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CASE REPORT OPEN ACCESS

Efficacy of Calcipotriol/Betamethasone Ointment in Facial Discoid Dermatosis

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ABSTRACT

Facial Discoid Dermatosis (FDD) is a rare chronic skin condition characterised by persistent, annular erythematous and desquamative papules on the face. Its aetiology is unclear, making differential diagnosis challenging. Key clinical features include pink-orange, minimally scaling lesions limited to the face, sudden onset with long-term stability, and resistance to treatment. We report a new case of FDD in a patient in his late 30's, unresponsive to various treatments until improvement with topical calcipotriol/betamethasone ointment. A review of 22 cases reveals a female predominance and broad age range. Histopathology consistently shows hyperkeratosis, parakeratosis, acanthosis, psoriasiform hyperplasia, follicular plugging, and perivascular lymphocytic infiltrate. Many cases, including ours, also reported the presence of abundant Demodex folliculorum.

1 | Introduction

Facial discoid dermatosis (FDD) is a recently described dermatological condition, rare or under-reported, but highly disfiguring, characterised by persistent annular erythematous and desquamative papules affecting the facial area [1]. The exact aetiology of FDD remains unknown [2]. The diagnosis of FDD is based on a few reproducible criteria: (1) discoid, minimally scaling lesions with a pink orange hue; (2) limited to the face; (3) sudden appearance, then stable over years; (4) treatment resistance. Young or middle-aged persons are affected, which complicates daily life acceptability.

The management of this condition is often challenging due to the differential diagnosis with several other diseases affecting the face, including psoriasis, seborrheic dermatitis, rosacea, and discoid lupus erythematosus. Histopathological findings in most FDD cases may support a relationship with pityriasis rubra pilaris (PRP) [1–3], suggesting it might represent a limited facial form of PRP [2]. We present the case of a 39-year-old male with FDD that severely impacted his quality of life. Over 2 years, he underwent various unsuccessful treatments and had three biopsies, before finally experiencing a rapid and excellent response to calcipotriol/betamethasone [4], a therapeutic agent approved only for psoriasis. We review all FDD cases in the literature through a comprehensive PubMed search from January 2010 to April 2024.

2 | Case Report

A 39-year-old man visited our Dermatology Clinic complaining of persistent facial lesions he had been experiencing for 2 years. Upon examination, we noted well-defined, round, reddish papules and scaly patches on his cheeks, nose, and forehead, ranging in colour from pink to orange and distributed symmetrically (Figure 1). Some lesions exhibited a moist, peripheral detached border. The patient described a sensation of burning rather than itching. Dermoscopic examination revealed a

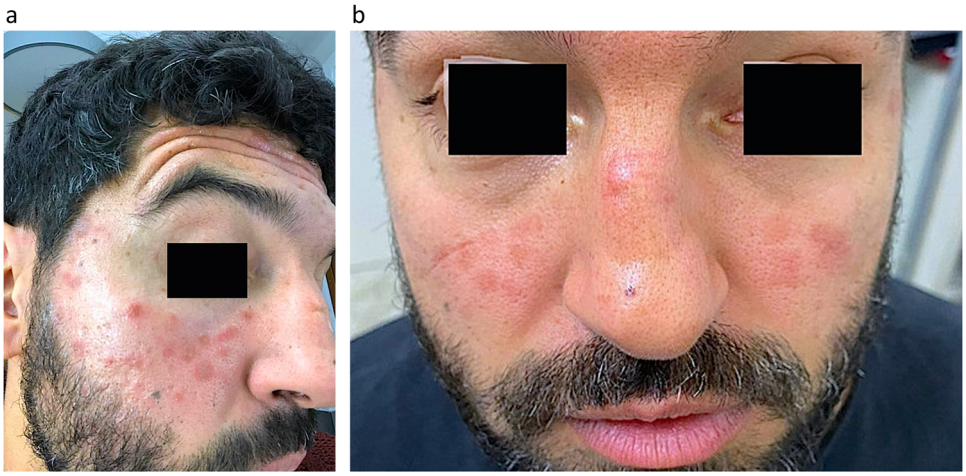

FIGURE 1 | (a) Multiple pink-orange coloured, erythematous, scaly papule over the right cheek. (b) Erythematous and scaly papules on the face.

