

A report on applying digital epiluminescence dermoscopy to guide topical treatment for generalised vitiligo

Keywords: depigmentation, hypopigmentation, interfollicular, perifollicular

Abstract

We have reported on utilising digital epiluminescence dermoscopy to detect the sparing of perifollicular pigments in localised vitiligo. These spotty zones might be the most acute autoimmune battle line.

We saw a 68-year-old gentleman with five-year history of segmental/generalised vitiligo. He declined systemic treatments. These spotty zones mentioned above were identified by epiluminescence dermoscopy. We advised him to apply a very potent topical corticosteroid two times per week to these zones. Much improvement was seen in two months. Complete remission was achieved in another two months.

We discussed on the roles of epiluminescence dermoscopy on the diagnosis and treatments of patients with all types of vitiligo where the perifollicular pigment sparing zones were too small to be identifiable by naked eyes.

List of abbreviations

Abbreviations	Full terms
GV	Generalised vitiligo
DED	Digital epiluminescence dermoscopy
QOL	Quality of life

Introduction

Generalised vitiligo (GV) is a disfiguring disease affecting the self image, daily life, and many social issues of sufferers.¹ We have previously reported on the application of digital epiluminescence dermoscopy (DED) in detecting the sparing of perifollicular pigments in localised vitiligo.² Such pattern should be the most acute autoimmune battle line between involved and uninvolved skin. We report here a patient with generalised vitiligo treated by DED-guided topical treatment.

Patient Report

A 68-year-old gentleman attended our care for five-year-long period of a generalised depigmented disease affecting his trunk and four extremities. He was suffering from systemic hypertension on an angiotensin receptor blocker, diabetes mellitus on oral hypoglycaemic agents, and dyslipoproteinaemia on a statin. He was an ex-smoker having ceased five years ago. He was a social drinker. Examination revealed a band of depigmentation running in a transverse orientation on the anterior abdominal wall, inferior to the umbilicus (Figure 1a). One would make a diagnosis of segmental vitiligo when the truncal part of Figure 1a was noticed. However, clear inspection would reveal depigmented patches on the right hand and fingers.



Figure 1a Segmental/generalised vitiligo in a male subject with spotty zones visible to naked eyes.

His scalp, face, and back were relatively devoid of patches of depigmentation. His neck and both axillae were involved, with the right axilla shown in Figure 1b.



Figure 1b Further depigmented areas with sharp and angulated margins in the right axilla and right lateral trunk. Spots which were perifollicular pigment-sparing regions can be seen with naked eyes.

38

39 The patient volunteered that it was not his truncal and axillary lesions that particularly
40 affected his self image and quality of life. It was his two hands which were troubling him, as
41 depicted in Figure 1c. He could not shake hands with people in this physical appearance.



Figure 1c Depigmented lesions with sharp margin on the dorsa of hands, thumbs, and fingers.

42

43 Figures 1a and 1b also demonstrate the peculiar dotted pigments at lesional edges. The
44 corresponding dermoscopic appearances were highlighted as Figure 2a and 2b respectively.
45 Both were taken with high-magnification by digital epiluminescence dermoscopy with the
46 level of cross-polarisation set to ten (level 1: no cross-polarisation; level 12: highest cross-
47 polarisation for our equipment).

