Letter to the Editor

A Cutaneous Reaction to Microneedling for Postacne Scarring Caused by Nickel Hypersensitivity

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Microneedling is a simple, minimally invasive, effective, and relatively cheap means to treat postacne scarring. It is widely practiced due to ease of performance and the low risk of complications. Side effects of microneedling that have been reported in the literature include erythema, swelling, pain, hyperpigmentation, and, rarely, tram track scarring.[1,2] We have encountered an unusual cutaneous reaction to microneedling in one of our patients who underwent this procedure for postacne scarring.

A 24-year-old woman with Fitzpatrick skin photo-type IV presented to us in October 2013 for the treatment of postacne atrophic facial scars, the majority of which were superficial rolling scars. We planned to undertake a microneedling procedure for her. As a protocol, we do a test patch over a small area of one side of the face (4 × 4 cm) and if there are no complications, the rest of the face is treated after 2 weeks. Local anesthetic cream (lidocaine 2.5% and prilocaine 2.5%) was applied over the lateral part of her right cheek and after 1 hour it was completely cleaned with normal saline. After aseptic preparation of the skin with betadine, we performed microneedling over the right lateral cheek with a dermaroller (Derma India, Tamil Nadu, India) containing titanium-coated, stainless steel 1.5 mm needles (Figure 1). However, in this patient, a larger area was treated inadvertently while doing the test patch. No serum or chemical was applied before, during, or after the procedure over the treated area. The patient returned to us after 6 days with complaints of erythematous papular lesions appearing at the site of treated area. She gave us history that the erythema and oedema at the treated site gradually became intense over 24 hours and then remained the same for next 1 to 2 days. Gradually, the oedema partially subsided and she noticed the presence of multiple tiny erythematous papules and a few vesiculopustular lesions (Figure 2A). Erythematous papules were arranged linearly along the lines of microneedling giving a "rail track appearance." Our patient did not apply anything over the treated area post-procedure except for sunscreen, which she was also using before the procedure. There was no history of any drug or cosmetic allergy, but the patient did note an intolerance to artificial jewelry. She did not develop any systemic symptoms. Tzanck smear and Gram stain from the affected area were negative. The patient refused a skin biopsy from the lesions over the face. We started her on oral prednisolone (30 mg) daily for 5 days, following which mild topical corticosteroids were continued. There was complete clearance at the end of 4 weeks (Figure 2B). After 3 months, we performed patch testing with nickel sulfate (5% in petrolatum) and titanium (10% in petrolatum) on her upper back, and readings were taken after 48 and 96 hours. The patch test was negative for titanium. At 48 hours, on the nickel patch test site she developed infiltration, tiny vesiculopustular lesions on surface,

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and intense erythema, which extended beyond the margins of chamber (Figure 3). At 96 hours the reaction had partially subsided. The patient refused a skin biopsy from the test patch site.

Figure 1. Dermaroller (Derma India, Tamil Nadu, India) containing titanium coated tips of stainless steel needles.

Soltani-Arabshahi et al[3] reported 3 patients with allergic granulomatous reaction and systemic hypersensitivity following microneedling therapy for skin rejuvenation. Two of their patients had applied high dose of Vita C Serum (Sanítas Skincare, Louisville, CO) over the face and the third patient had applied Boske Hydra-Boost Gel and Vital Pigment Stabilizer (Dermapen, LLC, Salt Lake City, UT) while undergoing a microneedling procedure, and the foreign body granulomatous reactions were ascribed to the cosmeceuticals. In our patient, no cosmeceuticals were used during the procedure and the reaction is ascribed to the microneedling procedure, per se. Our patient developed the reaction early, there were no systemic features, and she responded to a short course of topical and systemic steroids. The pattern of reaction suggested that the reaction was centered on each needle prick site. Only the needle tips in the dermaroller were coated with titanium, while the whole needle itself made up of stainless steel. Irrespective of potential wearing off of titanium, the patient was exposed to nickel since a significant part of the needle enters the skin, not just the tip. Therefore, the titanium coating of tip cannot alone prevent the reaction occurring with nickel. We did patch testing with both titanium and nickel sulfate. The patient developed strong patch test reactivity at the nickel patch test site and its morphology closely resembled the reaction site over her face. As the patient refused a skin biopsy, we could not ascertain whether the reaction was solely allergic in nature or a mix of irritant and allergy. We suspect that our patient had possibly developed contact dermatitis to the nickel metal which leached out from the needles of the dermaroller. The possibility of