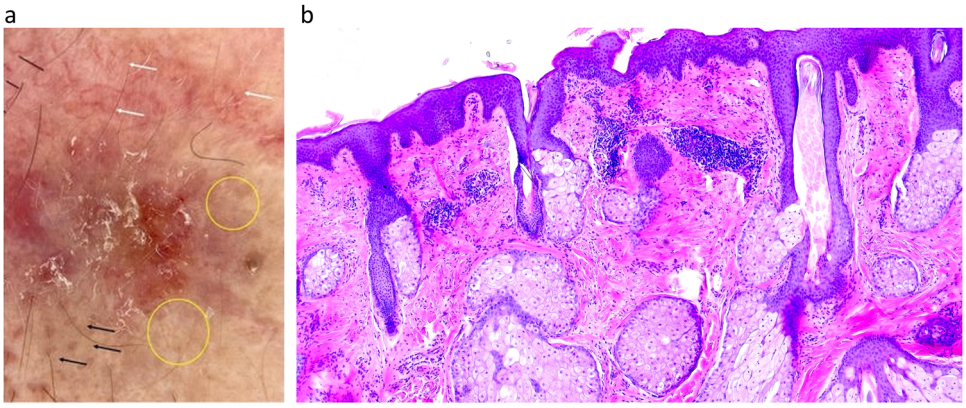

FIGURE 2 | (a) Dermoscopic examination showing brownish red structureless (haemorrhagic) areas, along with white scaling, central erosions, and crusts, focal red dots and follicular plugging suggestive of Lupus Erythematosus. However, at the periphery, some elongated orange-brown follicles with a central white material (black arrow), areas of perifollicular white circles and lines (yellow circle) and polygonal vessels (white arrow) also resembled dermoscopic features of rosacea. (b) Photomicrograph of a skin biopsy specimen from the cheek of the patient presenting spare Demodex mite, psoriasiform hyperplasia with parakeratosis and follicular plugging. (Hematoxylin-eosin stain, magnification x5).

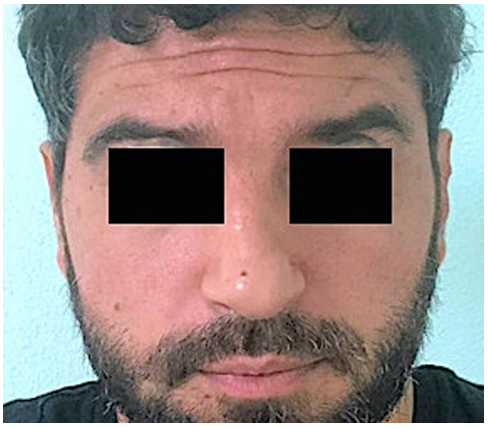

FIGURE 3 | Complete resolution of the lesions.

predominance of varied blood vessels against a brownish-red background, along with white scaling, central erosions, and crusts. Additionally, findings included rosettes and follicular plugs, as well as red dots and white halos surrounding them, which collectively suggested a diagnosis of lupus erythematosus [5]. However, at the periphery, some elongated orange-brown follicles with a central white material (black arrow), areas of perifollicular white circles and lines (yellow circle) and polygonal vessels (white arrow) resembled dermoscopic features of rosacea (Figure 2a) [6].

The patient had previously undergone two biopsies without a conclusive diagnosis, and multiple treatments without success, including topical corticosteroids, calcineurin inhibitors, oral antimalarial drugs, oral doxycycline, metronidazole, ivermectin, and 5% topical permethrin. The lesions persisted, causing significant psychological distress, and impacting his quality of life which was assessed using the Dermatology Quality Life Index resulting in a score of 12. Blood tests for ANA, anti-dsDNA, anti-Smith, anti-Ro/SSA, anti-La/SSB antibodies, and C3 and C4 complement levels were done, all of which returned negative results.

A third biopsy was carried out, which revealed hyperkeratosis, parakeratosis, a preserved granular layer, psoriasiform hyperplasia and dilated follicular ostia with keratotic plugging. A superficial perivascular and perifollicular inflammatory

TABLE 1 | Literature review of all cases.

Reference	Counter	Sex	Age	Site of involvement	Clinical presentation	Histopatology	Direct immunofluoresence	Treatment	Disease course
Ko et al. [1] (3 cases)	1	M	39	Cheeks/ Beard area	Orange-pink papules (4–15 mm) and plaques with scales	Psoriasiform epidermal hyperplasia with follicular plugging	Not reported	Topical CS and calcipotriene	Stable for 15 years
	2	F	11	Right cheek	Discoid, pink, slightly pink	Focal Perifollicular parakeratosis, acanthosis, perivascular	Not reported	Topical CS, ketoconazole, imiquimod, tacrolimus and doxycicline and PDL	Stable for 3 years
	3	F	19	Forehead	Scaly, pink thin plaques	Psoriasiform epidermal hyperplasia with follicular plugging	Not reported	Topical antifungals, tacrolimus, pimecrolimus and tazarotene	Stable for 7 years
Gan et al. [2] (8 cases)	4	F	31	Cheeks, chin	All patients presented with pink to orange discoid, well-defined plaques or patches, scaling was noted in 6 patients, only 2 patients reported itch. The mean number of lesions was 20 each (range 4–50).	All patients presented hyperkeratosis, preserved granular layer or hypergranulosis and acanthosis with psoriasiform hyperplasia. Other common findings included subtle subcorneal acantholysis, "checkerboard" alternating ortho-/ parakeratosis, vacuolated keratinocytes and follicular plugging	Not Reported	Topical CS, tacrolimus, tretinoin	Partial response
	5	F	20	Cheeks, forehead, chin, temple				Topical CS, tacrolimus, topical vitamin D analogues, phototherapy, Oral CS	Partial response