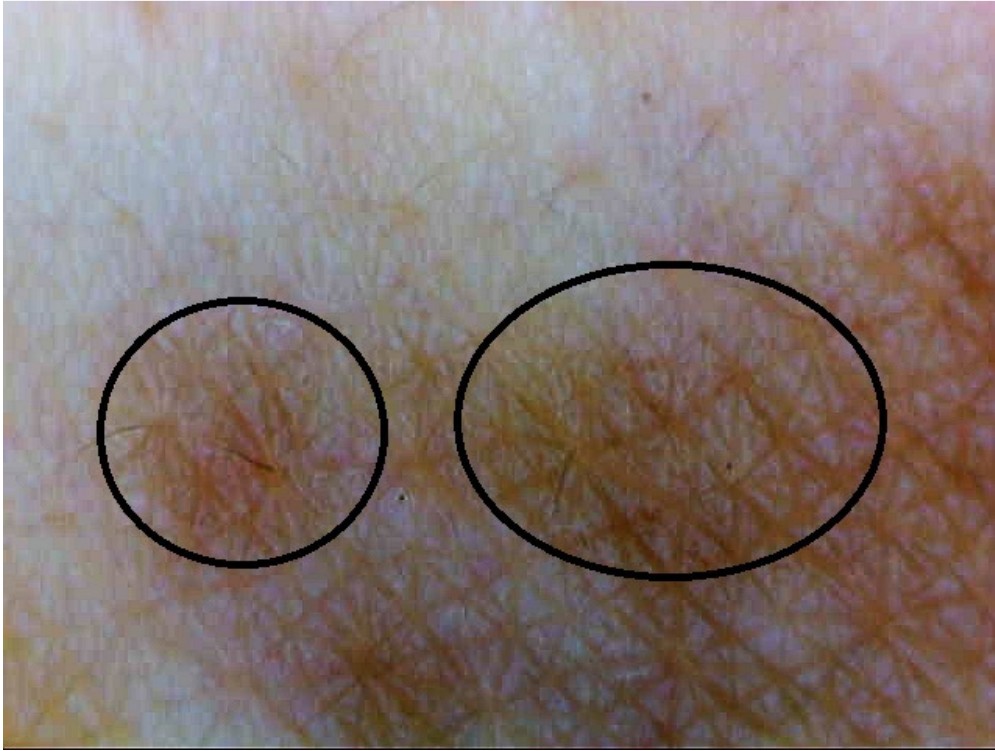


Figure 2a Two patches of pigmented skin in the pigmented vs depigmented areas. The areas of perifollicular sparing of depigmentation are outlined in black.

