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ORIGINAL ARTICLE

Primary Tuberculosis of Skin- A Nodular Variant Rare Case Report

GIRISH L DANDAGI*

ABSTRACT

Tuberculosis (TB) is familiar to human beings since the prehistoric ages. India has more tuberculosis patients than any other country has. In the year 2000 alone, an estimated 8.3 million new cases of TB has been noted in India. TB is an important public health problem in India, and considerable effort is being devoted to the diagnosis and management of this condition. An attempt is being made to lower the overall disease burden in the community. Delay in the diagnosis and treatment often prolong the infectious phase for these patients. Suboptimal treatment (Improper drug Regimens, poor adherence to treatment, drug availability, etc) often compounds this problem. An unusual case of tuberculosis of the skin on the lower chest wall was recently noted in our department, the diagnosis of which was made, based on the clinical symptoms, culture of the pus and on the histological examination of the skin. The lesion resolved in response to chemotherapy.

Key words: Tuberculosis, lymphatic spread, lymphadenitis, abscess formation

*MBBS, MD Assistant Professor, Department(s) and institution(s): Department of TB and Respiratory Medicine, Belgaum Institute of medical sciences, Belgaum, Karnataka, India

Corresponding Author:

Dr. Girish L Dandagi

MBBS, MD Assistant Professor

Plot no 49, sector # 9, Malmaruti Extn,
Belgaum-590016

Phone numbers: Mobile: 9449308081

Res: 08312456931

E-mail address: girishdandagi.2009@rediffmail.com

Introduction

Tuberculosis is one of the oldest diseases which is known to humankind and it continues to be a significant problem in the third millennium. Worldwide, it remains the leading cause of death as a single infectious disease [1], [2]. The factors which are responsible for the resurgence of tuberculosis in the low-endemicity countries of Europe and the US include the presence of HIV infection, immigration from areas of high prevalence of the disease, adverse social conditions, the development of multiresistant mycobacterium tuberculosis and the mostly ineffective control programmes for the high risk groups [3]. Extrapulmonary tuberculosis is of secondary importance from the public health perspective, because it is not contagious; nevertheless, it constitutes up to 40% of all the cases. Cutaneous tuberculosis is a rare condition

in countries with low endemicity of the disease, and thus presents a serious diagnostic challenge to the clinicians [4]. Cutaneous tuberculosis is usually caused by mycobacterium tuberculosis, mycobacterium bovis and rarely, Calmette-Guerin. The portals of the entry of the Tuberculosis bacteria are usually the lung, and in decreasing frequency, the tonsils and the intestines. Rarely is the skin or the mucous membranes the portals of entry for the tuberculosis bacteria. . Lymphatic spread to the regional lymph nodes and then to the blood stream occurs rapidly in the latter instance. Here is a rare case of primary cutaneous tuberculosis of the lower chest wall which is discussed and reviewed in detail.

Case History

A 30 year old Indian male patient consulted the Department of Respiratory Medicine for a painless swelling in the left lower chest wall. On general physical examination, he was found to be moderately built and poorly nourished. There were no other signs of thoracic or abdominal disease. On clinical examination, a 'T' shaped diffused swelling, measuring approximately 7x5cm in diameter, was noted on the left side of the lower chest wall, near the 10th and 11th rib region [Tab/Fig 1]. The surface of the swelling appeared shiny and hyperaemic. The swelling was nontender, nonpulsatile and soft in consistency and it was fluctuant. A single left axillary group of lymphnodes was enlarged and nontender. There was no history of trauma or foreign body impregnation. From the above history and clinical examination, a provisional diagnosis of inflammatory swelling was made and the patient was subjected for a course of antibiotics. Then, the patient revisited our department after 15 days when the swelling had ruptured and was completely ulcerated. The ulcer measured about 7x5cm with undermined edges and an indurated base. The base also showed sloughing. The skin surrounding the ulcer was hyperpigmented. A provisional diagnosis of tuberculous ulcer was made [Tab/Fig 2]. The other differential diagnoses which resemble tuberculous ulcer are atypical tuberculosis caused by *Mycobacterium* ulcers and *Mycobacterium marinum*, although cutaneous anthrax which is rare in tropical countries, cutaneous leishmaniasis, Spirotrichosis and cat scratch disease.

The diagnosis was ruled out on the basis of the history and the lack of oedema at the site of the ulcer. Then, for confirmation, the patient was subjected for chest radiography, which showed normal lung parenchyma with no rib erosion [Tab/Fig 3]. The tuberculin skin test was negative. Then, he was subjected to biopsy and culture. The histological picture [Tab/Fig 4] consisted of hyperkeratosis, hypergranulosis and acanthosis with tuberculoid granulomas showing a moderate amount of caseation necrosis. Few tubercle bacilli are seen in the mid-dermis. Marked fibrosis was also noted. The AFB culture was positive after 8 weeks. From the history and histological examination, a

confirmatory diagnosis of primary tuberculosis of the skin was made. The patient was put on DOTS category III treatment under RNTCP. The combination therapy of Rifampicin, INH, and Pyrazinamide was given. The patient was recalled after 6 months and a clinically completely healed ulcer was seen [Tab/Fig 5].



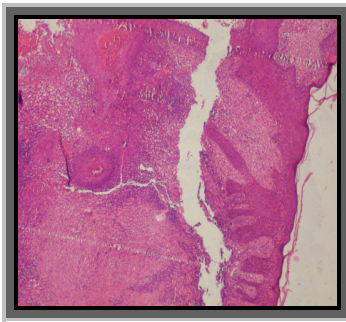
Table/Fig 1. "T" Shaped nodular swelling of left lower chest wall.



