

Cutaneous tuberculosis with a difference: Documenting transfollicular elimination of granulomas

Chirag A. Desai, Uday Khopkar

Department of Skin and VD, Seth Gordhandas Sunderdas Medical College and King Edward Memorial Hospital, Mumbai, Maharashtra, India

ABSTRACT

A patient presented with a an asymptomatic brown to erythematous, scaly indurated solitary plaque on his elbow. The lesion was diagnosed as lupus vulgaris on the basis of clinical features and biopsy findings. The histopathology further revealed a granuloma within the follicular infundibulum, which was possibly being expelled out. The phenomenon of transepidermal elimination has been described previously in many conditions, including cutaneous tuberculosis; however, transfollicular elimination of the granuloma has not been reported. We report this unusual phenomenon as a possible mode of elimination of the granuloma.

Key words: Cutaneous tuberculosis, granuloma, lupus vulgaris, transfollicular elimination

INTRODUCTION

Cutaneous tuberculosis is infection of the skin by *Mycobacterium tuberculosis* characterised by tuberculoid granulomas.^[1,2] Transepithelial elimination of granulomas has been reported in the past;^[1] however, transfollicular elimination has not found a mention in the dermatologic literature. Herein we report this curious phenomenon and correlate it with the clinical features of this condition.

showed dense inflammatory infiltrate comprising lymphocytes, plasma cells, and epithelioid cells. Langhan's giant cells were also present, few of which were seen within a granuloma engulfed by a hyperplastic follicular infundibulum. Areas of caseous necrosis and variable fibroplasia were present. PAS stain for fungi was negative [Figures 2 and 3]. A final diagnosis of lupus vulgaris was made. Antituberculous treatment was started; however, the patient was lost to follow-up.

CASE REPORT

A 43-year-old male presented with an asymptomatic lesion on his left elbow of duration 6 years with a gradual increase in size. The patient could not recollect any history of penetrating injury or insect bite or any other trauma at the site of lesion. On clinical examination, the lesion was a well-circumscribed, erythematous to brown, scaly, indurated plaque measuring 5 × 6 cm over the left elbow. There were no similar lesions elsewhere on the body [Figure 1]. Complete hemogram and chest radiograph were normal. Mantoux test was 12 × 10 mm. Skin biopsy revealed pseudoepitheliomatous hyperplasia with hyper- and parakeratosis of the stratum corneum and a thick granular layer. The dermis

DISCUSSION

Cutaneous tuberculosis occurs due to reinoculation of skin and the subcutis by *M. tuberculosis*.^[1,2] Initial reaction of tissues to tubercle bacilli is that of nonspecific inflammation wherein the bacilli multiply and are killed by neutrophils. Macrophages then phagocytose

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Address for

correspondence:

Dr. Chirag A. Desai,
B21, Krishnalaya
Bldg, 6th Floor,
NS Mankikar Marg,
Chunabhatti-West,
Mumbai - 400 022,
Maharashtra, India.
E-mail: 83.chirag@gmail.com



Figure 1: Erythematous scaly plaque over the left elbow

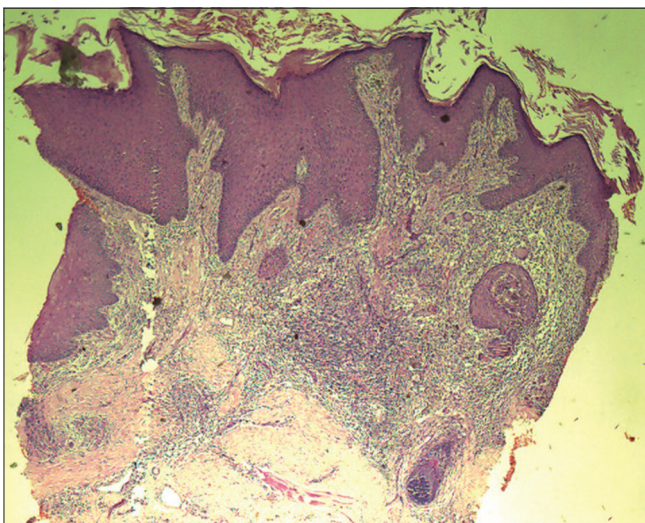


Figure 2: Histopathological examination showing pseudoepitheliomatous hyperplasia of the epidermis with granulomatous inflammation of dermis (H and E $\times 10$)