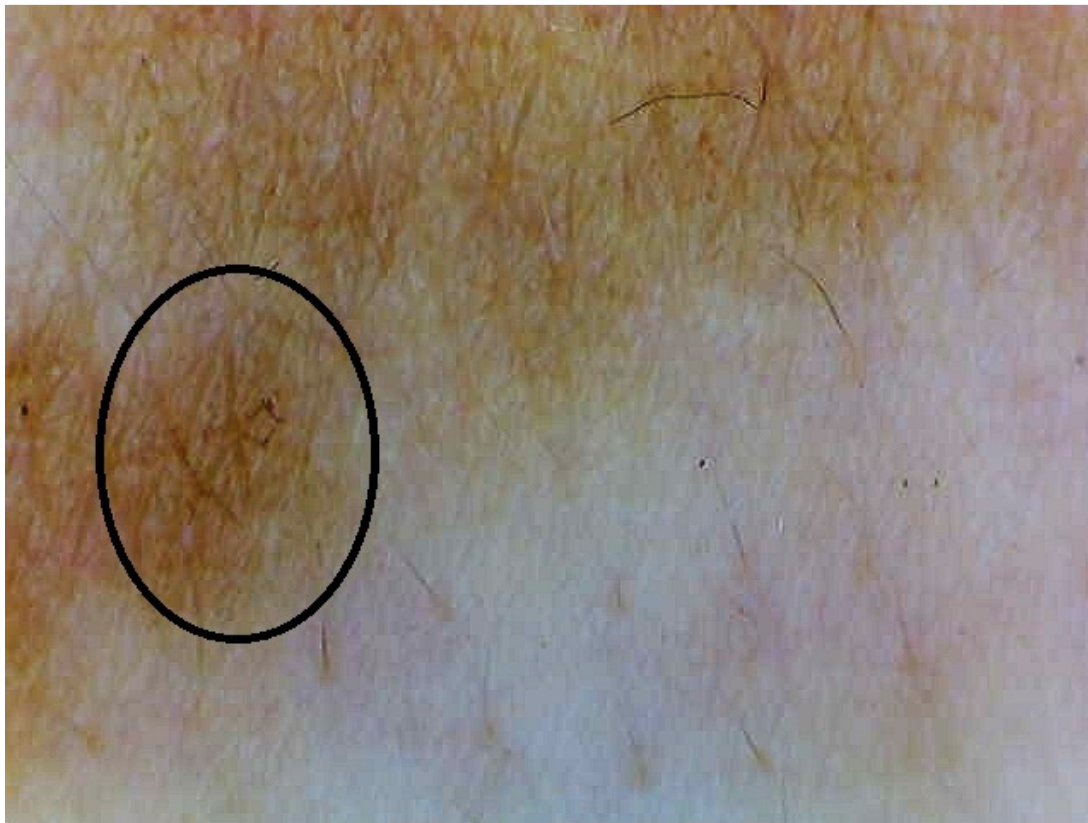


Figure 2b One more example of sparing of perifollicular pigments. The area of perifollicular sparing of depigmentation is outlined in black.

48 There was no laboratory abnormality in his routine tests.

49 The patient declined systemic treatments. As we believe that the system-specific
 50 autoimmunity in vitiligo should be most active in the zones with depigmented interfollicular
 51 pigments and spared perifollicular pigments, we advised him to apply topical corticosteroid
 52 to the most active areas of the disease. The dose was 0.05% clobetasol propionate
 53 (DermovateTM) ointment, to be applied twice weekly. We took several clinical photos
 54 covering the trunk and limbs of the patient, examined him with DED, marked the transitional
 55 sites on the image files, printed the images, handed such to him, and advised him to apply
 56 the ointment on the sites marked.

57 We saw the patient every month. Two months later, much progress was seen (Figures 2a –
 58 2b). Almost all battlefield lines were reclining from the pigmented zones to the dotted zones
 59 and to the depigmented zones. Improvements for all skin areas, shown or not shown in
 60 Figures 3a, 3b, and 3c were startling. The patient was already feeling comfortable to offer
 61 handshakes to other people.



Figure 1a (For comparison) Segmental/generalised vitiligo in a male subject with spotty zones **visible to naked eyes.**



Figure 3a Upon application of highly potent topical corticosteroids for two months, repigmentation was in definite progress. Please compare this with Figure 1a.



Figure 1b (For comparison) Further depigmented areas with sharp and angulated margins in the right axilla and right lateral trunk. Spots which were perifollicular pigment-sparing regions can be seen with naked eyes.



Figure 3b Previous lesions of vitiligo on the right axilla and right lateral aspect of trunk largely remised. Please compare this with Figure 1b.



Figure 1c (For comparison) Depigmented lesions with sharp margin on the dorsi of hands, thumbs, and fingers.



Figure 3c To the patient with generalised vitiligo, disease remission was most pertinent on his hands, thumbs, and fingers as he could not have a handshake with other people. Please compare this with Figure 1c.

The topical corticosteroids were completely stopped one month later. Virtually all traces of PV were gone then. Unfortunately, clinical photos showing complete remission were not available.

Discussion

Vitiligo – any type concerned – casts significant impacts on the quality of life (QOL) of patients.¹ The presence of lesions on the visible parts and the extensiveness of lesions was reported to be significantly associated with impairments in QOL.³ Specific scales are now in place to assess the impact of vitiligo on the QOL of individual patients.⁴⁻⁶

Topical and systemic treatments are available for vitiligo. Such depends on many factors, not necessarily on the percentage of skin surface affected *per se*. Our patient expressed his wish not to embark on systemic treatment. We thus prescribed a potent corticosteroid for him to apply twice per week. This was a highly important decision to make, catering for the efficacy and potential adverse effects of the drug. We would like to focus the topical treatment to the most active areas of the disease. These sites were most likely at the transitional sites with sparing of the perifollicular melanocytes. We therefore advised the patient to apply the fluorinated corticosteroid mainly on these sites.

