

Case Report

Rare Case of Pulmonary Tuberculosis with Hematogenous Spread to Larynx and Skin

MĂDĂLINA OLTEANU¹, M.R. POPESCU¹, MIMI NITU²,
CRISTINA CALARASU³, A.V. MACESEANU³, M. OLTEANU²

¹University of Medicine and Pharmacy of Craiova, Faculty of Dentistry

²University of Medicine and Pharmacy of Craiova, Pneumology Department

³"Victor Babeș" Hospital of Infectious Diseases and Pneumology, Craiova

ABSTRACT: Introduction: Tuberculosis is an infectious disease with various clinical and radiological symptoms which are determined primarily by the immune system of the host towards the infection with *Mycobacterium tuberculosis*. The infection with *M. tuberculosis* can be limited to an organ or it can spread through hematogenous or lymphatic route to other organs (especially cases of younger or older people). Tuberculosis always needs bacteriological or histopathological confirmation. **Material and method:** We present the case of a 62 year old woman investigated and treated in our Hospital in 2009-2010 for Pulmonary tuberculosis complicated with Laryngeal Tuberculosis and Skin Tuberculosis (confirmed by histopathological exams). We intend to focus our case report on the cutaneous form of tuberculosis because of its rareness and clinical interest. **Conclusions:** Cutaneous tuberculosis is a very rare form of extrapulmonary tuberculosis and can be highly variable in its clinical appearance, significance and prognosis. Lesions of the skin are a real challenge for dermatologists. The treatment of cutaneous tuberculosis in most cases is the same as for pulmonary tuberculosis leading to regression and healing of the skin lesions.

KEYWORDS: cutaneous tuberculosis, hematogenous spread, histopathological exam

Introduction

Tuberculosis (TB), which may involve most organs, is still a major health problem in worldwide, especially in developing countries. With the advent of the HIV epidemic, the increased use of immunosuppressive therapy, the emergence of resistant strains of *M. tuberculosis*, the ease of migration of people, the decline in some countries of tuberculosis (TB) control efforts and the increasing rates of poverty and malnutrition, all forms of tuberculosis have reemerged.[1]

Within this context an increase in the incidence of cutaneous tuberculosis, which had nearly disappeared in the past, has been observed. Cutaneous tuberculosis (CT) is a rare manifestation of tuberculosis even in its period of highest incidence. CT comprises only a small proportion (<2%) of all cases of TB with the highest incidence being encountered in resource-poor countries. The disease is often initially mismanaged. [2, 3]

Mycobacterium tuberculosis, *Mycobacterium bovis* and the Bacille Calmette-Guérin vaccine can cause tuberculosis involving the skin. Cutaneous tuberculosis presents a wide variety of morphological forms depending on the invasion way of the *M. tuberculosis*, bacterial virulence and the cell-mediated a high and increasing frequency of TB. [4, 5]

Cutaneous tuberculosis may have various clinical forms. The infection mechanisms of CT are direct inoculation, local invasion, or hematogenous dissemination, and these infections are classified as multibacillary and paucibacillary based on bacterial load. [6] (Table 1) This system is extremely similar to Ridley and Jopling's description of *Mycobacterium leprae* in Hansen's disease. In the multibacillary forms, a plethora of mycobacteria can easily be identified on histological examination utilizing the Ziehl-Neelsen staining (AFB) method and culture. In the paucibacillary forms, sparse bacilli are seen on histological examination and culture isolation of mycobacteria is the exception rather than the rule. [7, 8].