(Continues)

TABLE 1 | (Continued)

Reference	Counter	Sex	Age	Site of involvement	Clinical presentation	Histopatology	Direct immunofluoresence	Treatment	Disease course
	6	F	26	Cheek, chin, ear				Topical CS, tacrolimus, miconazole, imiquimod	Partial response to tacrolimus
	7	F	48	Cheek, forehead, scalp, elbows, knees, palmoplantar keratoderma				Topical CS, tacrolimus, pimecrolimus, topical vitamin D analogue, Oral MTX	Partial response
	8	F	16	Cheek, nose, forehead, chin				Topical CS, tretinoin	Partial response
	9	F	28	Cheek, chin				Topical CS, tacrolimus	Partial response
	10	M	46	Cheek, chin				Topical CS, tacrolimus	Partial response to tacrolimus
	11	F	19	Cheek, nose, chin				Pimecrolimus	No improvement
Salman et al. [3]	12	F	26	Cheeks, chin and forehead				Topical CS, Oral antihistamines, tacrolimus, topical tretinoin and oral antifungals	No improvement
Bohdanowicz and DeKoven [4]	13	F	56	Cheeks, chin	Orange papulosquamous plaques	Parakeratosis, mild psoriasiform acanthosis and perivascular infiltrate of lymphocytes	Not reported	Calcipotriol/ betamethasone with low-dose acitretin	Improvement after 2 months
Rahmatulla [10] (3 cases)	14	M	19	Cheeks and forehead	Orange-pink scaly discoid plaques	Parakeratosis, hyperkeratosis, acanthosis, follicular plugging and lymphocitic	Not reported	Topical CS, oral antifungals, pimecrolimus, phototherapy, acitretin, hydroxychloroquine,	Stable for 8 years

(Continues)

TABLE 1 | (Continued)

Reference	Counter	Sex	Age	Site of involvement	Clinical presentation	Histopatology	Direct immunofluoresence	Treatment	Disease course
						infiltrate in the superficiale dermis		cryotherapy and pulsed dye laser	
	15	F	40	Cheeks	Multiple small discoid erythematous plaques	Hyperkeratosis, acanthosis and dermal lymphocytic infiltrate	Not reported	Topical CS, tacrolimus ointment, phototherapy and hydroxychloroquine	No improvement
	16	F	44	Cheeks	Sclaly, erythematous discoid plaques	Hyperkeratosis, focal parakeratosis, acanthosis, follicular plugging and a dermal lumphocytic infiltrate	Not reported	Topical CS, hydroxychloroquine	No improvement
Condal et al. [7]	17	F	45	Cheeks and forehead	Orange papulo-plaques erythematous desquamtive	Hyperkeratosis, focal parakeratosis, acanthosis, follicular plugging, dermal lumphocytic infiltrate and Demodex mites	Negative	Calcipotriol/ betamethasone	No improvement
Welborn et al. [11]	18	F	44	Right cheek and forehead	Thin, pink, scaly papules	Psoriasiform hyperplasia, parakeratosis, follicular plugging and involuted sebaceous lobules	Not reported	Topical CS, pimecrolimus ointment and metronidazole cream	No Improvement
Allegue et al. [9]	19	M	61	Malar region and nose	Salmon -coloured, erythematous and scaly plaque. Ectropion	Epidermal hyperplasia, parakeratosis, acanthosis with hyperkeratosis, corneal plugs and perivascular lymphocyric infiltrate	Not reported	Calcipotriol/ betamethasone	Improvement after 2 months

(Continues)

TABLE 1 | (Continued)

