

Sarcoidal granulomatous reaction to microneedling with vitamin C serum



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INTRODUCTION

Microneedling is a cosmetic dermatological therapy that creates controlled skin injury in order to induce remodeling through extensive stimulation of collagen and elastin production. These microtraumas are often performed in conjunction with the application of topical products, including vitamin serums, glycolic acid, and antiaging cosmeceutical products. Alternatively, microneedling can be performed with a patient's own platelet rich plasma. Review of the literature reveals few severe adverse reactions to microneedling with topical preparations.¹ This report describes a rare sarcoidal granulomatous reaction to microneedling. Sarcoidal granulomatous reactions can result following injection or injury of an immunogenic foreign body antigen into the dermis. On histology, this is characterized by granulomas comprised of epithelioid histiocytes and lymphocytes. We report a unique case of a sarcoidal granulomatous reaction following microneedling with vitamin C serum in a patient with no significant medical history. Although vitamin serums are commonly used topically, this report highlights their potential role in inciting dermal granulomatous reactions.

CASE REPORT

A 54-year-old female with no past medical history presented to the clinic for bumps on the neck for

1 month. She reported that this eruption began as small bumps on all sides of her neck that had only slightly grown in size. She reported associated itch and irritation to the area. She denied prior history of this rash. She reported having a microneedling procedure done 1 month prior by an esthetician, during which a small microneedling pen was used on the neck with vitamin C serum as a lubricant. She reported having such microneedling treatments done before without any reactions; however, at those times platelet rich plasma was used. At the last treatment, she was told that her blood was not separating properly, and therefore platelet rich plasma could not be used with the microneedling pen. She had not yet tried any treatment for the bumps.

On physical exam, numerous small skin-colored to pink smooth-topped 0.2 cm monomorphous papules were noted on the anterior neck. The papules were in a linear configuration with well-demarcated borders, representing the area previously treated with microneedling (Fig 1). A 2 mm punch biopsy was performed, revealing discrete collections of epithelioid histiocytes adjacent to follicular units in the dermis with some lymphocytes (Figs 2 to 4). After level sections were obtained and reviewed, and a periodic acid–Schiff stain was negative for fungal elements, the diagnosis of sarcoidal granulomatous perifolliculitis was given.

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Fig 1. Anterolateral neck of patient demonstrating numerous pink papules in a well-demarcated, linear configuration.

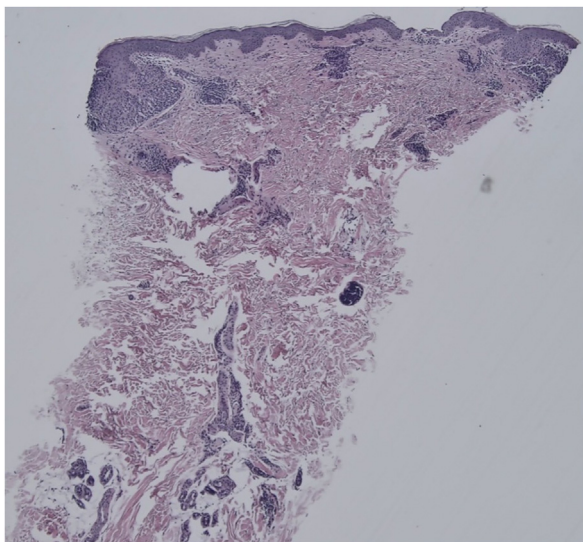


Fig 2. Hematoxylina and eosin, original magnification $\times 40$ of 2 mm punch biopsy demonstrating focal sarcoidal granulomas surrounding the follicular units.

The patient was given triamcinolone 0.1% ointment as initial treatment.

At the follow up appointment, the patient denied improvement with triamcinolone ointment. She was offered intralesional triamcinolone injections at 5 mg/ml to 3 papules, to which she agreed. The patient was also referred to rheumatology, who did not find any evidence of systemic sarcoidosis after

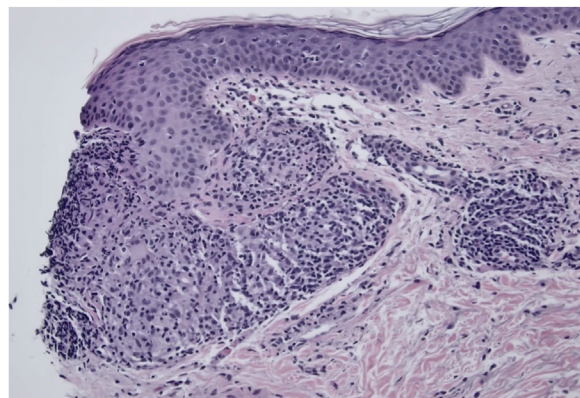


Fig 3. Hematoxylina and eosin, original magnification $\times 200$ showing histiocytes and lymphocytes comprising the granuloma.

