Lichen scrofulosorum in a Saudi adolescent with multifocal tuberculosis

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Lichen scrofulosorum (LS) is a rare form of cutaneous tuberculosis (TB) that affects children and young adults.¹ It is ascribed to hematogenous spread of *Mycobacteria* in an individual strongly sensitive to *Mycobacterium tuberculosis*.² The skin lesions are typically symptomless papular eruptions, associated with a strong Mantoux reaction or with TB of the lymph nodes and/or other organs.³ The response to anti-TB therapy is usually striking. The objective of this paper is to report LS for the first time in Saudi Arabia. It is an exceptionally rare type of cutaneous tuberculosis, and this account emphasizes the importance of excluding underlying systemic TB.

CASE

A 13-year-old, previously healthy Saudi Arabian adolescent male was hospitalized in a tertiary care hospital for investigation of a persistent non-itchy skin rash for one month associated with mild non-productive cough. He reported anorexia and had lost 7 kilograms body weight over the preceding four months; however his illness did not affect his performance at school. There were no musculoskeletal, gastrointestinal, or ophthalmologic symptoms. He had no recent travel and no known exposure to animals. He had received Bacille Calmette-Guérin (BCG) vaccination as a neonate and other vaccinations were up-to-date. The patient's mother had been treated for pulmonary tuberculosis three years earlier. Clinical examination revealed a pale, malnourished patient with a body weight of 33 kilograms and a height of 150 centimeters. He had fever of unknown origin (FUO). Skin examination revealed discrete symmetrical red-brown papules (5 to 10 mm) on the trunk and proximal limbs, some of which were crusted and covered by whitish scales (Figure 1). The face, mucous membranes and genitalia were not involved. There were non-tender and discrete cervical and inguinal lymphadenopathies less than 2 centimeters in size. The remainder of a full systematic

examination was unremarkable. Laboratory investigations revealed a leukocyte count of $8.7 \times 10^9/\text{dL}$, hemoglobin 10 g/dL, platelets of $254 \times 10^9/\text{L}$, erythrocyte sedimentation rate 60 mm, albumin 31 g/L, alkaline phosphatase 732 U/L (normal range, 98 to 279 U/L). The liver enzymes and renal function tests were normal. The patient was tested for HIV, hepatitis B and C and found to be non-reactive. Serology for Epstein-Barr virus IgG antibody was positive, while cytomegalovirus and varicella-zoster antibodies were negative; antinuclear antibody and rheumatoid factor tests were also negative. Multiple cultures of induced sputum were negative for *M. tuberculosis*. Blood cultures were sterile. A purified protein derivative (PPD) tuberculin skin test with 5 units was negative. A radiograph of the chest showed a widened mediastinum, and a CT of the chest revealed a grossly enlarged bilateral paratracheal, pretracheal, and mediastinal lymphadenopathy (Figure 2). Abdominal CT showed bulky, poorly enhancing porta hepatis lymphadenopathy with moderately en-

Figure 1. Lateral view of the lower chest and upper abdomen showing discrete red-brown papules, some of which are crusted and scaly.

Figure 2. Contrast-enhanced axial CT of the chest at the level of the aortic arch reveals enlarged paratracheal (P), and mediastinal (M) lymphadenopathy.

Figure 3. A) Low power: Skin tissue with dermal infiltration by epithelioid granuloma (arrow). B) High power: Central area of collagen necrosis (long arrow) rimmed by proliferating epithelioid histiocytes with a few giant cells (short arrow).

larged para-aortic lymph nodes.

Within 48 hours of hospitalization, the patient developed intermittent fever of 38.5°C to 39°C with increasing intensity of the rash. Skin biopsy showed dermal granulomatous inflammation with collagen necrosis. Alcian blue showed positivity within the center of the granuloma. Ziehl-Neelsen, periodic acid-Schiff and Gomori methenamine-silver stains were negative (Figure 3a, b). Bone marrow examination revealed a hypercellular reactive marrow with prominent plasma cells, but no evidence of lymphomatous or granulomatous infiltration. Stains and cultures for mycobacteria and fungal pathogens were negative. Biopsies from the cervical and inguinal lymph nodes revealed reactive hyperplasia. The patient underwent mediastinoscopic lymph node biopsy. Histopathology showed many epithelioid cell granulomas, some of which showed central necrosis. Stains for mycobacteria and fungi were negative.

