

HOSTED BY



ELSEVIER

Available at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.elsevier.com/locate/IJMYCO](http://www.elsevier.com/locate/IJMYCO)

## Case Report

# A 7-year-old girl with multiple skin ulcers: Case report and literature review



Eman Sobh <sup>a,\*</sup>, Amira Bahour <sup>b</sup>, Sahar Elsayed <sup>c</sup>, Wegdan Amer <sup>b</sup>

<sup>a</sup> Department of Chest Diseases, Faculty of Medicine for Girls, Al-Azhar University, Cairo, Egypt

<sup>b</sup> Department of Pediatric Diseases, Abbassia Chest Hospital, Cairo, Egypt

<sup>c</sup> Department of Pathology, Abbassia Chest Hospital, Cairo, Egypt

## ARTICLE INFO

## Article history:

Received 10 June 2015

Received in revised form

25 June 2015

Accepted 28 June 2015

Available online 15 July 2015

## Keywords:

Cutaneous tuberculosis

Interferon-gamma release assays

Tuberculin skin test

## ABSTRACT

**Introduction:** There has been an increase in the number of tuberculosis (TB) cases worldwide, but TB of the skin remains rare.

**Case presentation:** A case of 7-year-old girl with multiple ulcerating nodules who presented with four ulcers in the skin of the left elbow. The patient was unresponsive to broad-spectrum antibiotics treatment initially. Because of poor clinical response to conventional therapy, TB was suspected. Although tuberculin skin test was negative, positive QuantiFERON TB Gold test and clinical picture strongly indicated TB. Clinical diagnosis was confirmed by positive culture for *Mycobacterium tuberculosis*.

**Conclusion:** A high index of clinical suspicion is necessary to suspect TB of the skin. Positive culture remains the gold standard for diagnosis.

© 2015 Asian African Society for Mycobacteriology. Production and hosting by Elsevier Ltd. All rights reserved.

## Introduction

Tuberculosis (TB) remains a major health problem worldwide. Globally, TB is the second leading cause of death from an infectious disease. There were 9 million new cases of TB in 2013 and 1.5 million TB-related deaths. Most of these TB cases and deaths are preventable if proper diagnosis and right treatment are provided [1]. In Egypt, the prevalence rate of TB is 27/100,000 and the incidence rate is 16/100,000 of the population [2]. Diagnosis of TB is usually based on a combination of symptoms, clinical presentation, radiological and pathological changes, bacteriological findings of acid/alcohol-fast bacilli,

and molecular tests. A definitive TB diagnosis is usually based on positive culture for *Mycobacterium tuberculosis* [3].

Although cutaneous TB is a rare form of extrapulmonary TB that accounts for only 1–2% of total TB cases [4], it is important to consider this form in a patient showing symptoms and signs suggestive of this condition.

Tuberculin skin test (TST) has been used as the diagnostic method to support the physician's decision process for many years. Interferon-gamma release assays (IGRAs) are more specific in diagnosing active TB. Although primarily developed for the diagnosis of latent TB, clinicians explored IGRAs for the immunodiagnosis of active TB [3].

\* Corresponding author at: Chest Department, Al-Zahraa University Hospital, 11517 Al-Abbassia, Cairo, Egypt.

E-mail address: [emansobh2012@gmail.com](mailto:emansobh2012@gmail.com) (E. Sobh).

Peer review under responsibility of Asian African Society for Mycobacteriology.

<http://dx.doi.org/10.1016/j.ijmyco.2015.06.007>

2212-5531/© 2015 Asian African Society for Mycobacteriology. Production and hosting by Elsevier Ltd. All rights reserved.

In 2010, the Centers for Diseases Control and Prevention updated their guidelines for testing TB infection, and concluded that IGRAs may replace TST in all situations in which they initially recommended TST as the tool for diagnosing *M. tuberculosis* infection [5].

### Case report

A 7-year-old female child, the fourth child in order, presented to us with skin ulcers. She received all vaccines including bacillus Calmette–Guérin (BCG). A review of her medical history indicated that her condition started 3 years ago with low-grade fever and toxic symptoms; multiple sinuses first on the scalp, then on the back, and finally on the left elbow joint. Initially, the lesions started as papules that progressed to nodules and pustules, eventually leading to draining sinuses. These were diagnosed as pyogenic abscesses, which were drained in the outpatient clinic or opened spontaneously and treated by antibiotics. There was no response to treatment with broad-spectrum antibiotics, and bacterial and fungal cultures from the discharging fluid were negative, and therefore, she was referred to our team of TB experts for consultation.

The patient presented with four ulcers in the skin of the left elbow, which were surrounded by edema and covered by unhealthy scar tissue. The ulcers were discharging purulent material. The patient experienced low-grade fever and loss of appetite and weight. She had a history of cough and expectoration 3 months previously, for which she did not seek medical advice. There was no history of contact with a TB patient and nothing was positive on systemic inquiry. A review of her family history indicated that her parents and four siblings were all alive and healthy. They were nonsmokers, nonaddicts, and belonged to a poor class.

