

Videocapillaroscopy in the Differential Diagnosis between Psoriasis and Seborrheic Dermatitis of the Scalp

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Key Words

Psoriasis · Seborrheic dermatitis · Videocapillaroscopy

Abstract

Background: Videocapillaroscopy (VCP) can be used to explore microcirculatory modifications in skin diseases. Psoriasis shows specific capillary alterations reflecting typical histopathological changes. **Objective:** To compare capillary morphology, distribution and density in psoriasis and seborrheic dermatitis of the scalp for differential diagnosis. **Methods:** VCP was performed on histology-confirmed scalp lesions of 30 patients with chronic plaque psoriasis, 30 age- and sex-matched patients with seborrheic dermatitis and 30 healthy subjects. The morphology, mean density per mm² and mean diameter of capillary loops was measured. **Results:** Scalp psoriasis exhibited homogeneously tortuous and dilated capillaries (bushy pattern), with a $73 \pm 17 \mu\text{m}$ (mean \pm standard deviation) diameter of capillary bushes. In contrast, scalp seborrheic dermatitis presented a multi-form pattern, with mildly tortuous capillary loops and isolated dilated capillaries, but a substantial preservation of local microangioarchitecture. Mean diameter of capillary bush was significantly lower ($27 \pm 4 \mu\text{m}$; $p < 0.001$) and similar to that of the scalp of healthy subjects ($21 \pm 5 \mu\text{m}$). Capillary loop density was similar in patients with psoriasis ($23 \pm 5/\text{mm}^2$) seborrheic dermatitis ($24 \pm 2/\text{mm}^2$) and healthy scalp

skin ($24 \pm 3/\text{mm}^2$). **Conclusion:** VCP could be a useful non-invasive approach for differentiating between psoriasis and seborrheic dermatitis, especially when the scalp is the only affected site.

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Introduction

Capillaroscopy is a noninvasive technique well suitable for analyzing cutaneous microcirculation. It is used on nailfold and conjunctiva microcirculation to diagnose and monitor microvessel alterations in rheumatologic and systemic disorders including scleroderma, dermatomyositis, Raynaud's phenomenon, diabetes and hypertension [1, 2]. Videocapillaroscopy (VCP) uses an optical fiber probe connected to a microvideotelecamera, and allows morphologic and functional analysis of microcirculation at all cutaneous sites. VCP has been used for analyzing cutaneous microcirculation in skin diseases such as erythematotelangiectatic rosacea [3] and psoriasis [4, 5]. Psoriasis is a chronic inflammatory disease that involves cutaneous vessels, with the presence of elongated and dilated capillaries in the papillary dermis [6–8]. Psoriasis capillary changes determine a specific VCP pattern characterized by the presence of bushy or clew capillaries [1, 4, 5]. Psoriasis and seborrheic dermatitis can be diffi-

