Bacillus Calmette-Guérin vaccine–induced lupus vulgaris in a child

N. M. Najem, V. B. Zadeh, A. H. Al-Abdulrazzaq, S. R. Al-Otaibi, R. S. Kadyan and M. Joneja

SUMMARY

Lupus vulgaris (LV) is a rare form of cutaneous mycobacterial infection in children. Most cases follow hematogenous or lymphatic seeding, and more rarely from exposure to bacillus Calmette-Guérin (BCG) vaccine. We report a child that received BCG vaccination and developed LV 2 months later.

KEY WORDS

BCG, lupus vulgaris, tuberculosis

Introduction

Although lupus vulgaris (LV) is nearly the most common form of cutaneous tuberculosis encountered in adults, it is rare in children (1–3). Bacillus Calmette-Guérin (BCG) vaccine–induced LV is even rarer. Its risk is estimated at 5/1,000,000 or 1/100,000 to 175,000 (4). We present a child that developed LV after BCG vaccination.

Case report

A 9-year-old girl presented with a 2-month history of an asymptomatic skin lesion on her left arm that slowly increased in size. She had received BCG vaccination 2 months earlier. Examination revealed multiple sharply marginated reddish-brown nodules of gelatinous consistency with central atrophy and two small superficial ulcerations (Fig. 1). On diascopy they appeared as small soft yellow-brown nodules (apple-jelly nodules). Her full blood count and blood

Fig. 1. Multiple sharply marginated reddish-brown nodules of gelatinous consistency with central atrophy and two small ulcers.

biochemistry studies were normal. Her chest X-ray was also normal. Urine and stool exams showed no abnormality. The tuberculin skin test was highly positive. Histopathological examination revealed upper and mid-dermal diffuse granulomas formed mainly of histiocytes, lymphocytes, and multinucleated giant cells, with central areas of caseation (Figs. 2, 3). They were negative for Ziehl-Neelsen stain (Figs. 4, 5).

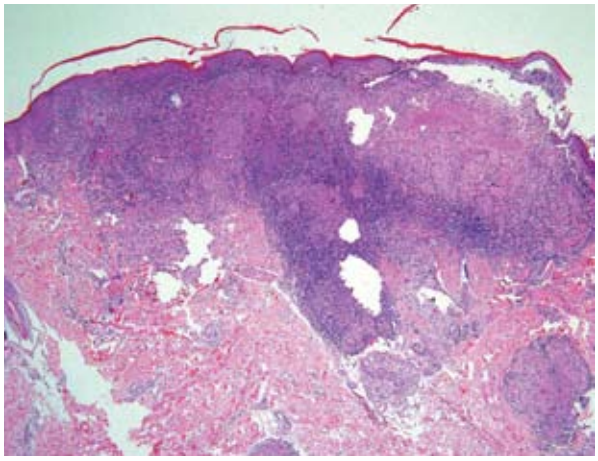

Fig. 2. Upper and mid-dermal granulomas, hematoxylin and eosin, ×40.

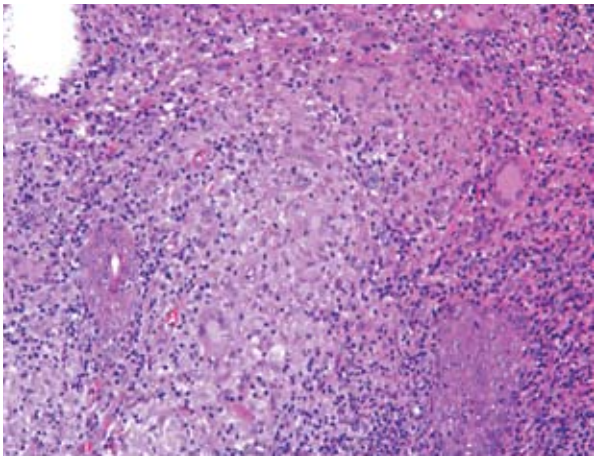

Fig. 3. The infiltrate is mainly formed of histiocytes, lymphocytes, and multinucleated giant cells, hematoxylin and eosin, ×400.

