitis before the diagnosis of cutaneous tuberculosis was made.

### Case Report

A 62-year-old lady presented to our hospital with a one-week history of right hand and forearm swelling and pain, associated with fever. She had a poor appetite throughout this period, but no significant weight loss. She had no cough, night sweats, or symptoms suggested an infection. There was no history of trauma or insect bite. Further probing of her past history revealed that she was treated for tuberculous arthritis in March 2014. At that time, she presented with swelling of the right

3<sup>rd</sup> proximal interphalangeal joint (PIPJ) and the plain radiograph of her hand showed right 3<sup>rd</sup> PIPJ erosion. Biopsy and histopathological examination (HPE) of the 3<sup>rd</sup> PIPJ confirmed granulomatous lesions consistent with TB infection. She was treated with anti-TB treatment but unfortunately, she defaulted her follow-up after 4 months of anti-TB treatment (about 68% of total treatment).

She was on simvastatin for her dyslipidemia. She got to the Rheumatology Clinic for the extensor tenosynovitis of the right hand 3 months previously and she was treated with a cyclooxygenase-2 (COX-2) inhibitor.

On examination, her blood pressure was 124/78 mmHg, pulse rate was 92 beats/minute and temperature of 38.9° Celsius was measured. She appeared septic. Her right hand and forearm were swollen, warm, tender, and erythematous. There was a warm, tender, and non-discharging small nodule (2 x 1 cm) at the right elbow. Her right radial and ulnar pulses were palpable, capillary refill time was less than 2 seconds and she was not cyanosed. Examination of her lungs, heart, and abdomen was unremarkable.

Laboratory investigations showed a normal full blood count, normal renal and liver function, hypoalbuminemia, (serum albumin of 18 g/L) and elevated inflammatory markers (CRP: 77.1 mg/L, ESR: 82 mm/Hr). Plain radiographs of the right hand and forearm showed no soft tissue shadowing and osteomyelitis changes and her chest

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radiograph was normal. She was treated for right upper limb cellulitis with IV augmentin/clavulanate and was given regular doses of celecoxib to control the pain.

Throughout admission, her fever never resolved and her right upper limb cellulitis worsened. She also had recurrent thrombophlebitis in her left upper limb. Her antibiotics were upgraded to IV piperacillin/tazobactam, IV azithromycin and IV meropenem in that order, during her hospital stay.

Repeated septic screening, including a few sets of blood cultures for aerobic and anaerobic bacteria and fungi showed no growth. Serology for hepatitis B, hepatitis C, HIV, and melioidosis was negative. Her blood glucose level was normal. Her inflammatory markers (ESR and CRP) were persistently high. Ultrasound of her right upper limb showed subcutaneous edema with no evidence of deep vein thrombosis and ultrasound of her abdomen revealed no evidence of focal lesions or masses.

She continued to deteriorate despite multiple courses of antibiotics. Her right elbow nodule became more prominent and increased in size. In addition, a few new erythematous and tender small nodules appeared in the posterior aspect of the distal third of her right forearm (Figure 1). Aspiration of the right elbow nodule produced only a small amount of serous fluid that was positive for acid fast bacilli (AFB). She was then started on anti-TB treatment for tuberculous cellulitis. She was referred to the respiratory team for co-management. Sputum for AFB direct smear and TB culture and blood for TB culture were negative.



**Figure 1.** Small nodules on the distal one third of the posterior right forearm and right elbow nodule

On day 8 of anti-TB treatment, her condition deteriorated. She had nosocomial pneumonia with septic shock. A repeat chest radiograph showed diffuse nodular opacities over both lung fields suggestive of active lung infection. She also started to have side effects from anti-TB treatment (ALT increased to 124 u/L from normal baseline level). Unfortunately, she succumbed to secondary bacterial infection.

## Discussion

CTB is infection of the skin by *Mycobacterium tuberculosis*. The mycobacterial invasion can be either through direct inoculation of the bacteria (exogenous) or through blood and lymphatic systems from a pre-existing primary focus (endogenous).<sup>4,6</sup>

The skin manifestations of CTB include papules, plaques, nodules, and chronic ulcers that may mimic other differential diagnoses of cutaneous lesions.<sup>6,7</sup> Occasionally, the initial presentation may resemble common bacterial infection of the skin such as cellulitis, in which standard antibiotic treatment is unsuccessful.

CTB diagnosis is rather difficult as the definitive diagnosis can only be made by isolating *M. tuberculosis* in culture media. However, the test sensitivity is often low and the result may take weeks to come back. The diagnosis will need a high index of suspicion and careful consideration of the clinical presentation and other supportive investigations such as skin biopsy and HPE.<sup>7</sup> AFB direct smear is helpful, but can only be detected in cases of high bacillary load in disseminating TB infections.<sup>8</sup>

In the case of our patient, she was initially treated for tenosynovitis, episodes of recurrent cellulitis, and thrombophlebitis that were not responding to the COX-2 inhibitor and multiple courses of antibiotics. The suspicious nodule in her right elbow that worsened later in her disease course, led to the suspicion tuberculous infection. The positive AFB result from the nodule aspiration showed that she had a high TB burden even though there were no other clinical manifestations of TB infection. The previous TB infection that was inadequately treated would possibly be the reason why the patient was re-infected. Obtaining a good and significant history is paramount in diagnosing CTB as the diagnosis is always difficult.

The current combination therapy for CTB allows the disease to be fully treated with a good prognosis provided the duration of treatment is adequate.<sup>9</sup> The treatment regimen is similar to that of systemic TB, which include intensive and maintenance phases.<sup>7</sup> However, factors for consideration prior to treatment initiation include the patient's overall general health condition, type of cutaneous involvement and the possible side effects of the treatment. Treatment adherence is very important to avoid drug resistance and to ensure treatment success.

## Conclusion

Clinicians should have a high index of suspicion of CTB infection in patients with recurrent cellulitis that is not responding to usual antibiotic treatment regardless of the premorbid status as CTB may resemble other skin diseases during the initial presentation.

## Conflict of Interest

The authors have no conflicts of interests to declare.

## Ethical Approval

This study was approved by the National Medical Research Register (NMRR) Malaysia with ID code: NMRR-20-3066-57769

## Authors' Contribution

Original draft preparation, writing and project administration – Abu Mansor Matardiah Nor Hashimah

Review, editing and supervision – Ai Lee Lim, Azman Ali Raymond.

All authors are contributed to the final version of this manuscript

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