Applying corticosteroids twice a week is unusually low. We elected to commence on this low dosage owing to our experience for other patients with marginal or non-marginal vitiligo. The progress of the patient is clearly shown if one compares Figure 1a and Figure 3a, Figure 2a and Figure 3a, and Figure 1c against Figure 1c. Yes, there existed an element of spontaneous remission by the deactivation of the organ-specific-auto-immunological system of the patient. However, the timing of two months was too short for the re-pigmentation to be attributed to endogenous factors. We thus postulate, with qualitative substantiation, that the remission was related to an exogenous factor – topical corticosteroids.

However, the affected body area of the patient was extensive. Having had a highly potent corticosteroid prescribed, we harboured a valid concern – cutaneous absorption leading to adverse effects systemically. This was particularly important as he was suffering from diabetes mellitus. We therefore advised the patient to apply the ointment mainly to the transitional zone with sparing of perifollicular pigments. We based this piece of advice on biological plausibility.

This plausibility rests with the hypothesis that there exists two populations of melanocytes – perifollicular ones and interfollicular ones. For some unknown reasons, the autoimmunity – likely to be cell-mediated – invades the interfollicular melanocytes first, before attacking the perifollicular melanocytes. In the transitional zone, the perifollicular pigments are therefore still intact, while the interfollicular pigments are already gone.^{7,8} This is the underlying mechanism for the dotted zone to be seen, and why we advised our patient to apply the medication to this zone.

We put DED into the picture here for two reasons. Firstly, for some patients with early or focal vitiligo, the presence of such perifollicular sparing pattern cannot be appreciated by naked eyes. DED would then be applied to confirm or to refute a diagnosis of vitiligo.² Secondly, while the perifollicular pigment-sparing dots were largely visible by the naked eyes for this patient, this is not the case for many other patients. In these circumstances, we could perform DED, mark such by skin pencils, take and print clinical photos, then release the patient home to apply corticosteroids accordingly. Figure 4 depicts the back of a patient with GV, with perifollicular sparing configuration largely invisible to the naked eyes. These areas were detected by DED (on the upper parts of the lesion) and annotated by dark ovals.



Figure 4 The back of another patient with generalised vitiligo. Only epiluminescence dermoscopy can locate the zones of perifollicular sparing of depigmentation. These areas were detected by digital epiluminescence dermoscopy (on the upper parts of the lesion), and annotated by dark ovals.

Dermoscopy is increasing being applied to diagnose and assess skin diseases other than melanomas or other malignant diseases. It has been reported that dermoscopy increases the efficacies in diagnosing common inflammatory diseases including plaque psoriasis,^{9,10} lichen planus (Lopez),⁹ pityriasis rosea,^{10,11} and lichen planus.¹⁰ Dermatoscope has also been reported to be applicable in diagnosing vascular and infectious diseases.¹² We have previously reported the first applications of DED to assist in the diagnosis of pityriasis rosea,¹¹ pseudofolliculitis,¹³ condyloma acuminata,¹⁴ pediculosis pubis,¹⁵ and pearly penile papules.¹⁶ However, these reports only covered the application of DED for diagnostic purposes. For this report, the use of DED directly assisted the treatment of the patient. Currently, we have already been performing DED-guided micro-surgeries, and hope to be able to report such in the not too distant future.

Conclusion

DED-guided topical treatment for GV seems to be effective for a patient with generalised vitiligo. This treatment method might be particularly beneficial for patients with small perifollicular pigment-sparing zones. Further studies including randomised controlled trials would be necessary to confirm the efficacy of this approach.

