



## Case Report

## Facial lipogranulomas due to self-injection of vitamin A oil

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## ABSTRACT

Lipogranulomas represent foreign body reactions to exogenous lipid or oil-like substances introduced into the skin. These lesions characteristically have round-to-ovoid, vacuole-like cavities of varying sizes in the dermis, which results in a Swiss cheese-like appearance. We present the case of a 51-year-old Hispanic woman with an onset of painful, swollen, subcutaneous nodules on the face, most prominently on the right lower lip and both cheeks, after multiple self-injections of vitamin A oil. Histopathology test results of the lower lip showed a superficial-to-deep, nodular and interstitial, polymorphous inflammatory infiltrate of predominantly histiocytes with necrobiotic-type granulomatous changes, lymphocytes, and plasma cells. The cheek revealed deep dermal and subcutaneous small collections of foamy/vacuolated histiocytes, without significant numbers of other inflammatory cells. Given the patient's history of injecting oil extracted from vitamin A capsules into her skin, the light microscopic features are consistent with lipogranulomatous changes that are secondary to a local injection of foreign material. Clinicians and pathologists should be aware of the granulomatous immune reaction generated by the injection of unregulated products into the face and other areas of the body.

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## Introduction

Lipogranulomas can represent foreign body reactions to exogenous lipid or oil-like substances introduced into the skin. They can also result from the endogenous degradation of lipids during allergic processes or trauma (Park and Kim, 2016). These lesions characteristically have round-to-ovoid, vacuole-like cavities of varying sizes in the dermis, which result in a Swiss cheese-like appearance. Clinicians and pathologists should be aware of the granulomatous immune reaction generated by the injection of unregulated products into the face and other areas of the body.

## Case report

We present the case of a 51-year-old Hispanic woman with an acute 2-week onset of painful, swollen subcutaneous nodules on the face, most prominently on the right lower lip and both cheeks (Fig. 1). At the time of presentation, she denied any recent trauma, medical/cosmetic procedures, changes to medications, or foreign travel. Her medical history was unremarkable. Overall, the patient

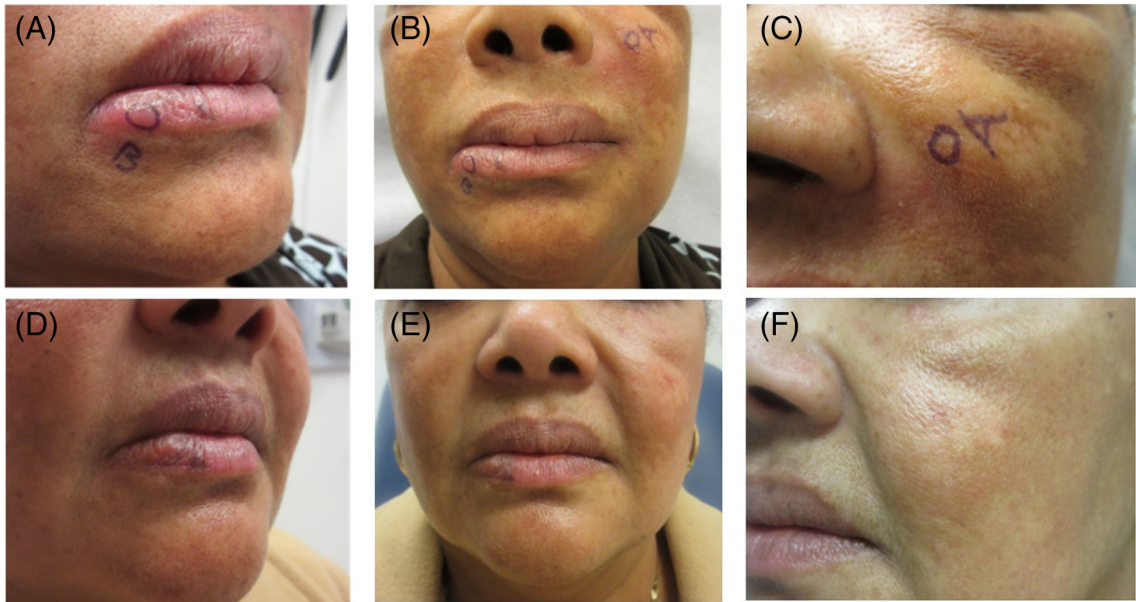
felt well and had not experienced any fevers, chills, joint pains, other constitutional symptoms, or recent illnesses. No other household contacts were affected.