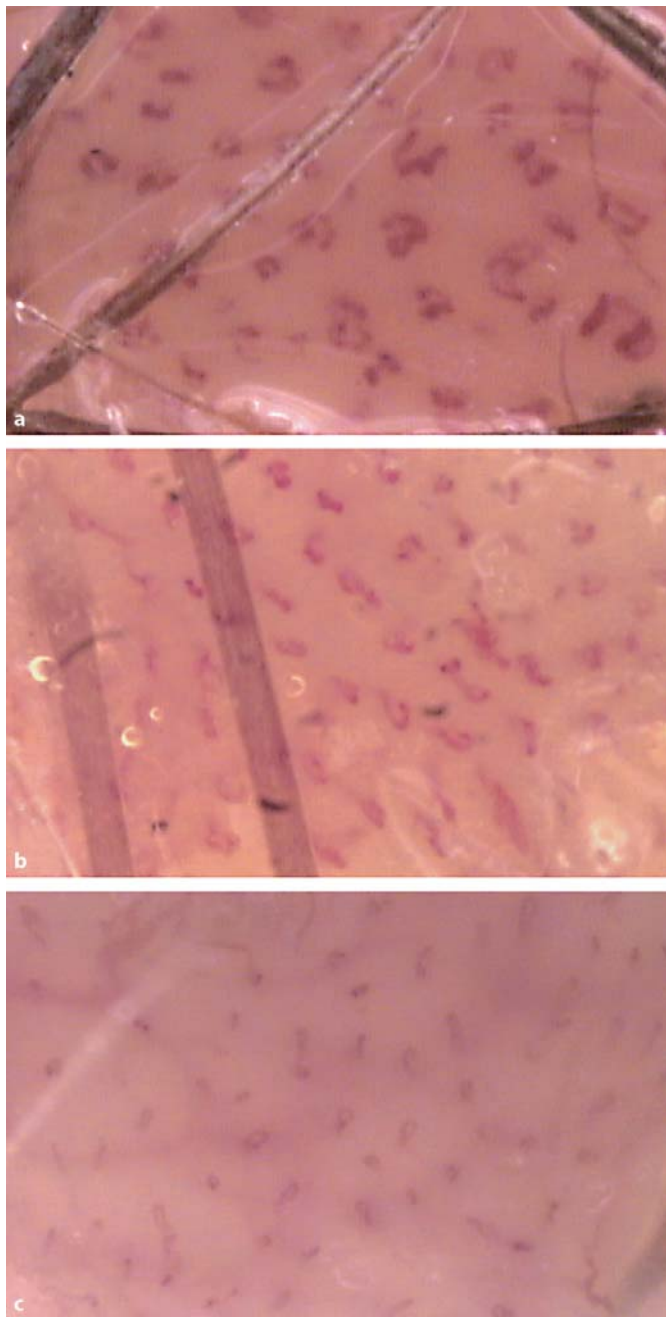


Fig. 1. VCP appearance of capillary loops in lesional scalp psoriasis (a), lesional scalp seborrheic dermatitis (b) and normal scalp skin of healthy subjects (c). 200 \times magnification.

cult to differentiate clinically, especially when lesions are confined to the scalp. In this study, we employed VPC to compare capillary morphology, distribution and density in psoriasis and seborrheic dermatitis of the scalp for differential diagnosis.

Materials and Methods

Thirty patients with scalp psoriasis (18 females and 12 males; median age 40, range 23–60 years), 30 patients with scalp seborrheic dermatitis (18 females and 12 males; median age 47, range 25–65 years) and 30 healthy subjects (18 females and 12 males; median age 43, range 22–58 years) were included in the study. In all patients, diagnosis was confirmed by histology on a 3-mm punch biopsy, after informed consent was obtained. Psoriasis and seborrheic dermatitis have many histopathologic features in common, including psoriasiform hyperplasia with mounds of parakeratosis containing neutrophils, and a lymphocytic infiltrate in the superficial dermis with limited exocytosis [7, 9]. The most relevant criteria for diagnosing seborrheic dermatitis is the presence of spongiosis within infundibula and rete ridges, and plasma-rich mounds of parakeratosis situated especially at the tips of follicular ostia [7, 9]. Patients included in the study had no associated microangiopathic disease, including diabetes and connective vascular diseases. Patients did not undergo any topical or systemic treatment in the month before examination. VCP was performed using an optical probe (Videocap 200® DS Medica, Milano, Italy) consisting of a main unit, an optical fiber probe with video-optical terminal, a 'contact' and no-contact lenses, and a high-resolution color TV micro-camera at 200 \times magnification. All patients waited for 30 min in a temperature (22°C) and humidity (35–40%) controlled waiting room before examination. Patients were also asked to avoid alcoholic beverages and not to smoke for 24 h before measurement. Psoriatic scales were removed with a lancet or with 5% salicylic acid in petrolatum for 1 day before examination. VCP was performed by the same investigator (A.G.) applying a drop of cedar oil to improve skin translucency and capillary visibility. All subjects were resting in a supine position during examination. Lesional and nonlesional skin was analyzed in blind by another investigator (M.R.Z.) by measuring capillary bush diameter (μ m) and capillary loop number (loop density) present on three different fields of 1 mm² each. Results are presented as mean \pm standard deviation (SD). The unpaired Student's *t* test was used to compare differences that were considered significant when *p* < 0.05.

Results

Patients included in the study had psoriasis or seborrheic dermatitis affecting the scalp. Twenty-eight patients with psoriasis had also typical psoriasis lesions elsewhere, and 2 patients had a history of psoriasis lesions at typical sites. Twenty-two patients with seborrheic dermatitis of the scalp had also concurrent similar lesions in other seborrheic areas (eyebrows, nasolabial fold, chest), whereas 8 patients had a history of seborrheic dermatitis lesions at typical sites. Scalp psoriasis presented a homogeneous pattern with tortuous and dilated capillaries (appearing as bushes or clews) and a completely disarranged micro-angioarchitecture (fig. 1a). The capillary loops had identical 'bushy' morphology in all scalp locations. In con-

trast, in scalp seborrheic dermatitis there were mildly tortuous capillaries and only isolated 'bushy' capillaries (fig. 1b) with a conserved local microangioarchitecture similar to healthy scalp skin (fig. 1c). VCP analysis showed that in lesional psoriasis skin the diameter of capillary bush was significantly ($p < 0.001$) greater than in scalp skin affected by seborrheic dermatitis or in healthy scalp skin (fig. 2a). In contrast, capillary loop density was similar in all three conditions (fig. 2b). Normal-looking skin of patients with psoriasis or seborrheic dermatitis did not show significant changes compared to normal skin of healthy subjects.