Reference	Counter	Sex	Age	Site of involvement	Clinical presentation	Histopatology	Direct immunofluoresence	Treatment	Disease course
Rypka [12]	20	F	40	Forehead, cheeks, jawline and neck	Orang-pink, scaly, well-demarcated papules and plaques	Hyperkeratosis with focal parakeratosis, psoriasiform hyperplasia, follicular hyperkeratosis and perivascular lymphocyitic infiltrate	Not reported	Ustekinumab	Improvement after 6 weeks
Amarnani et al. [8]	21	F	48	Cheeks and malar region	Hypopigmented macules and superficial papulosquamous lesions	Normal epidermis, perifolliculitis and postinflammatory pigmentary incontinence at the papillary dermis	Not reported	Calcipotriol/ betamethasone	Improvement after 6 weeks
Current Case	22	M	39	Cheeks, chin and forehead	Pink-orange coloured, erythematous, scaly papule	Hyperkeratosis, parakeratosis, a preserved granular layer, psoriasiform hyperplasia and dilated follicular ostia with keratotic plugging and Demodex Folliculorum	Negative	Calcipotriol/ betamethasone	Improvement after 5 weeks

Abbreviations: CS, corticosteroid; MTX, methotrexate; PDL, pulsed dye laser.

infiltrate made by lymphocytes, histiocytes, plasma cells, and neutrophils was also seen. Numerous *Demodex folliculorum* mites inside the dilated follicles were observed (Figure 2b). Direct immunofluorescence test was negative for IgA, IgG, IgM, and C3. Based on the clinical presentation and the histopathological findings, a diagnosis of facial discoid dermatosis was made.

Treatment with calcipotriol/betamethasone dipropionate ointment, containing 50 mcg of calcipotriol and 0.5 mg of betamethasone dipropionate per gram was begun, based on recent case reports suggesting its efficacy [7–9]. The patient applied the ointment once daily for 4 weeks, followed by a tapering regimen from daily to every other day, and then to twice weekly until discontinuation. No side effects were observed during this period. Remarkably, at the end of the treatment, the facial lesions had almost completely resolved, with only mild residual discoloration and no signs of active inflammation (Figure 3) and after a follow-up period of 18 months, there have been no recurrences.

3 | Discussion

FDD was first described by Ko et al in 2010 [1]. To the best of our knowledge, only 21 cases have been described so far. A synopsis of clinical manifestations, histopathological findings with immunohistochemistry, and treatment approaches from cases reported in the literature are reported in Table 1.

The most extensive retrospective cross-sectional analysis of known cases was described by Gan et al. [2] in 2018 and confirms the highly reproducibility of the presentation: pink to pink-orange well-defined plaques with dry scales, distributed mostly on the forehead, cheeks and chin. The authors concluded that this recalcitrant psoriasiform facial dermatosis is a distinct entity, bearing a resemblance to a fruste form of PRP. Female gender predilection (F:M ratio 22:5) and a wide range from 11 to 61 years has been reported.

Welborn et al. [11] compared all the histopathological features of all the cases described in the literature up to 2019 demonstrating hyperkeratosis, parakeratosis, acanthosis, psoriasiform hyperplasia, follicular plugging and perivascular lymphocytic infiltrate as common features in all biopsies. Some cases, including the current one, have also identified the presence of Demodex folliculorum [7].

In the cohort of patients studied, various treatment modalities were employed to manage FDD. A comprehensive review of the treatments utilised includes topical corticosteroids combined with calcipotriene, ketoconazole, imiquimod, tacrolimus, pimecrolimus and doxycycline, as well as pulsed dye laser therapy. Additional treatments encompassed oral medications such as methotrexate, acitretin, hydroxychloroquine, and oral antihistamines. Only a small percentage of patients achieved significant improvement with these treatments, with the majority exhibiting limited response or no response at all. Notably, topical calcipotriol/betamethasone therapy yielded favourable outcomes in a substantial proportion of cases, highlighting its efficacy as a frontline treatment option for FDD. Ustekinumab, a biologic agent targeting interleukin-12 and -23, demonstrated promising results in managing FDD, suggesting its potential as an alternative therapeutic approach for refractory cases and a potential correlation with PRP [12].

Further research is needed to more precisely characterise this elusive facial dermatitis, which can be highly disfiguring until correctly identified. Although several treatment approaches have been investigated for managing FDD, topical calcipotriol/betamethasone stands out as a particularly effective option.

Author Contributions

Alberto Murtas: writing-original draft, data curation, formal analysis. **Cristina Mugheddu:** data curation, conceptualisation. **Luca Pilloni:** data curation. **Franco Rongioletti:** data curation, validation. **Laura Atzori:** supervision, writing–review and editing. All authors reviewed and approved the final version of the manuscript.

Ethics Statement

All patients in this manuscript have given written informed consent for participation in the study and the use of their deidentified, anonymized, aggregated data and their case details (including photographs) for publication. Ethical approval was not required for this case report as it describes a single clinical case. The report was conducted in accordance with ethical standards, and patient confidentiality was strictly maintained.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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