One month after hospitalization, a presumptive diagnosis of multifocal TB was reached and the patient was started on combination antituberculous therapy (ATT) for 9 months. Four weeks into therapy, mycobacterial culture of mediastinal lymph nodes grew *M. tuberculosis*. The patient's fever subsided a few days after starting ATT and he was discharged home. At the outpatient follow-up visit after 8 weeks on therapy he showed remarkable weight gain (7 kilograms) and gradual resolution of the rash with no residual skin changes or scarring (Figure 4). A follow-up CT of the chest and abdomen 2 months after discontinuation of therapy showed a significant reduction in number and size of lymphadenopathy. The patient continued to do well 4 years later when he was evaluated for military service with no evidence of disease recurrence.

DISCUSSION

TB is a worldwide pandemic.⁴ In 2007, the World Health Organization (WHO) estimated that 8.8 million new TB cases occurred in 2005, including 7.4 million in Asia and sub-Saharan Africa.⁴ Extrapulmonary TB constitutes 15% to 20% of all cases of TB in immunocompetent patients and >50% of the cases in HIV-positive individuals.⁵

The association of cutaneous disease with mycobacterial infection has been recognized for over one and a half centuries.⁶ TB of the skin is an uncommon reason for a dermatology outpatient visit.^{7,8} In a study from India, a total of 0.02% (37/152 000) of patients attending a dermatology center had cutaneous tuberculosis over a period of 5 years.⁷ In another study from Spain, in 10 304 patients seen in the department of dermatol-

ogy from 1980 through 1993, 651 patients were diagnosed with different types of tuberculosis; 16 had skin involvement so that cutaneous TB represented 2.4% of all types of TB and 0.15% of all dermatologic cases seen during that period.⁸ Cutaneous TB has a worldwide distribution; it is not uncommon in India, Southeast Asia and South Africa while in Europe and North America, the incidence has shown a steady decline over recent decades.² It accounts for 0.1% of dermatology patients.⁹

Appropriate classification of skin TB is important because some variants may be associated with systemic involvement and with its implications for management and prognosis. Classification of cutaneous TB is based on the presence or absence of previous immunity and the mode of infection. A proposed classification based on pathophysiologic descriptions and prognostic information includes inoculation from exogenous source, spread from endogenous focus (contiguous spread), or hematogenous spread.⁶ In addition, there are a group of eruptions, the tuberculids, which are pathogenically less well understood and have been considered hypersensitivity reactions to occult internal focus of tuberculosis in which *M tuberculosis* could not be identified in such lesions.¹ In individuals who have never been exposed/sensitized to *M tuberculosis*, miliary TB of the skin and tuberculous chancre have been described while previously sensitized hosts develop lupus vulgaris, scrofuloderma, or tuberculosis verrucosa cutis.⁵ In a report from India of 402 patients that described the pattern of childhood TB, Kumar et al found that 53.3% had scrofuloderma, 40% had lupus vulgaris, 4% had tuberculosis verrucosa cutis, and 1.3% each had tuberculid and tubercular gumma.¹⁰

The causative mycobacteria of skin TB are *M tuberculosis*, *M bovis* and the BCG strain, an attenuated strain of *M bovis*. Tuberculids are due to hematogenous dissemination of mycobacteria in a host with a moderate to high degree of immunity against *M tuberculosis*.¹ These lesions include erythema induratum of Bazin, papulonecrotic tuberculid, LS, and others.¹ Tuberculids are now rare in the West, but are not uncommon in developing countries.¹¹ LS is a rare form of tuberculid usually seen in children and young adults with TB. The disorder was first recognized by Hebra in 1868,¹² and was uncommon even in the past. It is caused by hematogenous dissemination of mycobacteria in individuals possessing a moderate to high immunity in which the bacilli are rapidly destroyed in the skin and are difficult to demonstrate by smear.¹³

LS presents as asymptomatic lichenoid lesions confined to the trunk and consisting of small, firm follicular or perifollicular papules of a yellowish or pink color, with flat tops that are covered by fine scales. Lichenoid

Figure 4. Complete resolution of skin rash with no scarring.

