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Case Report
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A Keratoacanthoma Occurring Post Non-ablative Resurfacing

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Abstract

This case regarding a Caucasian female patient who suffered from discoloration and rhytides on her face, neck and chest with a past history of non-melanoma skin cancer followed by Mohs micrographic surgery. The patient was treated with methotrexate injections to cure her problem.

Keywords: Keratocanthomas; Rhytides; Fitzpatrick skin; Non-ablative fractional photothermolysis

Introduction

Multiple eruptive keratocanthomas have been reported on the dorsal hands and face following treatment with fractional and non-fractional ablative carbon dioxide (CO_2) lasers respectively [1,2]. More recently, eruptive keratoacanthomas (KA's) have been reported on the legs in two patients following treatment of photoaging with non-ablative fractional photothermolysis with a 1,550 nm erbium-doped laser (Fraxel SR, Reliant Technologies Inc., San Diego, CA) [3].

Case Report

A 54-year-old Caucasian woman with Fitzpatrick skin type III presented with discoloration and rhytides on her face, neck and chest. She had a history of non melanoma skin cancer that had been treated with Mohs micrographic surgery in the past. Her medical history was remarkable only for intermittent orolabial herpes simplex outbreaks.

On examination, the patient had reticulated light brown macules and patches and static rhytides on her face, neck and chest. The patient chose to undergo treatment with non-ablative fractional photothermolysis with a 1,550 nm erbium-doped laser for face, neck and chest. Prior to treatment the patient was given oral valacyclovir for herpes simplex prophylaxis and the areas to be treated were anesthetized with topical lidocaine followed by supraorbital, infraorbital and mental nerve blocks with 1% plain lidocaine. Treatment settings were as follows: fluence 60 mJ/cm^2, treatment level 10 with 8 passes. A cold-air cooling device was used for patient comfort and the patient tolerated the procedure well.

Five days after the procedure the patient developed an enlarging, tender, solitary erythematous papulonodule on her left nasal supratip (Figure 1). She denied drainage and denied fever or chills. The patient was empirically started on oral doxycycline for a presumed furuncle and a shave biopsy of the nodule revealed the surface of a keratoacanthoma. The patient was treated with four injections of intralesional methotrexate 25 mg/mL, four weeks apart with resolution of the lesion clinically and histologically (Figure 2).

Discussion

Keratoacanthomas (KA's) are considered low-grade malignant skin tumors that may arise over sites of trauma. To our knowledge this is the first case of a solitary KA occurring on the face following non-ablative fractional photothermolysis with a 1,550 nm erbium-doped laser. In addition, the onset of our patient's KA five days post procedure is more rapid than those previously reported in the literature occurring 4-6 weeks following treatment of the legs with fractional 1,550 nm erbium-doped laser [3].

Fractional photothermolysis (FP) is considered to be very safe with a large retrospective study of 961 patients treated with FP having an overall complication rate of 7.6%; these included acneiform eruptions (1.9%) and herpes simplex virus outbreaks (1.8%) most frequently observed and no tumor development reported [4]. It has been proposed that the pathogenesis of KAs occurring in the

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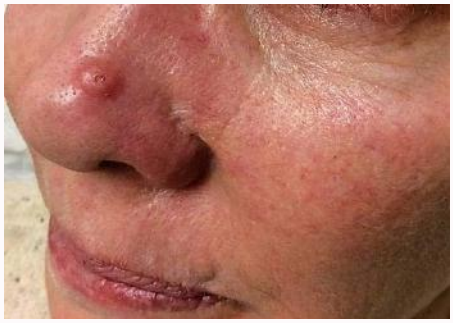

Figure 1: An enlarging, tender, solitary erythematous papulonodule on left nasal supratip.

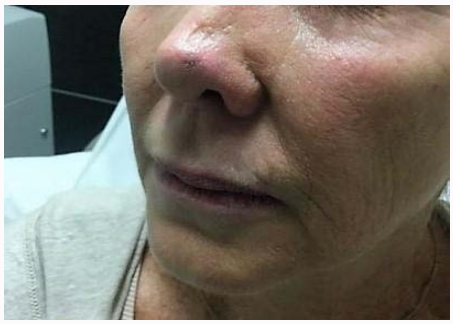

Figure 2: After four injections of intralesional methotrexate.

setting of non-ablative FP may be related to trauma to the follicular unit since acneiform eruptions are also frequently seen in this setting [3]. In the case of KAs occurring after fractional ablative CO_2 laser resurfacing, it has been suggested that a pathergy from trauma triggers an upregulation of the inflammatory response and a downregulation of the immune response which leads to undue susceptibility to a second stimulus [1]. The authors believe that the etiology of a KA following non-ablative fractional resurfacing is likely multifactorial and in this case involved a predisposed host with a history of photo damage and non-melanoma skin cancer plus the microthermal injury induced by the laser as a trigger. A solitary facial KA developing following fractional non-ablative 1,550 nm laser resurfacing is undoubtedly a rare phenomenon given the large number of such procedures performed in this patient population and the paucity of cases reported in the literature. We also find it noteworthy that in all other reports of post-laser KA development, multiple KA's erupted, whereas in this case the lesion was solitary. This could suggest the 'unmasking' of a subclinical low-grade premalignant lesion that was present pre-procedure on the patient's nasal supratip.

Our patient was treated with four rounds of intralesional methotrexate with resolution of the lesion. In a retrospective study of 38 KA's treated with either 12.5 mg/mL or 25 mg/mL of intralesional methotrexate and a mean of 2.1 injections, 92% of patients achieved resolution with this modality alone [5]. We believe this variant of KA occurring post laser resurfacing represents a clinically and prognostically different entity from the well-differentiated squamous cell carcinoma-KA type which should be treated with surgical extirpation and margin assessment. However, to be cautious we performed a frozen section histologic evaluation of the site following treatment with methotrexate to ensure no residual atypia was present.

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