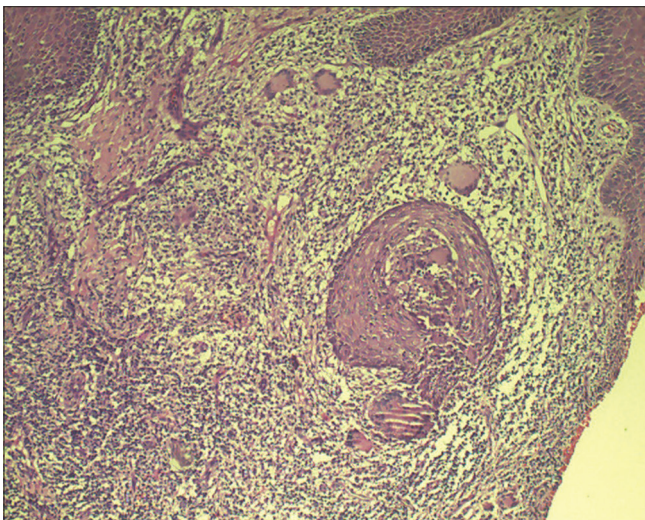


Figure 3: Granuloma within a hyperplastic dilated follicular infundibulum (H and E $\times 40$)

the organisms, but their ability to kill the organisms depends on their enhanced activation, which is mediated by cytokines that are secreted by T-cell-mediated reaction to tuberculous antigens. These activated macrophages are then converted into epithelioid cells. Some of these fuse to become giant cells. Macrophage death, mediated by tumor necrosis factor- α and macrophage proteases results in caseation necrosis within the granuloma. This necrotic process inactivates or kills mycobacteria in the lesion, but does not completely eliminate them.^[3] Similarly the tissue also tries to eliminate the bacilli surrounded by the necrotic granuloma transepidermally and probably transfollicularly, although these phenomena have been rarely reported.

The epidermis, as an organ of catharsis, serves actively in percutaneous elimination of materials from the skin by phagocytosis as demonstrated by the Langerhans cells, selective uptake and elimination of small particles such as melanin granules through intercellular spaces in the epidermis and eventually shed off with keratin, and lastly by epidermal proliferation as in the case of various perforating disorders, calcinosis cutis, granulomatous disorders etc.^[4-6]

The hypothesis explaining the reactive process of epidermal proliferation and elimination of larger particles from the dermis was put forward by Mehregan in discussing the pathogenesis of elastosis perforans serpiginosa.^[4,7] He postulated that the area where the epidermis comes in contact with foreign material undergoes marked acanthosis resulting in pseudoepitheliomatous hyperplasia. This allows the hyperplastic epidermis to engulf the noxious material and inflammatory cells associated with it. Subsequently this material gets extruded to the surface by forming canals through the hyperplastic epidermis. A reactive hyperplasia of the epidermis is seen in varying degrees in chronic dermal granulomata such as those of tuberculosis, deep fungal infections, calcinosis cutis,^[8] and so on. This process seems to be triggered by the presence of certain reactions in the dermis that are ordinarily chronic and usually associated with multinucleate giant cells. Once this dermal reaction has proceeded to a certain extent to influence the epidermis, the latter proliferates and its hyperplastic strands invade the dermis, eventually enveloping and engulfing the dermal material and infiltrate. The engulfed material varies and may consist of connective tissue constituents as in elastosis perforans serpiginosa, minerals as in calcinosis cutis, or granulomata in tuberculosis, sarcoidosis, or deep fungal infections.^[4] The phenomenon of transepidermal elimination of granulomas through a hyperplastic epidermis was first reported by Goette and Odmon.^[1]

In our case, the granuloma is entrapped in hyperplastic follicular infundibulum probably in a process of elimination, that could correlate with the follicular plugs seen on the surface of the

lesion clinically. Transfollicular elimination of granulomas in cutaneous tuberculosis has not been reported in the past; we report this rare phenomenon as one of the probable modes of granuloma expulsion.

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Conflicts of interest

There are no conflicts of interest.

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