Received: 5 November 2021 | Revised: 2 May 2022 | Accepted: 28 June 2022

DOI: 10.1111/dth.15679

DERMATOLOGIC THERAPY WILEY

LETTER

Adalimumab biosimilar in a pediatric patient: Clinical and in vivo reflectance confocal microscopy evaluation

Dear Editor,

Psoriasis is a chronic inflammatory skin disease, with a prevalence of 1%–5%.[1] The scalp is the most frequently affected area, up to 79%.[2] Nail psoriasis is also common, involving about 50%.[1] The effectiveness of adalimumab for nail and scalp psoriasis has been demonstrated. Indeed, patients treated with adalimumab, anti-TNFα monoclonal antibody, have reached an improvement of Nail Psoriasis Severity Index (NAPSI) of 60% and of Psoriasis Scalp Severity Index (PSSI) of 100% at week 16, respectively.[3] In vivo reflectance confocal microscopy (RCM) performs a noninvasive, real-time evaluation of the skin, from the epidermis to the papillary dermis, being therefore a useful tool to analyze psoriasis treatment response.[4] RCM has been employed in different dermatologic conditions, such as skin cancers,[5,6] and inflammatory skin conditions.[7] We herein report the first pediatric case of scalp and nail psoriasis, successfully treated with adalimumab biosimilar, followed with dermoscopic and RCM examination.

A 16-year-old male patient with moderate-to-severe psoriasis refractory to topical treatment and cyclosporine was referred to our department. Clinical examination showed psoriatic lesions, mostly on scalp, palms, soles, and severe nail involvement (Figure 1A,C) [Psoriasis Area Severity Index (PASI) = 8.6, body surface area (BSA) = 9.5, PSSI = 30, and NAPSI = 160]. Eighty percentage of scalp area and 20% of palms and soles were affected.

Dermatoscopic evaluation revealed glomerular vessels and whitish interfollicular scales surrounded by an erythematous background in scalp lesions (Figure 1E) while pitting and multiple splinter hemorrages were found in nails (Figure 1G). RCM of nail lesions revealed delamination of the nail plate presenting as hyperreflective areas and hyporeflective circles that likely correspond to nail pitting (Figure 1K). Moreover, RCM of the scalp revealed parakeratosis, atypical, honeycombed pattern, and inflammatory cells on the superficial layer, and the presence of papillomatosis with hypervascularization at the dermal-epidermal junction (Figure 1I). Due to failure of previous therapies, the patient was screened for biological treatment. Adalimumab biosimilar was chosen due to the indication after 4 years of age and efficacy in nail and scalp psoriasis.[3]

At 12-week follow-up, significant improvement was observed. PASI75 (75% reduction of baseline PASI) and PSSI90 (90% reduction of baseline PSSI) were achieved, BSA decreased to 1%, and NAPSI to 14. RCM confirmed the improvement of scalp and nails conditions but failed to show a normal conformation. At 24 weeks, PASI100 was achieved, and nail psoriasis completely resolved (NAPSI = 0) (Figure 1B,D). RCM confirmed resolution of the lesions with a return to normal dermal papillae configuration with a rim of bright basal keratinocytes and a normal display of the nail plate with some stellate figures corresponding to epidermal keratinocytes sectioned obliquely and regular honeycombed pattern of the epidermis (Figure 1J,L). Psoriasis resolution was confirmed at dermoscopy which did not reveal any alteration (Figure 1F,H).

Nail and scalp psoriasis are difficult to treat and cause severe quality of life impairment.[8] The evaluation of psoriasis severity through RCM is a useful tool to investigate not only clinical but also subclinical changes, as suggested for the first time by Ardigò et al. in 2013.[9] Then, a recent study tried to evaluate the RCM improvement of 48 patients with psoriasis, but scalp and nails lesions were excluded from the assessment.[10]

To the best of our knowledge, this is the first case of an adolescent patient with nail and scalp psoriasis successfully treated with adalimumab biosimilar and followed by RCM evaluation. RCM is a promising instrument for monitoring nail and scalp psoriasis. RCM provides the means for an early diagnosis, even before clinical manifestations, making a timely therapeutic intervention possible. Also, it helps evaluate therapeutic efficacy and the need of treatment continuation even when clinically a complete response has been found. It is a useful tool for the detection of early phases of the disease and for therapeutic monitoring.