On physical examination, the patient was alert, but pale and toxic and all vital signs were within normal limits, apart from temperature 38 °C; there was no lymphadenopathy, and systemic examination revealed no abnormalities. The patient was of average weight.

A left-arm examination revealed a BCG scar on the upper part. A cutaneous examination revealed discharging sinuses on the left elbow. The left elbow joint was also found to be swollen (Fig. 1). There was tenderness and difficulty in flexion/extension of the left elbow joint. An examination of her back revealed three ulcers, with the largest one measuring approximately 4 cm × 6 cm. The undermined edge of the ulcer was oozing serous fluid and was covered by crusty, irregular, pale granulation tissue (Fig. 2).

An examination of the respiratory system showed a decreased expansion in the upper chest. Auscultation revealed diminished breath sounds and bilateral infrascapular crepitation more on the right side. No significant finding was noted in the gastrointestinal, cardiovascular, and nervous systems.

Initial laboratory work up revealed normal blood glucose level, liver and kidney functions. A complete blood examination was performed, which indicated the following measurements: total leukocytes count, 9800/mm<sup>3</sup>; hemoglobin, 8 g/dL; erythrocyte sedimentation rate, 98 mm; and a microcytic



**Fig. 1 – The left elbow showing four ulcers discharging fluid and covered by granulation tissue.**

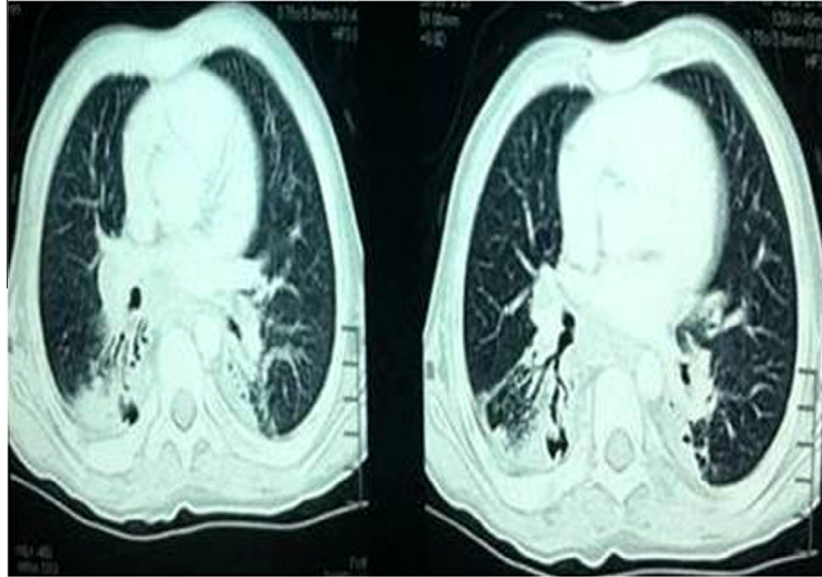


**Fig. 2 – Ulcers noted on the back.**

hypochromic blood picture. Urine and stool examination had no abnormal findings, and tuberculin test was negative. The sputum smear was negative for bacteria and acid-fast bacilli three times.

Culture from the discharging fluid of skin lesions was negative for bacteria, fungi, and acid-fast bacilli. Abdominal ultrasound findings were normal. Hepatitis B surface antigen, hepatitis C virus antibody, and human immunodeficiency virus screening results were also negative. In addition, all immunologic profiles were normal including CD3, CD4, CD8, and CD56. The patient then underwent QuantiFERON TB (QTB) Gold test, and its result was positive.

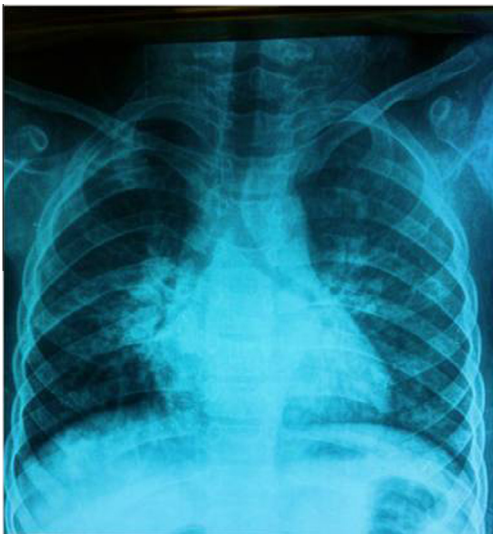
Chest X-ray showed nonhomogeneous shadowing in both lungs. A computed tomography of the chest showed areas of consolidation in both lungs (Fig. 3). An X-ray of the left elbow joint was normal. Unfortunately, skin biopsy was not performed due to refusal from the patient's mother.



**Fig. 3 – Chest computed tomography.**

Treatment was started depending on QTB Gold test, morphology and chronicity of skin lesions, and lack of response to broad-spectrum antibiotics.