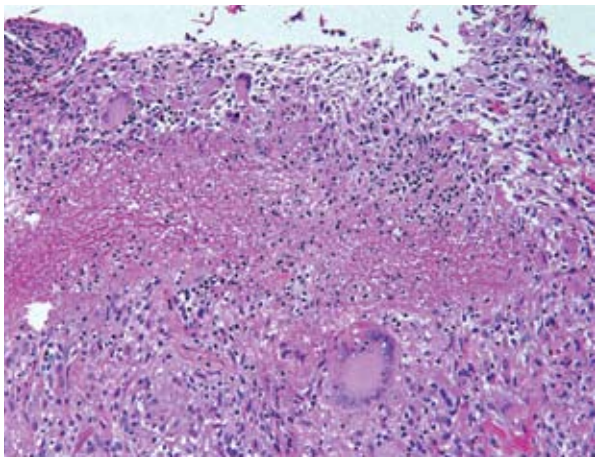

Fig. 4. Central areas of caseation and multinucleated Langhans giant cell, hematoxylin and eosin, ×400.

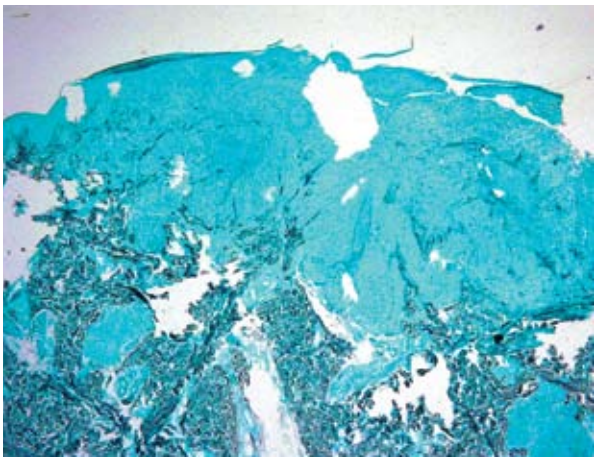

Fig. 5. Ziehl-Neelsen stain is negative for tubercle bacilli, ×40.

Discussion

Lupus vulgaris, scrofuloderma, and tuberculosis verrucosa cutis constitute most cases of cutaneous tuberculosis. In published series from India and South Africa, lupus vulgaris was the most common form of cutaneous tuberculosis in adults and the second-most prevalent after scrofuloderma in a series from the UK (1–3). Although lupus vulgaris is the best-known form of cutaneous tuberculosis, it is rare in children (5).

Most cases of LV follow hematogenous or lymphatic seeding, but in rare occasions it may occur as a complication of BCG vaccination (6). About 60 cases of BCG-induced LV have been reported in the literature and the estimated incidence is only 5 per million vaccinations (4, 7).

Bacillus Calmette-Guérin is a live vaccine prepared from an attenuated strain of Mycobacterium bovis, developed in 1908. While generally safe, cutaneous complications of the vaccine are well

recognized and may include local hypersensitivity reactions, cutaneous granulomas, and fixed drug eruption, in addition to LV (8).

The World Health Organization currently recommends that the BCG vaccine be administered to all people living in tuberculosis-endemic areas. It is included in the Compulsory Immunization Program in Kuwait. A single intradermal injection (0.05 ml) is administered at the age of 3 months, and a second vaccination is sometimes given at school age to those with a negative tuberculin reaction. Although a single dose of BCG vaccine may cause LV, the incidence appears to increase with multiple injections (9). The time interval between vaccination and skin lesion development may be several months to years, with a mean duration of 1 year (10). The factors that may be responsible for the development of BCG-induced LV include inherent susceptibility, the virulence of BCG organism, the amount of inoculum, and the inoculation technique (4).

With the increasing incidence of tuberculosis and multidrug resistance, it is likely that BCG vaccination will be promoted in more countries. While we emphasize the use of less virulent vaccine and a proper vaccination technique, dermatologists, pediatricians, and other specialists should be aware of this rare presentation and treat it appropriately.

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AUTORS' ADDRESSES

Nabeel M Najem, MD, Consultant Dermatologist, Head of Department, Department of Dermatology, Adan Hospital, P.O. Box 46969, Fahaheel 64020, Kuwait, E-mail: nm_najem@hotmail.com

Valid Bagher Zadeh, MD, Registrar Dermatologist, Department of Dermatology, Adan Hospital, P.O. Box 46969, Fahaheel 64020, Kuwait, corresponding author, E-mail: walid_md2000@hotmail.com

Adel H. Al-Abdulrazzaq, MD, Senior Specialist Dermatologist, same address, E-mail: razzaq110@hotmail.com

Sultan R. Al-Otaibi, MD, Specialist Dermatologist, same address, E-mail: dralotaibi@hotmail.com

Randhir S. Kadyan, MD, Consultant Dermatologist, same address, E-mail: drkads@yahoo.com

Munish Joneja, MD, Consultant Histopathologist, Department of Histopathology at Radiology, Nuclear Medicine & Laboratory Center, YIACO Medical Co. K.S.C.C, Kuwait, E-mail: munishjoneja@yahoo.com