AUTHOR CONTRIBUTIONS

Matteo Megna: conceptualization, validation, visualization, writing-original draft preparation, writing - review & editing. **Alessia Villani**: conceptualization, validation, visualization, writing-original draft preparation, writing - review & editing. **Luca Potestio**: data curation, formal analysis, investigation, visualization, writing-original draft preparation. **Elisa Camela**: data curation, investigation, methodology, visualization, writing-original draft preparation. **Gabriella Fabbrocini**: conceptualization, validation, visualization, writing-review & editing, supervision. **Sonia Sofia Ocampo-Garza**: conceptualization, validation,

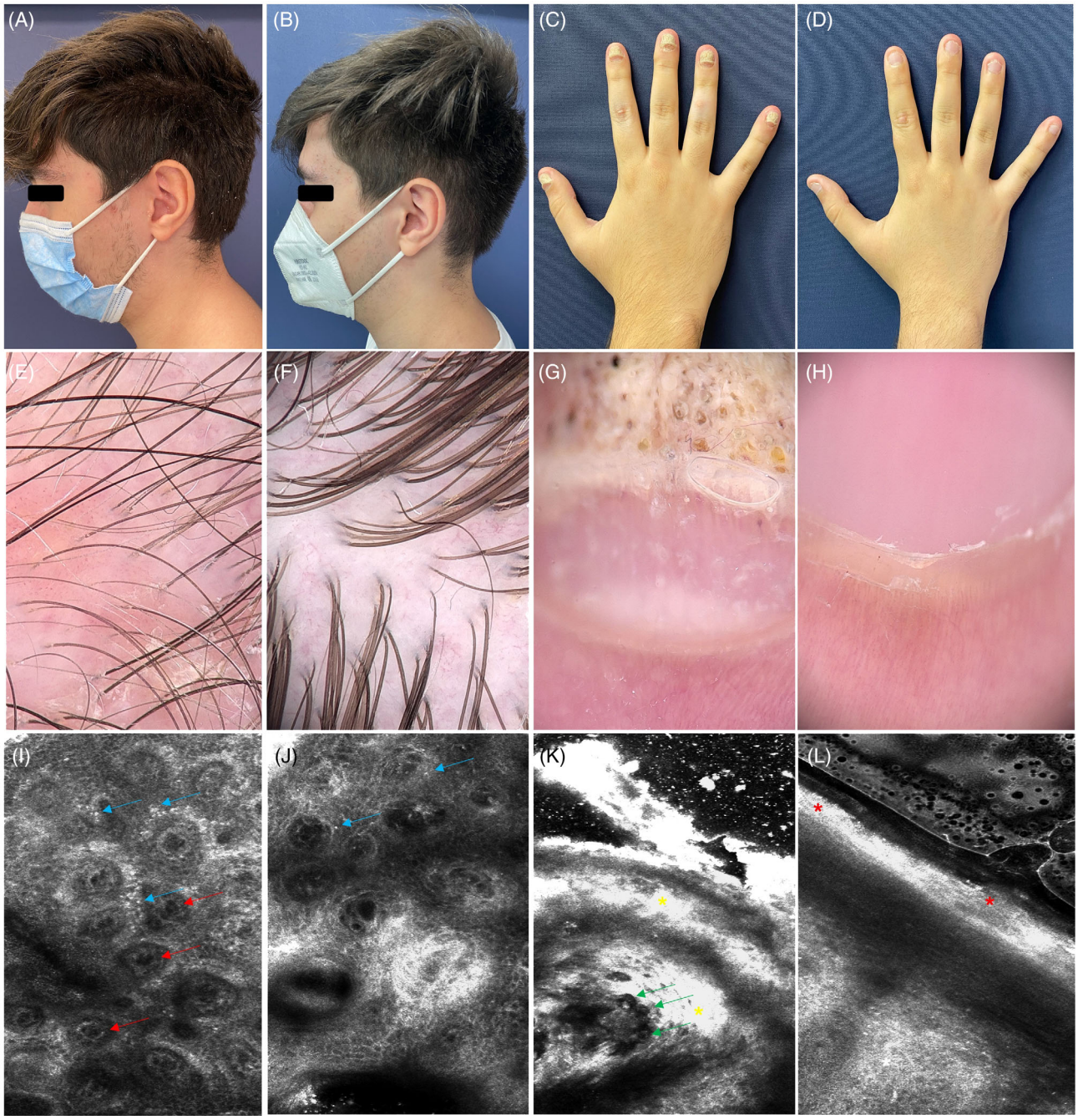

FIGURE 1 (A) Baseline clinical image of the patient showing erythematous, silvery, scaly plaques involving 80% of the scalp. (B) Clinical image at week 24 with complete remission of scalp lesions. (C) Baseline clinical image of the right hand nails showing pitting, oil spots, and splinter hemorrhages in the proximal fold with distal trachyonychia. (D) Clinical image of the right-hand nails at week-24 showing a complete response. (E) Trichoscopic image of scalp psoriasis, which reveals an erythematous background with whitish interfollicular scales and glomerular vessels (Fotofinder ATBM Master 20×). (F) Trichoscopic image of the patient after 24 weeks of treatment with arborizing vessels (Fotofinder ATBM Master 20×). (G) Dermoscopic image of nail psoriasis, showing pitting and subungueal hyperkeratosis with multiple splinter hemorrages (Fotofinder ATBM Master 20×). (H) Dermoscopic image of the nail plate showing a complete response after therapy (Fotofinder ATBM Master 20×). (I) RCM image of the scalp. The dermo-epidermal junction presented nonrimmed enlarged dermal papillae (DP) with dilated vessels (red arrow) and inflammatory cells (blue arrow) (VivaCam 3000). (J) RCM of the scalp after 24 weeks of treatment showing a normal DP configuration and few inflammatory cells (blue arrow) (VivaCam 3000). (K) RCM of nail psoriasis, hyperreflective irregular areas that correspond to delamination of the nail plate (yellow asterisk) and hyporeflective circles that likely correspond to nail pitting was observed (green arrow) (VivaCam 3000). (L) RCM of the nail plate after treatment with adalimumab biosimilar, showing a normal display with some stellate figures that correspond to epidermal keratinocytes sectioned in an oblique manner (red asterisk) and normal honeycombed pattern of the epidermis (white asterisk) (VivaCam 3000)