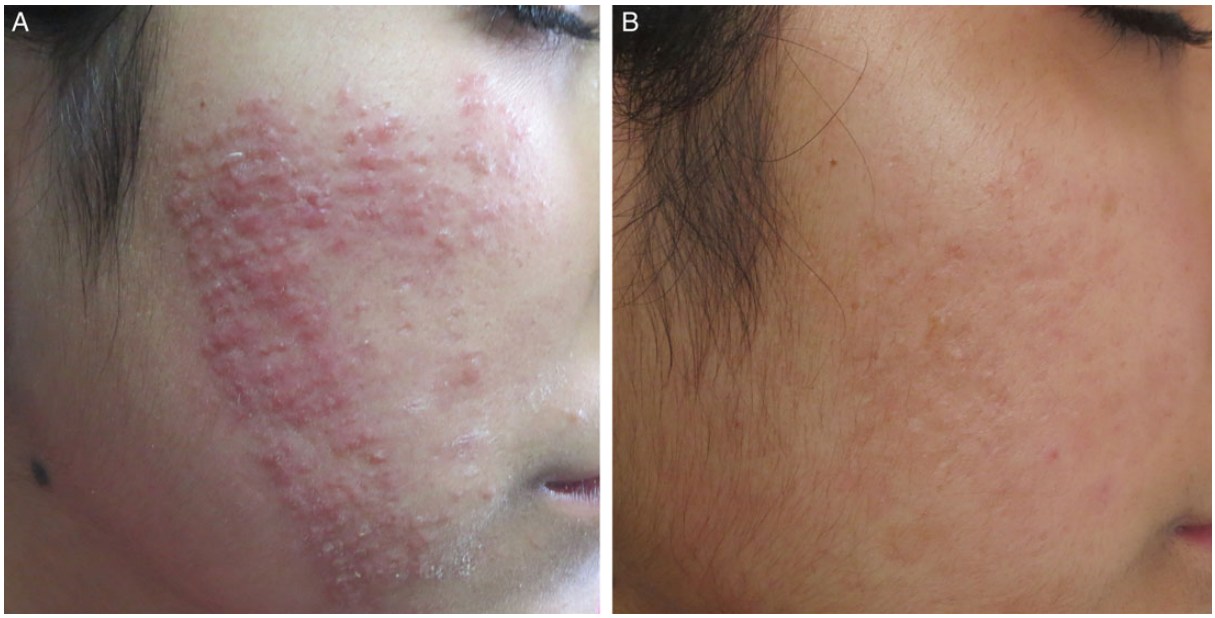

Figure 2. (A) Erythematous papules on the right cheek arranged in rail track pattern on this 24-year-old woman. (B) Complete clearance of the rash at 4 weeks.

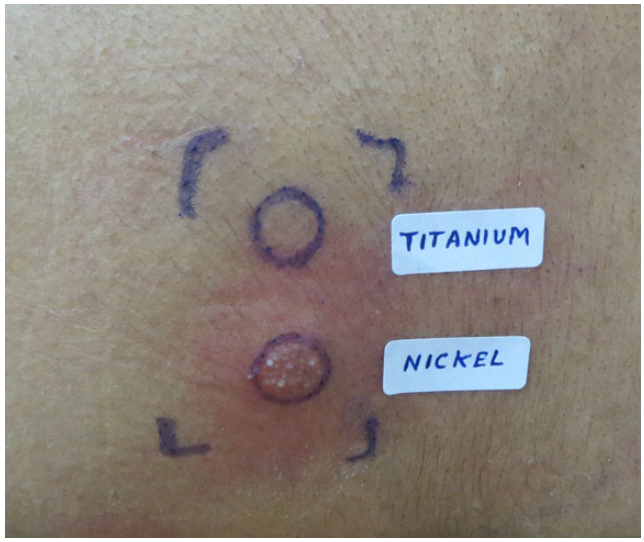

Figure 3. Strongly positive patch test reaction to nickel sulfate and negative patch test reaction to titanium at 48 hours on the patient's upper back (same patient as in Figure 2).

irritant reaction to betadine is less likely, as only a small amount was used, it was thoroughly cleaned before the procedure, and it was not applied under occlusion. Allergic reaction to betadine is, however, rare. Another possibility which cannot be completely ruled out is a reaction to a small amount of topical anesthetic cream, which may have gotten inoculated into skin by microneedling. However, the patient did not develop itching or erythema while the topical anesthetic cream was applied over the cheek for an hour and it was also properly cleaned before the procedure.

In our patient, we are not able to ascertain the cause of such a patterned rash with conviction, but this case teaches us that we should take a patient's history of any allergic reactions to the metals included in the dermaroller's needles. If a patient gives history of sensitivity, then consider doing a patch test with the suspected metals. If conducting a patch test to detect allergic contact dermatitis is not possible, then one should certainly consider doing a microneedling patch test over a small area over the patient's forearm before performing microneedling over the face. Also, thoroughly clean the local anesthetic cream and antiseptic lotions before microneedling.

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