On physical examination, her lower lip was markedly swollen, and painful subcutaneous nodules were palpable over both cheeks with overlying erythema (Figs. 1A–C). There was no cervical lymphadenopathy. The clinical differential diagnosis included lupus profundus, lymphoma, granuloma faciale, or sarcoidosis. Two punch biopsies were performed, and superficial-to-deep dermal and subcutaneous collections of foamy/vacuolated, cluster of differentiation (CD) 68+/CD163+ histiocytes (lipogranulomas) with variable numbers of other inflammatory cells were identified on hematoxylin and eosin and immunohistochemical stained sections (Fig. 2). Periodic acid-Schiff, Gomori methenamine silver, Gram, Warthin-Starry, acid fast bacilli, acid fast bacilli-fite special stains, and spirochete immunostain were negative for microorganisms. Polarization was negative for polarizable, refractile, foreign material. Tissue cultures were not undertaken.

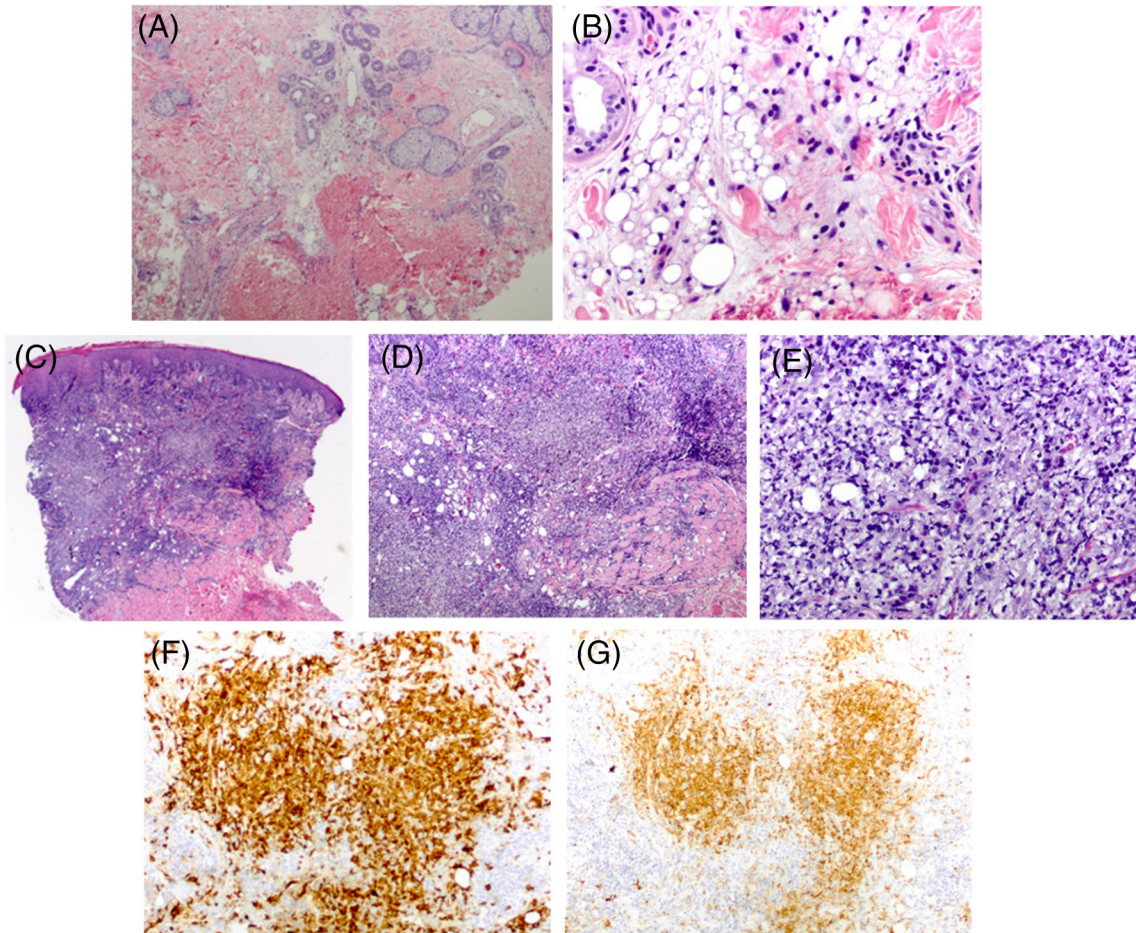
Post-biopsy, the patient admitted to self-injecting the oil from vitamin A capsules into her lips and face 4 months prior. She was started on antibiotic medications (minocycline 100 mg twice daily). After 10 months of therapy, significant improvement and resolution of the erythema, edema, and subcutaneous nodules was achieved (Figs. 1D–F).

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**Fig. 1.** Before: (A) Subcutaneous nodule on the right lower lip; (B) full face showing erythema, edema, and subcutaneous nodules; and (C) subcutaneous nodule and edema of the left cheek. After: (D-F) Minimal edema and erythema of the face with no palpable subcutaneous nodules.



