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Case Report

Bullous reaction to a Mantoux test; a case report and review of the literature

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ABSTRACT

The tuberculin skin test is widely used in the diagnosis of latent tuberculosis infection Blistering skin lesion from the test is rarely observed. In this manuscript, I report a patient who develops a bullous lesion from the test and I review the related literature.

Key words: Mantoux test; Skin test; Tuberculosis

INTRODUCTION

The tuberculin skin test (TST), (Mantoux test), is useful in detecting populations that have been in contact with the tuberculosis bacillus. Live bacteria are not used in the test so there is no chance of developing TB from the test. However, there are few rare reactions from the test. Swelling and redness of the arm, particularly in people who have had tuberculosis (T.B) or been infected previously and in those who have previously had the BCG vaccine, can occur. Anaphylactic reaction, foreign body reaction, regional lymphangitis and adenitis have all been reported.

Likewise bullous lesion from the test is a rare event.

Herein, We report a case that develops a bullous lesion from the test.

CASE REPORT

A 38-years housemaid Filipino female develop a 3 CM blister 1 day after TST (Fig. 1). The patient was tested because, she had progressive enlargement of the left cervical lymph nodes, (Fig. 2), for the last 3 months which were thought to be due to T.B.

The patient reported that she had generalized itching with excoriations all over the body two weeks before

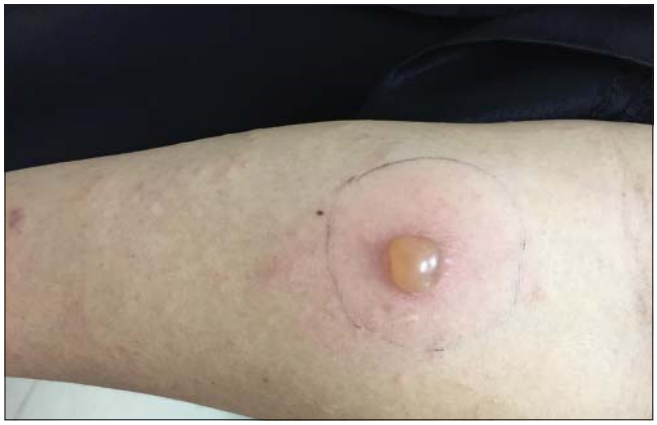

Figure 1: Large bullous lesion at the site of tuberculin test. Note that, the tiny excoriations of supposedly scabies lesions are just visible.

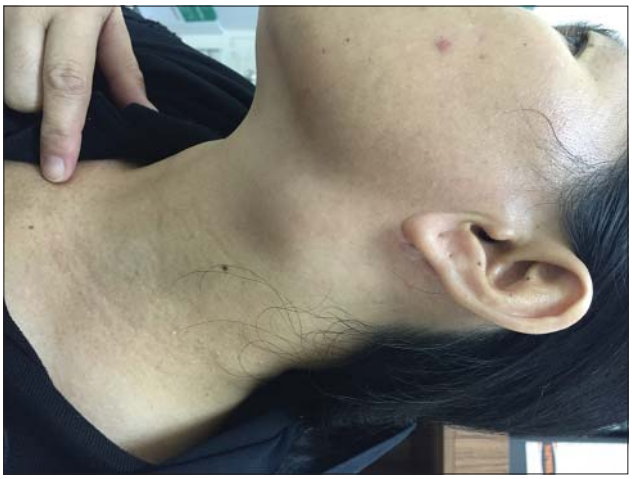

Figure 2: Enlarged cervical lymph nodes.

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the test. Her itchiness was diagnosed by a primary care physician as scabies but she does not know the names of the medications giving to her.

The tuberculin test done for her is 0.1 ml. The contents of which is shown in the Box 1. It is manufactured by BB-NCIPD Ltd., Sofia, Bulgaria.(Marketing authorization number 20000719).Batch NO 4750414. Expiray date 03.2016.

She has no history of cough, hemoptysis, or weight loss. The patient denied any family history of either tuberculosis or allergy.

General physical and systemic examinations were normal, except for single non-tender lymph nodes approximately 4x2 cm in the left side of the neck.

The generalized tiny skin excoriations were compatible with a healed scabies lesions, although skin scrapping failed to show any mites.