grouping results in the formation of rough discoid plaques that tend to coalesce. The lesions persist for months but spontaneous involution eventually ensues. Histopathology reveals superficial tuberculoid granulomas developing around the hair follicles, but granulomas may occur independent of the adnexae. Mycobacteria are not seen and cannot be cultured from the biopsy material.^{1,2} Patients with LS usually have a positive tuberculin reaction and concurrent tuberculous involvement of lymph nodes, bones or other organs.¹ At times, other forms of cutaneous TB may be present concomitantly in the patient with LS, such as lupus vulgaris, tuberculous dactylitis, tuberculous gumma, tuberculosis verrucosa cutis, and erythema induratum.¹²

ATT results in complete resolution within a matter of weeks.¹³ In a study of 39 patients with LS that were followed prospectively during the period January 1996 to December 2002, Singal¹² found that 72% had an associated focus of TB elsewhere in the body, 33% had TB lymphadenitis, 28% had pulmonary TB, and 15% had other cutaneous TB while 8% had intracranial TB. The trunk was the commonest affected site (100%). All patients responded to ATT. Our patient had a skin eruption that was clinically compatible with LS and that was associated with tuberculous mediastinal and abdominal lymphadenopathy. The negative tuberculin skin test was thought to be due to malnutrition.

In conclusion, LS is an uncommon but still recognized entity of tuberculids, particularly in the developing world. It is commonly associated with a tuberculous focus elsewhere. A high index of suspicion is required in evaluating patients with possible cutaneous TB, and appropriate cultures must be obtained to establish the diagnosis.

REFERENCES

1. Thami GP, Kaur S, Kanwar AJ, Mohan H. Lichen Scrofulosorum: A rare Manifestation of a Common Disease. *Pediatr Dermatol*, 2002; 19:122-126.
2. Tappeiner G, Wolff K. Tuberculosis and other mycobacterial infections. In: Fitzpatrick TB, Eisen AZ, Wolff K, Freedberg IM, Austen KF. *Dermatol in General Medicine*, 4th edn, McGraw-Hill, New York, 1999; 2274-2292.
3. Beena KR, Ramesh V, Mukherjee A. Lichen scrofulosorum-A series of eight cases. *Dermatology* 2000; 201: 272-274.
4. Global tuberculosis control: surveillance, planning, financing. WHO report 2007. Geneva, World Health Organization (WHO/HTM/TB/2007.376).
5. Sharma SK, Mohan A. Extrapulmonary Tuberculosis. *Indian J Med Res*; 2004; 120: 316-353.
6. Beyt Jr BE, Ortbals DW, Santa Cruz DJ, Kobayashi GS, Eisen AZ, Medoff J. Cutaneous Mycobacteriosis: Analysis of 34 cases with a new classification of the disease. *Medicine* 1980; 60: 95-109.
7. Arora Wg Cdr S, Arora Dr G, Kakkar Col S. Cutaneous Tuberculosis: A clinico-morphological study. *Medical Journal Armed Forces India* 2006; 62: 344-347.
8. Farina M. del Carmen, Gegundez MI, Pique E, Esteban J, Martin L, Requena L, Barat A, Guerrero MF. Cutaneous tuberculosis: A clinical, histopathologic, and bacteriologic study; *J Am Acad Dermatol* 1995; 33: 433-440.
9. Kumar B, Muralihar S. Cutaneous tuberculosis: a twenty-year prospective study. *Int J Tuberc Lung Dis* 1999; 3: 494-500.
10. McKee PH. Infectious Diseases: Tuberculous. In: *Pathology of the Skin with Clinical Correlations*, 2nd edn, Mosby-Wolfe, London, 1996; 4.1-4.91.
11. Singal A, Battacharya S N. Lichen scrofulosorum: A prospective study of 39 patients. *International journal of Dermatology* 2005; 44: 489-493.
12. Antonio T, Valverde E, Mediero IG, Zambrano A. Lichen Scrofulosorum; *Pediatr Dermatol* 2000; 17: 373-376.
13. Smith NP, Ryan TJ, Sanderson KV, Sarkany I. Lichen Scrofulosorum; A report of four cases. *Br J Dermatol* 1976; 94: 319-325.