A short-course chemotherapy for treatment of TB was started, which included first-line anti-TB drugs (isoniazid, rifampicin, pyrazinamide, ethambutol), in combination with pyridoxine for the first 2 months, and isoniazid and rifampicin for the continuation phase by directly observed treatment short course. The patient showed good response to treatment within 12 weeks (pulmonary and extrapulmonary lesions). Sputum culture was positive for *M. tuberculosis* and sensitive to the prescribed first-line anti-TB drugs. In addition, the skin swab culture from the discharging ulcer was positive for *M. tuberculosis*. The patient completed her 9-month treatment course. Marked improvements of the lesions were noted by the end of treatment (Figs. 4 and 5). Her contacts were screened for the mycobacterial infection and all were found to be free of the infection.



**Fig. 4 – X-ray after treatment.**



**Fig. 5 – Elbow ulcers after treatment.**

Written informed consent was obtained from the patient's father before submission of this manuscript.

## Discussion

Cutaneous TB can be acquired exogenously or endogenously; exogenous inoculation occurs after the direct inoculation of *M. tuberculosis* into the skin, whereas endogenous infection occurs in patients who were previously infected by lymphatic spread, hematogenous spread, or contiguous extension [6]. In our case, we think that the source of infection is hematogenous spread as the patient had pulmonary and skin lesions.

Swellings with draining sinuses, positive QTB test, and a good response to anti-TB treatment favored the diagnosis of TB in our patient. Initially, the clinical picture, morphology, chronicity of lesion, and poor response to antibiotics strongly favored the diagnosis of TB but the negative tuberculin result was disappointing. Because there were conflicting results (positive QTB with negative tuberculin), there was some debate between the experts in the diagnosing team. Extensive literature search about this topic revealed only

few cases. Regarding the TST-negative/QuantiFERON-TB Gold in-tube (QFT-GIT)-positive discordance, TST may have missed this tuberculous infection; by contrast, because of its high specificity for the *M. tuberculosis* infection, QFT-GIT identified this infection. Booster test of TST was not performed, which would have likely maximized the TST sensitivity [7]. Bartu et al. [8] reported 14 cases with TST-negative/QFT-GIT-positive results and concluded that the QFT test has higher sensitivity [8]; however, in our case, positive cultures for *Mycobacteria* supported the diagnosis of TB, and the good response to treatment provides sufficient evidence for our diagnosis.

---

### Conclusion

This case illustrates the importance of clinical suspicion, proper history evaluation, and confirmation of physical examination results with laboratory findings, followed by proper treatment with anti-TB agents, for adequate treatment of TB in suspected cases. There should always be a high index of suspicion of cutaneous TB infection in chronic discharging ulcers and resistant skin lesions. The role of IGRAs in active TB needs further evaluation.

---

### Conflicts of interest

All contributing authors declare no conflicts of interest.

---

### Acknowledgments

The authors thank Dr Magdy Fawzy Nasr Allah, MDR-TB Consultant and Research Coordinator for National

Tuberculosis Control Program, Egypt for his valuable support and continuous help throughout the course of treatment for this patient.

---

### REFERENCES

- [1] World Health Organization, WHO Global Tuberculosis Report 2014, Geneva, Switzerland, 2014, Available from: [http://www.who.int/tb/publications/global\\_report/en/](http://www.who.int/tb/publications/global_report/en/) [last accessed May 11, 2015].
- [2] World Health Organization, Tuberculosis Country Profiles, Geneva, Switzerland, 2013, Available from: <http://www.who.int/tb/country/data/profiles/en/> [last accessed June 24, 2015].
- [3] S.M. Vesenbeckh, N. Schönfeld, H. Mauch, et al, The use of interferon gamma release assays in the diagnosis of active tuberculosis, *Tuberc. Res. Treat.* 2012 (2012) 768723.
- [4] G. Sethuraman, V. Ramesh, Cutaneous tuberculosis in children, *Pediatr. Dermatol.* 30 (2013) 7–16.
- [5] G.H. Mazurek, J. Jereb, A. Vernon, et al, Updated guidelines for using interferon gamma release assays to detect *Mycobacterium tuberculosis* infection—United States, *MMWR Recomm. Rep.* 59 (2010) (2010) 1–25.
- [6] A. Frankel, C. Penrose, J. Emer, Cutaneous tuberculosis: a practical case report and review for the dermatologist, *J. Clin. Aesthet. Dermatol.* 2 (2009) 19–27.
- [7] F. Bartalesi, S. Vicidomini, D. Goletti, et al, QuantiFERON-TB Gold and the TST are both useful for latent tuberculosis infection screening in autoimmune diseases, *Eur. Respir. J.* 33 (2009) 586–593.
- [8] V. Bartu, M. Havelkova, E. Kopecka, QuantiFERON-TB Gold in the diagnosis of active tuberculosis, *J. Int. Med. Res.* 36 (2008) 434–437.