Erythrocyte sedimentation rate was 45 mm in the first hour.But, the hemogram, liver and kidney function tests, blood sugar and urine examination were normal. Venereal Disease Research Laboratory (VDRL) and enzyme linked immunosorbent assay (ELISA) for human immunodeficiency virus (HIV) were nonreactive. Chest radiograph did not show infiltration/adenopathy and abdominal ultrasound was normal.

A fine needle aspiration cytology of the left cervical lymph node, carried out later, confirmed evidence of granuloma and necrosis along with acid fast bacilli (AFB). She was diagnosed as tubercular lymphadenitis and started on antituberculous medications.

DISCUSSION

Intradermal tests can be done for the detection of delayed sensitivity to bacterial, fungal and viral antigens. TST is one of these test [1-12].

TST is important for the dermatologists because of an increasing incidence of tuberculosis associated with HIV infection, and also because screening is a necessary part of the work-up before use of antitumor necrosis factor biological drugs (for example, in psoriasis) [2]. Box 2, summarizes important facts about the test.

A positive test can result from clinical or latent tuberculosis infection, from BCG vaccination or from contact with environmental mycobacteria.

The results of this test must be interpreted carefully. The person's medical risk factors determine the size of induration the result is positive (5mm, 10mm, or 15mm). In Table 1, We listed some of the causes of false positive and false negative results.

Normally, a cut-off of 5mm induration is used to determine those at high risk of tuberculosis infection, for example close contacts of an active case, patients with radiographic abnormalities consistent with tuberculosis, those with HIV infection and those

Box 1: The contents of 0.1 skin test done to the patient

Tuberculin purified protein derivative (PPD) (Bioequivalent to 5 IU PPD-S)	5 TU
Tween 80 (as stabilizer)	5 microgram
Phenol (as preservative)	Less than or equal to 0.25 mg
Isotonic phosphate buffer	PH 6.5-7.5
Disodium hydrogen phosphate	0.76 mg
Potassium dihydrogen phosphate	0.145 mg
Sodium chloride	0.48 mg
Water for injection	q.s. 0.1 ml

Box 2: Some facts about TST

- It is given intradermally, on the left forearm as 0.1 ml and read after 48 to 72 hours
- Reading depends on the induration and not the erythema
- The induration is measured as (palpable raised, hardened area) across the forearm (perpendicular to the long axis) in millimeters. If there is no induration, the result should be recorded as "0 mm"
- The higher the risk a person has for developing active tuberculosis, the smaller the diameter criterion used for defining positivity in a tuberculin skin test result
- In case a second tuberculin test is necessary it should be carried out in the other arm to avoid hypersensitising the skin
- It is not specific for TB as PPD is a culture filtrate of tubercle bacilli containing over 200 antigens shared with bacille Calmette–Guérin (BCG) and many non-tuberculous mycobacterium
- For the reaction to be positive, 2 to 12 weeks need to have passed since the tuberculosis infection
- The Mantoux conversion is defined as a change (within a two-year period) of Mantoux reactivity whereas reversion is defined as the change to a negative Mantoux result following a previous positive result
- Giving a second TST after an initial negative TST reaction is called two-step testing. If the test is repeated, a larger reading may be obtained due to the immune response being 'recalled' or 'boosted' by the first test
- Boosting is maximal if the second test is placed between one and five weeks after the initial test, and it may continue to be observed for up to two years
- United States (US) recommends that tuberculin skin testing is not contraindicated for BCG - vaccinated persons, and prior BCG vaccination should not influence the interpretation of the test
- TST is not recommended in the following situations:
  Past Mantoux reactions ≥15 mm, previous TB disease, and Infants under 12 weeks old

Table 1: Causes of false results of PPD

False positive	False negative
• Non - tuberculosis mycobacterium or previous administration of BCG vaccine (BCG may result in a false - positive result for many years after vaccination) • Also when the injected area is touched, causing swelling and itching • Allergic reaction or hypersensitivity (It is advisable that epinephrine is available when giving the test)	Infectious mononucleosis, Sarcoidosis, Hodgkin's disease, Corticosteroid therapy/ Steroid use, Malnutrition, and HIV

immunosuppressed with corticosteroids or other agents. A cut-off of 10mm is used in immigrants from endemic areas, health care workers, the homeless and residents of some inner cities, and those patients with diabetes, renal disease, silicosis and other conditions associated with an increased risk of latent tuberculosis. Finally a cut-off of 15mm is used in those with no risk factors [2,11].