Table 1. Multibacillary and paucibacillary classification of cutaneous tuberculosis (reproduced after Tigoulet et al) [1, 9]

MULTIBACILLARY	PAUCIBACILLARY
Tuberculous chancre, Scrofuloderma, Tuberculosis orificialis, Acute miliary tuberculosis, Gummatous tuberculosis	Tuberculosis verrucosa cutis, Lupus vulgaris, Tuberculids Erythema induratum of Bazin Lichen scrofulosorum

As knowledge of the disease increased, it became apparent that although lesions appeared clinically similar, their development, progression, and prognosis were different. Tappeiner and Wolff proposed the most widely accepted classification based on the route of infection:

exogenous: tubercular chancre, tuberculosis verrucosa cutis, lupus vulgaris

endogenous: contiguous (scrofuloderma, orificial tuberculosis), hematogenous (acute milliary tuberculosis, metastatic tuberculosis abscess - gumma, papulonecrotic tuberculid, lupus vulgaris), lymphatic (lupus vulgaris) [5]

The most frequent form of CT is lupus vulgaris (LV) [4]. Lesions usually are small, solitary, nodular, sharply defined, reddish-brown lesions with a gelatinous consistency (called apple-jelly nodules) on the head and neck of individuals in Western countries while those individuals in tropical and subtropical areas present with lesions on the lower extremities or buttocks. [5]

Scrofuloderma and lupus vulgaris are frequently seen in immunodepressed patients and tuberculosis verrucosa cutis is more common in immunocompetent patients.

Early diagnosis and treatment of patients with CT is extremely important in order to prevent complications. [7, 8]

Materials and methods

A 62 year old woman with history of maxillary sinusitis, thrombocytosis and anemia was admitted in Otolaryngology Department in 2009 for chronic dysphonia. Direct laryngoscopy evidenced inflammatory and erosive lesions on both epiglottis and vocal cords. Biopsies were performed and histopathological exam revealed epithelioid cell granulomas with Langhan's giant type cells suggestive for tuberculosis. She was transferred to our pneumophtisiology department for proper treatment and further investigations.

During clinical history taking she revealed that she has chronic cough with intermittent sputum production associated to chronic dysphonia and a relative deterioration of health in the last year.

On physical examination she had pale and sweated skin, nasal obstruction with mucous secretions, with reddish brown particular plaques and small scaring lesions on her nose that seemed to be extending to the cheeks. She also had rough bronchial sounds and

tachycardia, but normal blood pressure. The rest of the physical exam was normal.

Her lab investigations revealed mild anemia (Haemoglobin level =9.4 g/dl) thrombocytosis (Platelets = 840.000/mm³) with normal differential count and very high sedimentation rate 115 mm/1h - 130mm/2h.

Chest X-ray evidenced low density small nodular opacities on both areas of the lungs (Fig.1).



Fig.1. First admission chest X-ray- low density small nodular opacities on both areas of the lungs

Sputum smears were positive for Acid Fast Bacilli. Cultures confirmed *Mycobacterium tuberculosis* in sputum smears.

Dermatological exam suspected Lupus vulgaris and biopsy of the noses' skin lesions was recommended.

The skin biopsies evidenced epithelioid cells and giant Langhans cells surrounded by many monocytes and lymphocytes confirming the diagnosis of Cutaneous tuberculosis (Lupus vulgaris type).

Corroborating clinical data with specific laboratory tests and biopsies the diagnosis was Pulmonary tuberculosis with hematogenous spread (lungs, larynx and skin) confirmed by bacteriological (sputum smears) and histopathological exams (laryngeal and skin

biopsies). Chronic maxillary sinusitis. Sinus tachycardia. Mild anemia.

Standard treatment for tuberculosis with first regimen of treatment regimen of antimycobacterial drugs according to National Tuberculosis Control Program using weight adjusted dose of HRZE 7/7 for 3 months then HR 3/7 for 5 months.

Control of the sputum smears revealed positive results for cultures up to three months after the initiation of treatment so her treatment was extended with 2 months. Cultures were negative after 4 months of treatment, initial radiologic findings disappeared and all skin lesions healed at the end of the treatment. Patient gained weight and was no more dysphonic.

Discussions

Tuberculosis is an important public health problem in Romania noticing in the last years a considerable increase of the incidence of extrapulmonary tuberculosis due to infection with HIV in which immunodeficiency allows reactivation of previous tuberculosis, or acquisition of new infection with *M. tuberculosis*, too.[4]

Our diagnosis of Skin tuberculosis (*Lupus vulgaris*) was made based on clinical and histopathological examination.