Discussion

Psoriasis is a common inflammatory skin disease characterized by thickened epidermis and inflammatory changes. In addition, elongated, tortuous and dilated capillaries are present in the papillary dermis [6, 8]. Accordingly, blood flow in lesional skin is substantially elevated compared with clinically uninvolved skin of the same subject and normal skin of unaffected individuals [10–12]. These microvascular changes occur early in the development of lesions, before epidermal hyperplasia can be detected clinically or histologically, and represent a potential therapeutic target [10, 12]. It is still not entirely clear what causes the microcirculatory changes in psoriatic skin. Epidermal keratinocytes, mast cells, monocytes as well as neutrophils are important sources of angiogenic factors, which include vascular endothelial growth factor, angiopoietins, transforming growth factor- α , interleukin-8 and platelet-derived endothelial cell growth factor. Vascular endothelial growth factor is particularly overexpressed in psoriatic epidermis as are its receptors on lesional psoriatic microvasculature, and is primarily involved in angiogenesis [13–15]. Angiopoietins 1 and 2 and their receptor Tie 2 are also upregulated in lesional skin, and mostly involved in the stabilization of blood vessels, once formed [15].

The lesions of seborrheic dermatitis may closely resemble clinically those of psoriasis. Their distribution is generally different, but when lesions are confined to the scalp and are long-standing even histology may hardly differentiate the two conditions [7, 16]. Distinction of seborrheic dermatitis from psoriasis is obviously relevant for the long-term prognosis, but it may be particularly important in patients with arthritis symptoms. In fact, the presence of skin psoriasis is the most relevant criteria for the diagnosis of psoriatic arthritis [17], and deciding

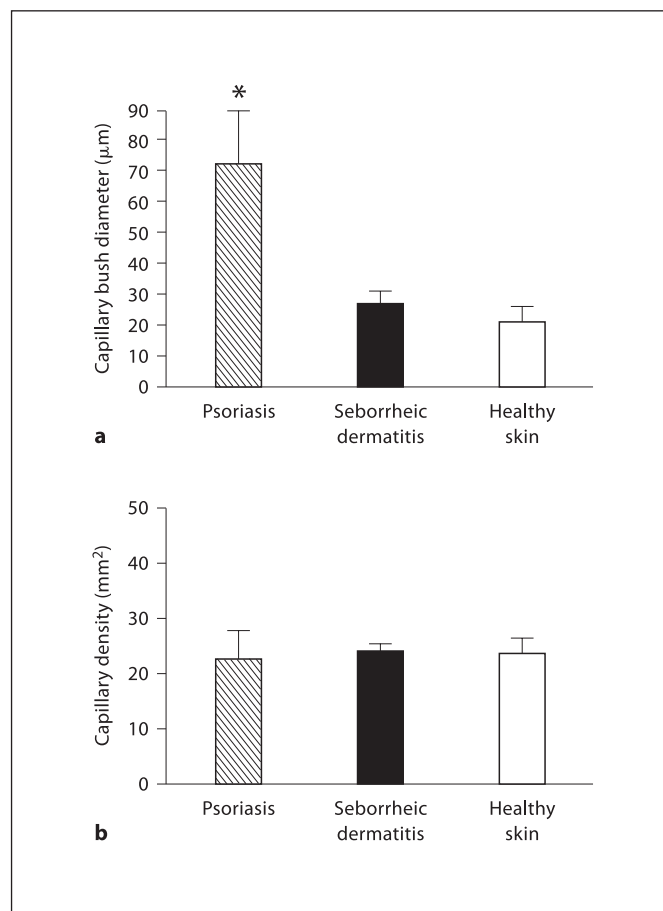


Fig. 2. Scalp psoriasis and seborrheic dermatitis have different capillary bush diameters. **a** Capillary bush diameter (mean $\mu\text{m} \pm \text{SD}$) in lesional psoriasis or seborrheic dermatitis of the scalp and healthy scalp skin. * $p < 0.001$ vs. seborrheic dermatitis or healthy skin. **b** Number (mean $\pm \text{SD}$) of capillary loops per mm^2 is similar in psoriasis, seborrheic dermatitis and healthy skin.

whether erythematous scaly plaques on the scalp are psoriasis or seborrheic dermatitis may change the interpretation of the rheumatic symptoms. An important difference between psoriasis and seborrheic dermatitis are the microvasculature changes, which are constantly present in psoriasis but detected only in a minority of seborrheic dermatitis lesions [7]. In this study, we evaluated capillary morphology, distribution and density in psoriasis and seborrheic dermatitis of the scalp by VCP for differential diagnosis. VCP demonstrated that psoriasis exhibits its homogeneously tortuous and dilated capillaries, confirming previous findings [4, 5]. We also found that the diameter of the capillary bush of the scalp affected by psoriasis is much greater than in the scalp affected by

seborrheic dermatitis or normal scalp skin of healthy subjects. In contrast, capillary loop density was similar in patients with psoriasis, seborrheic dermatitis, and healthy scalp skin. The VCP changes are limited to lesional skin and were not observed in the nailfold region, as previ-

ously documented [17]. In conclusion, analysis of the vascular pattern of lesional skin could be helpful in diagnosis of psoriasis of the scalp and to differentiate it from seborrheic dermatitis.

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