Consent Disclaimer:

126 As per international standard or university standard, patient's written consent has been
127 collected and preserved by the author(s).
128
129

References

1. Morales-Sánchez MA, Vargas-Salinas M, Peralta-Pedrero ML, Olguín-García MG, Jurado-Santa Cruz F. Impact of vitiligo on quality of life. *Actas Dermosifiliogr*. 2017; 7310(17): 30178-3.
2. Chuh AA, Zawar V. Demonstration of residual perifollicular pigmentation in localized vitiligo – a reverse and novel application of digital epiluminescence dermoscopy. *Comput Med Imaging Graph*. 2004; 28(4): 213-7.
3. Bae JM, Lee SC, Kim TH, Yeom SD, Shin JH, Lee WJ *et al*. Factors affecting the quality of life in patients with vitiligo: A nationwide study. *Br J Dermatol*. 2017 doi: 10.1111/bjd.15560. [Epub ahead of print]
4. Hedayat K, Karbakhsh M, Ghiasi M, Goodarzi A, Fakour Y, Akbari Z, *et al*. Quality of life in patients with vitiligo: a cross-sectional study based on Vitiligo Quality of Life index (VitiQoL). *Health Qual Life Outcomes* 2016; 14: 86.
5. Hamzavi I, Jain H, McLean D, Shapiro J, Zeng H, Lui H. Parametric modelling of narrowband UV-B phototherapy for vitiligo, using a novel quantitative tool: the Vitiligo Area Scoring Index. *Arch Dermatol* 2004;140(6): 677–83.
6. Taïeb A, Picardo M, VETF Members. The definition and assessment of vitiligo: a consensus report of the Vitiligo European Task Force. *Pigment Cell Melanoma Res* 2007; 20(1): 27–35.
7. Taïeb A. Intrinsic and extrinsic pathomechanisms in vitiligo. *Pigment Cell Res* 2000; 13 Suppl 8: 41-7.
8. Parsad D, Kanwar AJ, Kumar B. SP-20 repigmentation patterns and their co-relation with different treatment modalities, speed and stability of pigmentation in 352 vitiliginous patches. *Pigment Cell Res* 2003; 16: 587.
9. Vázquez-López F, Manjón-Haces JA, Maldonado-Seral C, Raya-Aguado C, Pérez-Oliva N, Marghoob AA. Dermoscopic features of plaque psoriasis and lichen planus: new observations. *Dermatology* 2003; 207(2): 151-6.
10. Lallas A, Kyrgidis A, Tzellos TG, Apalla Z, Karakyrriou E, Karatolias A, *et al*. Accuracy of dermoscopic criteria for the diagnosis of psoriasis, dermatitis, lichen planus and pityriasis rosea. *Br J Dermatol*. 2012; 166(6): 1198-205.
11. Chuh AAT. Collarette scaling in pityriasis rosea demonstrated by digital epiluminescence dermatoscopy. *Australas J Dermatol* 2001; 42(4): 288-90.
12. Zalaudek I, Argenziano G, Di Stefani A, Ferrara G, Marghoob AA, Hofmann-Wellenhof R, *et al*. Dermoscopy in general dermatology. *Dermatology* 2006; 212(1): 7–18.
13. Chuh A, Zawar V. Epiluminescence dermatoscopy enhanced patient compliance and achieved treatment success in pseudofolliculitis barbae. *Australas J Dermatol* 2006; 47(1): 60-2.
14. Chuh AA, Wong WC, Lee A. Sexually transmitted infections – ten common myths. *Aust Fam Physician* 2006; 35(3): 127-9.
15. Chuh A, Lee A, Wong W, Ooi C, Zawar V. Diagnosis of pediculosis pubis: a novel application of digital epiluminescence dermatoscopy. *J Eur Acad Dermatol Venereol* 2007; 21(6): 837-8.
16. Chuh A, Zawar V. Videodermoscopy of pearly penile papules. Case reports. *Nasza Dermatologia Online J* 2015; 6(1): 29-31.