visualization, writing-original draft preparation, writing - review & editing.

ACKNOWLEDGMENTS

All authors read and approved the final version of the manuscript. Open Access Funding provided by Universita degli Studi di Napoli Federico II within the CRUI-CARE Agreement.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

PATIENT CONSENT

The authors have obtained the consent of the patient for clinical images.

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REFERENCES

1. Griffiths CEM, Armstrong AW, Gudjonsson JE, Barker JNWN. Psoriasis. *Lancet*. 2021;397:1301-1315.
2. Camela E, Ocampo-Garza SS, Cinelli E, et al. Therapeutic update of biologics and small molecules for scalp psoriasis: a systematic review. *Dermatol Ther*. 2021;34:e14857.
3. Thaçi D, Unnebrink K, Sundaram M, Sood S, Yamaguchi Y. Adalimumab for the treatment of moderate to severe psoriasis: subanalysis of effects on scalp and nails in the BELIEVE study. *J Eur Acad Dermatol Venereol*. 2015;29:353-360.4.
4. Mehrabi JN, Baugh EG, Fast A, et al. A clinical perspective on the automated analysis of reflectance confocal microscopy in dermatology. *Lasers Surg Med*. 2021;53:1011-1019.
5. Pellacani G, Guitera P, Longo C, Avramidis M, Seidenari S, Menzies S. The impact of in vivo reflectance confocal microscopy for the diagnostic accuracy of melanoma and equivocal melanocytic lesions. *J Invest Dermatol*. 2007;127:2759-2765.
6. Lacarrubba F, Ardigò M, Di Stefani A, et al. Dermatoscopy and reflectance confocal microscopy correlations in nonmelanocytic disorders. *Dermatol Clin*. 2018;36:487-501.
7. Agozzino M, Gonzalez S, Ardigò M. Reflectance confocal microscopy for inflammatory skin diseases. *Actas Dermosifiliogr*. 2016;107:631-639.
8. Lanna C, Galluzzi C, Zangrilli A, et al. Psoriasis in difficult to treat areas: treatment role in improving health-related quality of life and perception of the disease stigma. *J Dermatolog Treat*. 2020;28:1-4.
9. Ardigò M, Agozzino M, Longo C, et al. Psoriasis plaque test with confocal microscopy: evaluation of different microscopic response pathways in NSAID and steroid treated lesions. *Skin Res Technol*. 2013;19(4):417-423.
10. Ardigò M, Agozzino M, Longo C, et al. Confocal microscopy for plaque psoriasis therapeutic follow-up during an anti-TNF-α monoclonal antibody: an observational multicenter study. *J Eur Acad Dermatol Venereol*. 2015;29(12):2363-2368.