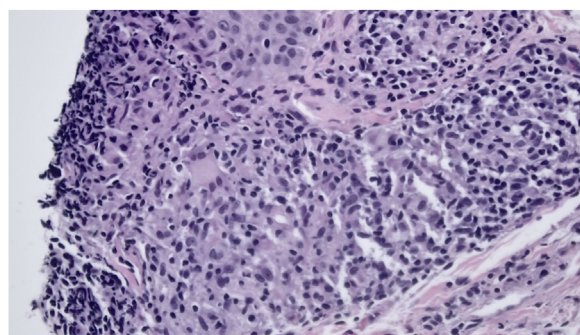


Fig 4. Hematoxylina and eosin, original magnification $\times 400$ demonstrating the epithelioid quality of histiocytes admixed with lymphocytes.

work up. The patient was subsequently lost to follow-up.

DISCUSSION

Microneedling reactions rarely include granuloma formation, though some cases have been described.²⁻⁴ Sarcoidal granulomatous reactions are often incited by foreign bodies such as desensitizing injections, silicone, and tattoos. These exogenous irritants are postulated to act as antigenic stimuli that induce a proinflammatory state leading to granuloma formation. The standard of care for sarcoidal reactions emphasizes the suppression of activated macrophages and T cells along with their production of cytokines, including interleukins 1 and 6 and tumour necrosis factor alpha. Steroids are the first line treatment for sarcoidosis, with intralesional injections of triamcinolone (3-10 mg/L) or topical steroids often utilized for cutaneous disease management.⁵

Microneedling is a safe treatment option for an array of dermatological conditions and skin

rejuvenation, offering effective clinical results in a minimally invasive manner. Common adverse reactions include swelling, pain, erythema, and rarely “tram track” scarring, which describes a linear arrangement of papules along the area of microneedling treatment.³ The use of vitamin C, an antioxidant helpful in reducing photoaging, has shown efficacy in minimizing hyperpigmentation.⁶ However, its potential in eliciting unwanted side effects in the setting of microneedling has yet to be thoroughly investigated. While topical use of vitamin C and other cosmeceutical serums is generally regarded as safe, intradermal penetration may stimulate granulomatous processes.

Our case describes a patient’s sarcoidal granulomatous eruption as a rare adverse effect of a microneedling treatment with vitamin C serum. Because the patient lacked a history of drug or cosmetic allergies and showed no evidence of systemic sarcoidosis, it can be postulated that vitamin C or another ingredient in the serum may have played a role in the subsequent granulomatous reaction. Additionally, the papules presented in the lines of microdermabrasion and were recalcitrant to topical triamcinolone ointment.

Other reactions, although not sarcoidal in nature, were reported in 2 patients who underwent microneedling therapy with vitamin C serum. One patient, with a prior history of diffuse facial eruptions, developed a progressive, erythematous rash on her face following treatment and was eventually hospitalized with arthralgias and elevated erythrocyte sedimentation rates.² In the second case, a patient with a dermatological history of botulinum toxin A and hyaluronic acid fillers experienced facial redness, swelling, and blistering along her chest and face following vitamin C microneedling.² This study also reported 2 patients with delayed hypersensitivity-type granuloma formation and supports vitamin C as the culprit. Patch testing of the serum ingredients revealed +1 reactions to vitamin C in both patients, while the remaining ingredients (retinyl palmitate, cholecalciferol, C tinctorius, and lecithin) showed no reaction.²

The vitamin C serum utilized in our case is composed of the following ingredients: water, 15% ascorbic acid, triethanolamine, glycolic acid, propylene glycol, glycerin, citric acid, lactic acid, phenoxethanol, zinc sulfate, disodium edta, and sodium hyaluronate (all hydroxy acids add up to 10%). It is possible that an ingredient other than vitamin C, such as lactic acid or hyaluronic acid, triggered the sarcoidal granulomatous reaction.^{7,8} As the patient was lost to follow up, no further studies isolating which ingredient caused the reaction were performed. Therefore, we are unable to definitively identify a culprit. To ascertain the inciting ingredient, further studies could include patch testing and intradermal injections, alone and in combination with microneedling.

Conflicts of interest

None disclosed.

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