Perforating granuloma annulare in a young male following application of the tattoo

Sir,

Perforating granuloma annulare (PGA) is a very rare subtype of granuloma annulare (GA), reported on the extremities of children and young adults.[1-3] This variant has a chronic course, and isolated cases have been reported in association with diabetes mellitus, tuberculosis, rheumatoid arthritis, HIV/AIDS and herpes zoster infection.[3-5] It is characterized by a well-demarcated, annular lesion consisting of papules of 1–5 mm (most are umbilicated), with perforation in their centres. Pustular lesions and scars may be found. Lesions are usually located on the extremities but may also appear in other regions of the body.[6]

A granulomatous reaction pattern resembling PGA within the confines of a tattoo, is a very rare finding, and only two such cases have been reported in English literature.[7,8]

A 24-year-old male developed an asymptomatic annular erythematous plaque on dorsum of his right hand 2–3 months after tattoo application. There were no systemic complaints. On closer examination, tiny papular lesions were seen all over the site of tattoo application, many of them having central plugs. There was a gradual increase in induration and thickness of the plaque,

which covered almost all of the tattoo mark [Figure 1]. The patient received three sittings of intralesional triamcinolone (10 mg/ml) and topical steroids over a period of 1 year. With this treatment, there was 20–30% decrease in thickness of the lesion. A clinical diagnosis of PGA was suspected.

Biopsy taken from the lesion revealed a granulomatous reaction in the dermis consisting of palisading histiocytes around an aggregate of necrobiotic collagen. Surrounding dermis showed perivascular chronic inflammatory cell infiltrate comprising of lymphocytes and few plasma cells. Multiple step cuts revealed a defect in the epidermis through which the degenerated collagen was seen coming out [Figure 2]. The collagen fibers were seen oriented vertically in the dermis on Masson's trichrome stain. Special histochemical stains did not reveal any organism. Based on the clinical presentation and histopathological findings, a diagnosis of PGA was made.

Cutaneous reactions to tattoo dyes cmay be classified into three categories: Inoculative/infective, coincidental lesions, including tumors, and allergic/lichenoid/granulomatous reactions.[7]

Most of the cutaneous hypersensitivity reactions to exogenous tattoo pigments can be classified as lichenoid or granulomatous.[9] An extensive literature search revealed only two prior cases of a PGA – like reaction, which were confined to the area of the tattoo.[7,8]

Although PGA forms a subtype of GA, the age distribution and the localization of lesions clearly differ. Patients with GA present with a single lesion in more than 50% of cases, while this presentation accounts for only 9% of patients with PGA.[2,10] The etiology of this type of cutaneous response is unknown, but is most likely due to a delayed-type hypersensitivity reaction, to either the pigment or its carrier solution.

Histologically, epithelial atrophy and perforation could be explained by the expansive growth of the necrobiotic granuloma that is located superficially in the dermis with the transepithelial elimination of the degenerated dermal collagen.[1] Clinical differential diagnoses, include papulonecrotic tuberculid, sarcoidosis, molluscum contagiosum or perforating collagenosis.[2] Reactive perforating dermatoses, mainly reactive perforating collagenosis are the closest differential diagnosis on histopathology. The lesions can be treated with topical or intralesional corticosteroids, cryotherapy, tacrolimus or imiquimod cream.[11,12] However, it has been reported that the treatment for this entity is disappointing and that no treatment at all is as useful as any treatment.[2]

The diagnosis in this case was suspected on clinical grounds based on the history of tattoo application and the presence of a typical annular lesion with multiple plugs. Histologic examination confirmed the diagnosis and emphasized the importance of clinico-pathologic correlation. It is also emphasized that multiple sections of a biopsy may need to be taken in order to reveal the characteristic, but focal epidermal communication.

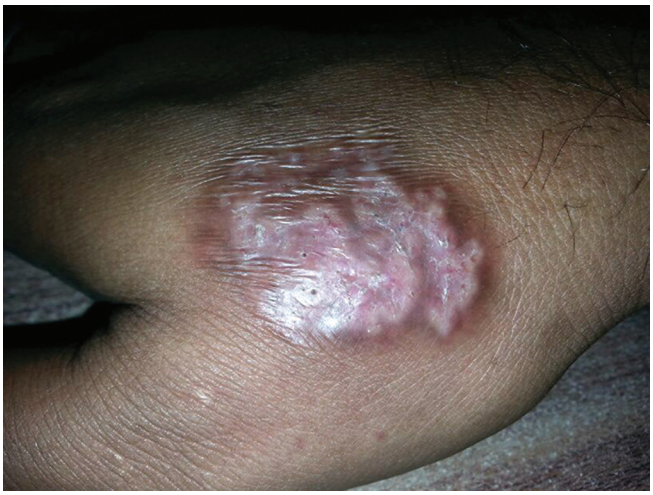

Figure 1: Erythematous plaque confined to the area of tattoo on dorsum of right hand, containing numerous papules, some with central plugs

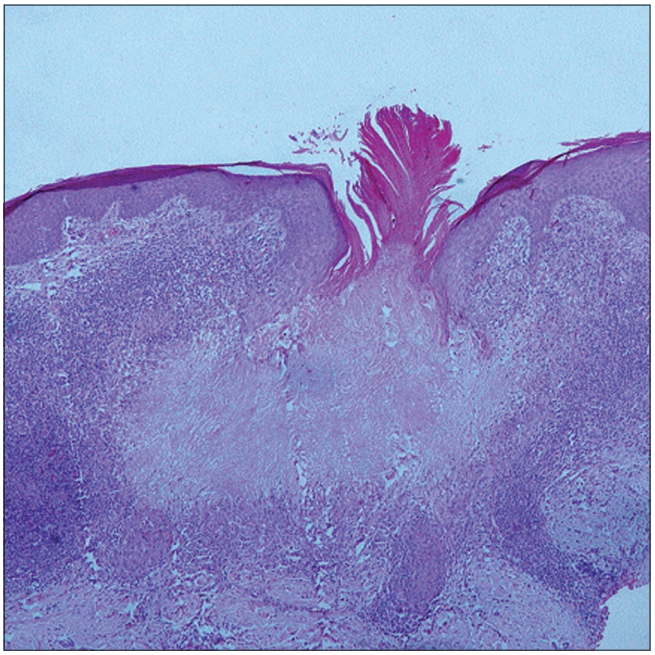

Figure 2: Microphotograph showing a defect in the epidermis through which degenerated collagen is protruding out. Dermis shows palisaded granulomas surrounding the necrobiotic collagen aggregate (H and E, ×400)

Neha Kawatra Madan, Archana George Vallonthaiel, Sudheer Arava, Md. Firdaus Ali, Mankul Goyal[1], Manoj Kumar Singh

Departments of Pathology and [1]Dermatology, All India Institute of Medical Sciences, New Delhi, India

Address for correspondence:
Dr. Sudheer Arava,
Department of Pathology, All India Institute of Medical Sciences,
New Delhi - 110 029, India.
E-mail: aravaaiims@gmail.com

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DOI:
10.4103/2229-5178.160286