Because the test requires the patient to come to the hospital twice and because of its low specificity, new tests are being developed to replace TST.

The Food and drug administration FDA approved a novel diagnostic test (QuantiFERON-TB GOLD, made by Cellestis, Inc.) for TB. The blood test detects the presence of Mycobacterium tuberculosis (TB) infection by measuring interferon-gamma (IFN-G) harvested in plasma from whole blood incubated with the M. tuberculosis-specific antigens, ESAT-6 (QFT-RD1) and CFP-10 [2].

Reactions from TST are not common [5-12]. The formation of vesicles, bullae or necrosis at the test site indicates high degree of tuberculin sensitivity and thus presence of infection with tubercle bacilli.

To avoid severe skin necrosis, a tuberculin skin test should be avoided in patients with a history of severe reaction.

An exaggerated response causing giant reaction to tuberculin has been occasionally described in patients with lepromatous leprosy [11].

The case I reported has a tuberculous lympahadenitis. She developed a large bulla in just one day, which is not typical for the delayed hypersensitivity reaction seen with TST.

It is difficult to explain for sure the cause of this reaction. However, I think that her presumed scabies infestation facilitate this unusual reaction.

Eosinophils which are one of the important elements of type I hypersensitivity reaction are predominate in scabies and could have switched the reaction from Type IV to Type I or to an unusual Type IV reaction.

Scabies by itself is reported to present with bullous lesion [13].

This report may be a reminder to dermatologists to be involved actively in assessing tuberculin testing as they are the most expert physicians, in interpreting various skin changes associated with intradermal testing.

REFERENCES

1. Cox NH and Coulson IH. Diagnosis of Skin Disease. In: Rook's Textbook of Dermatology, 8th ed, Burns T, Breathnach S, Cox N, Griffiths C (Eds), Wiley-Blackwell, Oxford, UK 2010.5.1-5.26.
2. Yates VM. Mycobacterial infections. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. Rook's textbook of dermatology, 8th edn. Oxford: Wiley-Blackwell Ltd, 2010: p. 31.36–31.38.
3. Herrmann JL, Simonney N, Lagrange PH. [Advantages and drawbacks of in vitro Interferon-gamma/T cell assays compared to the Mantoux test for the diagnosis of tuberculosis]. Arch Pediatr. 2007;14:207-11.
4. Slim-Saidi L, Mehiri-Zeghal E, Ghariani A, Tritar F. [New diagnosis methods of tuberculosis]. Rev Pneumol Clin. 2015;71:110-21.
5. Al Aboud N. Eponyms in Tuberculosis. Our Dermatol Online. 2016; in press.
6. Kuramoto Y, Tagami H. Histopathologic pattern analysis of human intracutaneous tuberculin reaction. Am J Dermatopathol. 1989;11:329-37.
7. Föll M. [Reduction of excessive reactions after tuberculin skin test (mendel-mantoux method)]. Gesundheitswesen. 2002;64:544-7.
8. Avasthi R, Chaudhary SC, Mohant D. Giant mantoux reaction. Indian J Med Micro. 2009;27:78-9.
9. Bunnet D, Kerleguer A, Kim P, Pean P, Phuong V, Heng N, et al. Necrotic Tuberculin Skin (Mantoux) Test Reaction: A Case Report and an Estimation of Frequency. Chest. 2015;148:e1-4.
10. Lu CY, Lee PI, Chang LY, Chen CM, Huang LM. Picture of the month. Severe skin ulceration after tuberculin skin test. Arch Pediatr Adolesc Med. 2007;161:303-4.
11. Nayak S, Acharjya B. Mantoux test and its interpretation. Indian Dermatol Online J. 2012;3:2-6.
12. Nicolás-Sánchez FJ, Moreno-Arias G, Cabau-Rubies J. [Tuberculin skin test with an atypical blistering reaction]. Arch Bronconeumol. 2006;42:100.
13. Maan MA, Maan MS, Sohail AM, Arif M. Bullous scabies: a case report and review of the literature. BMC Res Notes. 2015;8:254.

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