Cutaneous tuberculosis represents a small percent of total extrapulmonary TB forms, caused mainly by *Mycobacterium tuberculosis*. Skin tuberculosis can be also highly variable in its clinical appearance, significance and prognosis. The form of the disease depends on the virulence of the strain, the immune status of the host, the portal of entry, the mode of internal spread, and the adequacy of initial treatment. Lesions of the skin often represent hematogenous or lymphatical dispersed disease from internal foci of infection. Early diagnosis and treatment of patients with CT is extremely important in order to prevent complications.

Cutaneous TB must be considered differential for all skin lesions especially if we investigate an immunocompromised patient with pulmonary tuberculosis using clinical findings and histopathological exam of biopsy samples. In this particular case leprosy could have been another differential diagnosis but in our country leprosy is almost eradicated (last reported case was in 1977).

Leprosy (also known as Hansen's Disease) is a chronic, granulomatous, infectious disease,

caused by *Mycobacterium leprae*, involving primarily the peripheral nerves and secondary the skin, mucosa and the eyes and the nose of infected individuals leading to chronic infections, blinding and important scars and amputations of different parts of the limbs.

Considering the results of skin tests (biopsies, and secretions tests) leprosy can be classified also in: paucibacillary - few or absent bacilli (tuberculoid leprosy, and borderline tuberculoid leprosy) and multibacillary - numerous bacilli (lepromatous leprosy, borderline lepromatous leprosy and borderline leprosy). Early multi-drug treatment for leprosy prevents major disabilities and scarring.

Conclusions

Cutaneous tuberculosis is a rare form of extrapulmonary tuberculosis. CT must be considered in cases with chronic skin lesions because tuberculosis prevalence is high in our country.

Positive diagnosis is based on histopathological examination of the skin biopsy sample. For the diagnosis and treatment of hematogenous spread tuberculosis we need close interdisciplinary collaboration between different specialties in our case involving microbiologist, pathologist, radiologist, pulmonologist and dermatologist.

The treatment of cutaneous tuberculosis in most cases is the same as for pulmonary tuberculosis. The duration of treatment can be extended to 8 - 12 months depending on tuberculous lesions resorption and the results of microbiological exams of the sputum. Some forms of skin TB require topical corticosteroid treatment.

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References

1. Ramos-e-Silva M, Ribeiro de Castro MC. Cutaneous tuberculosis. In: Bologna J, Jorizzo J, Rapini R, editors. Dermatology. London UK: Elsevier-Mosby; 2003. p. 1152.
2. Bravo F, Gotuzzo E. Cutaneous tuberculosis. Clin Dermatol 2007;25:173-80
3. Rita Semaan, Rana Traboulsi, Souha Kanj, Primary *Mycobacterium tuberculosis* complex cutaneous infection: report of two cases and literature review International Journal of Infectious Diseases (2008) 12, 472-477
4. A. Oanta, M. Irimie. Tuberculoză cutanată din nou în actualitate, DermatoVenerol. 2007 (Buc.), 52: 119-127

5. Amylynne Frankel, Carolin Penrose, Jason Emer, J Clin Aesthetic Dermatol. 2009;2(10):19–27
6. Gulisano G, Mariani L. Cutaneous tuberculosis: a rare presentation in an immigrant. J Travel Med 1998;5:131-134
7. Tutanc M, Arica V, Basarslan F, Dogramaci AC, Ozgur T, Akcora B. The youngest patient of lupus vulgaris; A cutaneous tuberculosis case report. Pak J Med Sci 2012;28(3):533-535
8. Bravo FG, Gotuzzo E. Cutaneous tuberculosis. Clin Dermatol. 2007;25(2):173–18
9. Tigoulet F, Fournier V, Caumes E. Formes Clinique de la tuberculose cutanee. Bull Soc Pathol Exot 2003; 96:362-7.

Corresponding Author: Mimi Nitu, MD PhD, University of Medicine and Pharmacy, Craiova, Pneumology Department , “Victor Babeș” Hospital of Infectious Diseases and Pneumology, Craiova, Calea București, No. 126, Craiova, Romania; e-mail: dr_nitumimi@yahoo.com