Fox-Fordyce disease treated with fractional CO2 laser: A case report

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Key words: apocrine miliaria; CO2 laser; FFD; Fox-Fordyce disease; fractional CO2; laser.

BACKGROUND

Fox-Fordyce disease (FFD) is a rare inflammatory condition affecting apocrine sweat glands.[1] Patients with FFD typically present with folliculocentric papules that are often pruritic and lack an associated hair shaft. Lesions are smooth, uniform, firm, and range from yellow to reddish-brown in color.[2] An evidence-based approach to management has yet to be established.

Abbreviation used:

CO2: carbon dioxide
FFD: Fox-Fordyce disease

CASE REPORT

A 23-year-old female with no significant medical history presented to clinic with well-defined skin-colored papules in the axillae bilaterally (Fig 1). The lesions were misdiagnosed as warts by the patient's family physician and had previously been treated with liquid nitrogen with no improvement. The patient complained of subsequent hyperpigmentation after cryotherapy, which had partially faded over time with topical lightening agents.

To clarify the diagnosis, 4 mm punch biopsies were taken from the axillae bilaterally. Histopathology was consistent with FFD, showing superficial perivascular and perifollicular lymphoid infiltrate extending focally around the opening of apocrine ducts near follicular infundibula (Fig 2). The epidermis was unremarkable and periodic acid-Schiff stain was negative on both biopsies.

After reviewing treatment options with the patient, we elected to proceed with fractional carbon dioxide (CO_2) laser (Lutronic ECO2) to manage her condition. The patient underwent 3 fractional CO_2 laser treatments over a 5-month period with significant improvement (Fig 3). There were no complications throughout the course of therapy and the patient's results have been maintained for 1 year postinitiation of therapy.

DISCUSSION

FFD occurs more frequently in females with a peak in incidence in young adulthood. Previously referred to as apocrine miliaria, FFD most commonly affects the axillae with rarer occurrences in the anogenital areas, periareolar areas, lips, upper thighs, and chest.[1,2] A 2021 systematic review performed by Salloum et al found that 71% of patients experienced pruritus and that 90% of FFD lesions were bilateral.[1]

The pathophysiology of FFD is not yet fully understood. Given that the typical case of FFD is a postpubertal and premenopausal female, hormonal changes are thought to play a role.[1] Symptoms in previous FFD cases have improved with the onset of menopause or oral contraceptives.[3,4] Keratotic obstruction leads to destruction of the duct and secretory portions of apocrine sweat glands, causing a downstream inflammatory response, in which lymphocytes and histiocytes are recruited to the site of epithelial injury.[2,5]

The differential diagnoses of FFD include acne vulgaris, milia, folliculitis, Darier disease, and lichen

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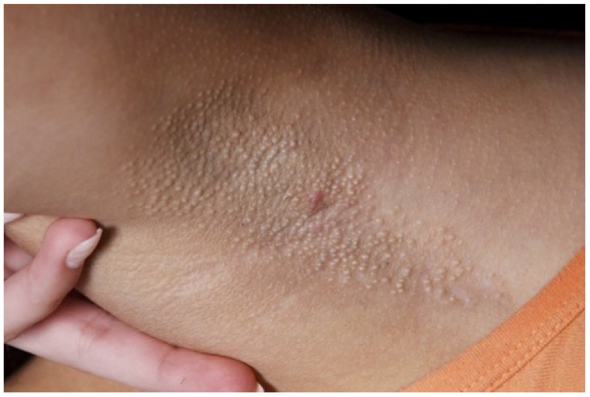

Fig 1. Fox-Fordyce disease lesions and postcryotherapy hyperpigmentation at initial presentation.

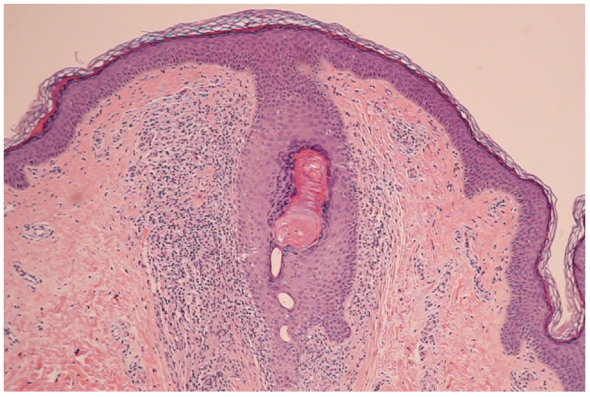

Fig 2. Histopathology of punch biopsy (hematoxylin and eosin stain, 100× magnification).

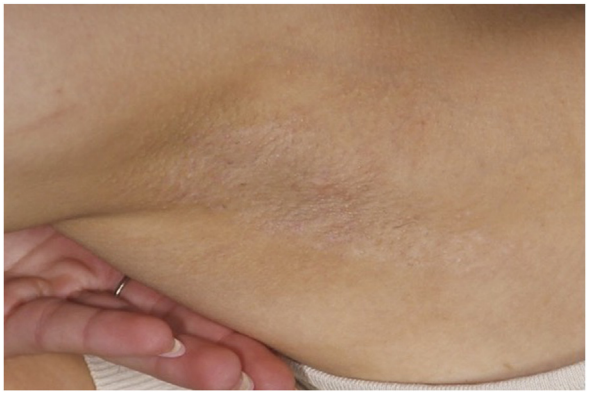

Fig 3. Fox-Fordyce disease lesions after 3 fractional CO_2 laser treatments.

amyloidosis.[1,6] Perifollicular foam cell infiltrate, infundibular dilation, hyperkeratosis, plugging, and acanthosis have been shown to be distinctive histopathological attributes of FFD.[6]

The low incidence rate and poorly understood pathophysiology of FFD have prevented an evidence-based treatment protocol from being established. Data regarding FFD management have largely come from case reports and small case series.[7] The systematic review published by Salloum et al also summarized treatment regimens for previously reported cases of FFD.

Topical retinoids were the most commonly reported treatment, used in 18% of reported cases. Less than 10% of cases treated with topical retinoids alone reached complete resolution, and 64% of patients experienced mild to moderate improvement of their symptoms. Topical clindamycin was shown to have varying results, as half of cases reached significant resolution while the other half showed little to no improvement. Topical calcineurin inhibitors, particularly pimecrolimus, showed strong efficacy, albeit with a limited sample size. Five of 6 patients experienced marked improvement of their symptoms. Most FFD cases treated with topical steroids showed little to no resolution.[1]

Oral treatments, such as isotretinoin and contraceptives, and procedural treatment, such as surgical excision and liposuction, were attempted in isolated cases.[1] Two cases of FFD successfully treated with botulinum toxin have also been recently published, presenting another promising therapeutic possibility.[8,9]

Fractional lasers have not been extensively used in the treatment of FFD lesions. There has been 1 published case of FFD treated with fractional CO_2 laser. The lesions and pruritus improved dramatically over the course of 3 sessions.[10] The degree of success seen in our patient, as well as in this previous case, suggest that fractional CO_2 laser may be an effective option in the management of FFD. Future efficacy and durability studies with larger sample sizes and longitudinal follow-up should be performed to further investigate this promising treatment modality for this condition.

Conflicts of interest

None disclosed.

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