**Fig 2.** (A-B) Hematoxylin and eosin histopathology of cheek biopsy: Deep dermal and subcutaneous, small collections of foamy/vacuolated histiocytes without significant numbers of other inflammatory cells ( $\times 40$ ,  $\times 200$ ); (C-E) hematoxylin and eosin histopathology of the lower lip biopsy: Superficial-to-deep, nodular and interstitial, polymorphous inflammatory infiltrate of predominantly histiocytes with necrobiotic-type granulomatous changes, lymphocytes, and plasma cells ( $\times 20$ ,  $\times 40$ ,  $\times 200$ ); and (F-G) immunohistochemistry demonstrates nodules of (F) cluster of differentiation 163+ ( $\times 100$ ) and (G) cluster of differentiation 68+ histiocytes ( $\times 100$ ).

## Discussion

The injection of foreign substances into the skin for cosmetic effect has been performed for centuries. Oils that contain impure substances are generally not indicated for intradermal/subcutaneous injection. Reports as early as 1906 identified disfiguring subcutaneous nodules in two patients after the injection of paraffin to treat facial wrinkles (Heidingsfeld, 1906).

Additionally, oil granulomas have been described in the literature after lip and face augmentation with a paraffin-containing oil (Friedrich and Zustin, 2014; Uchida et al., 2007). Granulomatous reactions have also been reported after facial injections of silicone (Ficarra et al., 2002), microneedle therapy for skin rejuvenation (Soltani-Arabshahi et al., 2014), and injection of a foreign material such as Vaseline into the penis and scrotum (Hohaus et al., 2003).

Recently, Kamouna et al. (2014) presented a case series of six women who developed firm dermal nodules, erythema, and pain after injection of vitamins A and/or E into their lips. Similar to our findings, a histopathologic analysis revealed numerous round-to-ovoid, vacuole-like cavities of varying sizes in the dermis that resulted in a Swiss cheese-like appearance consistent with a lipogranuloma (Kamouna et al., 2014). These cavities previously contained oily material that is lost during routine tissue processing.

Whether substance purity, patient susceptibility, amount injected, or specific injection site is the most important contributing cause of the inflammatory response is unknown; however, a combination of these factors is suspected (Robenzadeh et al., 1998). The cosmetic and adverse effects of these injections are likely due to the oil suspension rather than the presence of active ingredients alone. Reactions to subcutaneous injections can take weeks to years to develop, which emphasizes the importance of obtaining a detailed patient history. Lipogranulomas are characterized by three phases with varying time intervals: Initial inflammatory phase, latency phase (substance is tolerated), and final chronic/late phase (leads to granulomatous inflammation; Kamouna et al., 2014).

Treatment of these lesions is challenging but necessary to prevent clinical progression and disfigurement (Kamouna et al., 2014). A prolonged course of broad spectrum antibiotic treatments, which was successful in our case, oral and intralesional steroidal agents, allopurinol, imiquimod, isotretinoin, surgical excision, and other anecdotal treatments have been indicated for the management of foreign-body granulomatous reactions (Ficarra et al., 2002; Friedrich and Zustin, 2014; Lemperle and Gauthier-Hazan, 2009; Robenzadeh et al., 1998).

Although treatment is largely based on anecdotal case reports and series, intralesional corticosteroid agents are often the therapy of choice (Lemperle and Duffy, 2006; Lemperle and Gauthier-Hazan, 2009). An initial dose of 20 mg to 40 mg of intralesional triamcinolone has been reported, and despite a skin atrophy rate of 20%

30%, high doses are necessary to prevent recurrence (Lemperle and Duffy, 2006; Lemperle and Gauthier-Hazan, 2009). Some granulomas will resolve after one injection; others may need a course of three to six injections over 3 to 6 months; and some will spontaneously resolve on their own within 1 to 5 years (Lemperle and Duffy, 2006; Lemperle and Gauthier-Hazan, 2009).

Another report of facial injection of vitamin E oil was successfully treated with an initial week-long course of cephalexin, followed by 5 mg of intralesional triamcinolone monthly for 4 months with resolution, and no reported recurrence (Robenzadeh et al., 1998). Improvement can also be seen as early as 2 weeks after initiation of treatment with combination therapies, such as broad-spectrum antibiotic medications and systemic corticosteroid treatments (0.5–0.7 mg/kg), with no reported recurrences at the 6-month follow-up visit (Kamouna et al., 2014, 2015). Long-term follow-up for 1 to 2 years is recommended due to the potential for complications that can arise if the lesions recur.

## Conclusions

With antibiotic therapy over 10 months per patient preference, our patient achieved resolution of these nodules with no recurrences and was pleased with the results. An early diagnosis is paramount to manage these adverse reactions to achieve favorable aesthetic outcomes.

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