Table/Fig 2. Tuberculous ulcer of the skin



Table/Fig 3. Chest X-ray showing no evidence of pulmonary lesions.



Table/Fig 4. Histology of TB skin



Table/Fig 5. Healed Tuberculous ulcer after chemotherapy.

Discussion

Cutaneous tuberculosis poses a serious challenge to the clinicians, who must differentiate this condition from several other diseases of the skin

which present as papules, nodules or ulcers [5]. There are various alternative routes of spread of the tuberculous infection and the skin is potentially one of these [6]. The single skin lesion with regional lymphadenitis is characteristic of the primary complex, without the signs of lung involvement or the patent haematogenous dissemination of *Mycobacterium tuberculosis*. The negativity of the skin tuberculin reaction in a patient with no immune abnormalities, presenting with systemic constitutional signs of the disease, supports this hypothesis. Cutaneous tuberculosis may have very diverse clinical presentations [7], [8]. The initial presentation may resemble that of a common bacterial infection (which is usually related to small trauma). The antibiotics which target Gram-positive cocci exert no effect on the skin. Other mycobacteria have a specific tropism to the skin: *Mycobacterium ulcers* and *Mycobacterium marinum* produce painless ulcers with deep necrotic bases and satellite lesions, communicating with the original one. Diagnosis is made by histology, and the typing of the mycobacteria, which requires its isolation on culture. Cutaneous anthrax [5] can rarely occur in tropical countries or even in Western countries in professionals who are exposed to skin products. It presents as small, painless papules which progress to a vesicle with an erythematous and edematous base, become haemorrhagic, ulcerate and reveal a necrotic area. The typical lesion of cutaneous leishmaniasis begins as a papule at the site of the sandfly bite and slowly progresses to a nodule. A painless ulcer with violaceous border is noted. The diagnosis is made on histological grounds, although culturing of the organism is also tried. Spirotrichosis, an unusual fungal infection, starts as a small papule, which develops into a nodule, may ulcerate and has a chronic evolution; diagnosis is made by histology and culture. In the case of cat scratch disease [5] due to *Bartonella henselae*, the initial skin lesion is often inapparent and is dominated by regional lymphadenitis. The diagnosis is suspected on histological grounds and confirmed by serology. In the classification of cutaneous tuberculosis [Tab/Fig6], which was used by Kakakhel [9], [10] inoculation tuberculosis takes three forms, namely Tuberculosis chancre, warty

Tuberculosis (Nodular Tuberculosis, Tuberculosis verucosa cutis) and Lupus vulgaris

Table/fig 6 Classification of cutaneous tuberculosis.

Type Of Tuberculosis	Clinical Appearance
Inoculation tuberculosis (Exogenous source)	Tuberculosis chancre Warty tuberculosis Lupus vulgaris (some)
Secondary tuberculosis (Endogenous source)	Contiguous spread (scrofuloderma) Auto-inoculation (orofacial tuberculosis)
Hematogenous tuberculosis	Acute miliary tuberculosis Lupus vulgaris (some) Tuberculosis gumma
Eruptive tuberculosis	Lichen scrofulosorum Papular or papulonecrosis tuberculosis

Nodular Tuberculosis is the most common skin Tuberculosis in Asia, and it occurs from the inoculation of the organisms into the skin of a person who has a moderate- to high immunity from a previous infection or immunization [11]. While it tends to occur on the hands of the Europeans, the pattern in Asians consists of the involvement of the knees, ankles and the buttocks [11].

Sehgal et al [12] described the initial lesion as an asymptomatic small papule or papulopustule with an inflammatory areola that develops at the site of inoculation. It later becomes hyperkeratotic and warty and develops into a verucous plaque with a horny surface, with deep clefts and fissures. The plaque is usually firm, but later, areas of softness may occur, with pus and keratinous material being expressed from the fissures. Spontaneous involution may occur. More often, atrophic scars may result. Other forms that may include fungating granulomas and tumour like forms [13], [14], wart like forms, Psoriform plaques and keloidal forms. Sehgal and Kakakhel contend that regional lymphadenitis is rare and is often pyococcal.

In the diagnosis of TB, the detection of AFB (Acid fast bacilli) during microscopic examination of the sputum smears remains to be the most widely used investigation in clinical practice, especially in developing countries and in countries with a high prevalence [15], [16], [17]. The demonstration of tubercle bacilli in the

smears and/or tissue sections confirms the diagnosis, but a limitation, as shown in Sehgal's study, is the failure to detect the bacilli in 87% of the patients with lupus vulgaris and in about 50% of the patients with other variants of the disease [15]. Besides acid fast staining, Fluorescent staining with auramine or rhodamine is also available and is more sensitive. Most authors reported a difficulty in culturing mycobacterium or demonstrating the tubercle bacilli by histology. An immunological diagnosis may be established by the tuberculin test and by ELISA assays for the antibody to the M.tuberculosis antigen [Tab/Fig 7].

Table/fig 7 criteria of diagnosing cutaneous tuberculosis

Criteria	Methods of Diagnosis
Absolute criteria	- culture - guinea pig inoculation
Relative criteria	- history and signs - presence of active proven tuberculosis elsewhere in the body - presence of acid-fast bacilli in the lesion - histopathology - positive reaction to tuberculin - effect of specific therapy

Conclusion

In contrast to other types of diseases which remain confined to the skin, primary tuberculosis has the potential to evolve as a systemic disease and the prognosis is serious in the absence of accurate diagnosis and specific therapy. The clinical history may not help at all. The patient whom we described here, had given little attention to the nodule and the reason for consultation was indeed the occurrence of the constitutional signs of tuberculosis. TB is an important public health problem in India, and considerable effort is being devoted to the diagnosis and management of this condition. An attempt is being made to lower the overall disease burden in the community.

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