Dermatology Practical & Conceptual

A Practical Algorithm for the Management of Superficial Folliculitis of the Scalp: 10 Years of Clinical and Dermoscopy Experience

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Key words: folliculitis, scalp, dermoscopy, rosacea, seborrheic dermatitis

Citation: Starace M, Yamagata JP, Cortez de Almeida RF, et al. A Practical Algorithm for the Management of Superficial Folliculitis of the Scalp: 10 Years of Clinical and Dermoscopy Experience . *Dermatol Pract Concept*. 2023;13(3):e2023131.
DOI: https://doi.org/10.5826/dpc.1303a131

Accepted: January 17, 2023; **Published:** July 2023

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Funding: None.

Competing interests: None.

Authorship: All authors have contributed significantly to this publication.

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ABSTRACT

Introduction: Superficial folliculitis of the scalp (SFS) is a common complaint in clinical practice, and initial presentation may be difficult to differentiate as they may appear very similar to each other.

Objectives: The aim of this thesis is to describe the pathologies that occur clinically as folliculitis of the scalp, identify their causes and characteristics and create a standardized classification.

Methods: This is a retrospective clinical, dermoscopic and histopathological study over 10 years of dermatologic consultations. Only individuals with a confirmed diagnosis of SFS (updated diagnostic criteria or biopsy) were included.

Results: In this review, we describe the various clinical features of different causes of SFS in ninety-nine cases and divided into infectious due to fungus, bacteria, or virus and inflammatory conditions such as rosacea, acneiform eruption and Ofuji syndrome.

Conclusions: The clinician must differentiate SFS from other underlying scarring disorders to prevent poorer outcomes. We created an algorithm to help the clinician reach a proper diagnosis.

Introduction

Folliculitis means the presence of inflammatory cells in the wall and lumen of a hair follicle. Superficial folliculitis of the scalp (SFS) is a frequent disorder and describes inflammatory infiltrate in the upper portion [1].

SFS is characterized by erythema, pustules and/or vesicles - typical of the acute phase, with possible chronic evolution into perifollicular hyperkeratosis and keratin plugs. The course is chronic-recurrent, interspersed with acute phases - sometimes difficult to manage [1].

Despite several types of SFS reported in the literature, there is no official classification yet. Usually, the one by Herman et al, a modification of Ackerman one, is the most widely known and identifies 2 major groups: superficial folliculitis (infectious and noninfectious forms) and perifolliculitis [1,2]. A classification based on the histopathological characterization of the inflammatory process (neutrophilic, lymphocytic, eosinophilic, or mixed) is also possible, which is reasonable to identify the etiological agent and the best corresponding therapeutic option [2].

Objectives

With this paper, we aimed to report 10 years of out-patients experience with SFS, showing the most common clinical pictures and dermoscopy patterns. Besides, according to their age, we created a practical algorithm for managing SFS.

Methods

We performed a retrospective medical record review of patients with a confirmed diagnosis of SFS over 10 years of dermatologic consultations. Chart review and evaluation of clinical, dermoscopic and histopathological images from the dermatology electronic medical records were conducted, and only those individuals with a confirmed diagnosis of SFS (updated diagnostic criteria or biopsy) were included. The cases were divided into infectious due to fungus, bacteria, or virus and inflammatory conditions such as rosacea, acneiform eruption and Ofuji syndrome.

Results

Between 2010 and 2020, 58 males and 41 females, aged between 1 and 80 years (mean 35 years), were referred to our attention due to SFS (Table 1). According to our findings, we divided SFS into 9 groups as following.

Dermatophytes

Tinea Capitis was diagnosed in 28 patients, 17 Caucasian and 11 Afro-descendant ones, respectively. A fungal search (microscopic and culture) was performed in all cases to confirm the clinical diagnosis and allow an etiological differentiation, important to set the most appropriate treatment. In 16 Caucasian patients, the etiologic agent was Microsporum canis, while in the others, the culprit came from the Trichophyton family (violaceum, soudanense, tonsurans).

Dermoscopy was fundamental to support the clinical suspicion (Figure 1A), enlightening the presence of typical hair shaft abnormalities. However, three patients still needed a confirmatory biopsy due to an atypical clinical presentation with diffuse alopecia and crusts on an erythematous base.

Candida

Folliculitis due to Candida albicans was diagnosed in an 84-year-old Caucasian male with an itchy scalp.

Table 1. Numbers of superficial folliculitis of the scalp cases observed in 10 years (2010 – 2020) of dermatologic consultations.

DIAGNOSIS	CASES	MALES	FEMALES	AVERAGE AGE	BIOPSY	INFLAMMATORY INFILTRATE
Infective						
Dermatophytes	28	13	15	16	3	mixed
Candida spp.	1	1	-	84	1	mixed
Malassezia spp.	13	8	5	40	2	mixed
Bacteria	21	11	10	10	1	neutrophilic
Herpes Zoster Virus	3	-	3	75	-	neutrophilic
Pox Virus	4	4	-	5	4	neutrophilic
Non-infective						
Acneiform rash	23	17	6	35	5	mixed
Rosacea	5	3	2	57	5	mixed
Ofuji syndrome	1	1	-	1	1	eosinophilic
TOTAL	99	58	41	35	22	

Multiple whitish pinpoint folliculitis could be seen on an erythematous-squamous background. However, the clinical and dermoscopic aspects were atypical, and only histological examination confirmed the diagnosis.

Malassezia

At dermoscopy, the typical arborized vessels were always present, as well as scales. Around the pustules were also evident dotted vessels (Figure 1B). Dermoscopy facilitated the diagnosis in 11 cases, while 2 needed histopathological examination.

Bacteria

Primary impetigo of the scalp is relatively rare, whereas it is much more common to see secondary forms where bacteria colonize the scalp after scratching due to itch.

The most frequently isolated bacteria in our group were Staphylococcus aureus and Streptococcus pyogenes. All cases were primary form. Physical examination, facilitated by dermoscopy, always allowed the diagnosis except for 1 patient.

At dermoscopy, single exudative to crusted yellowish -colored lesions, sometimes trapping tufts of hair, and surrounded by erythema with sparsely dotted vessels, were clearly visible.

Herpes Zoster Virus

All patients reported during the vesicular phase evolved into a crusty phase subsequently. The associated neuritis helped define the diagnosis. A confirmatory PCR was, however, made in all patients.

Pox Virus

Molluscum contagiosum was diagnosed in 4 children. Two presented whitish papules of a few mm in diameter visible to the naked eyes but better defined at dermoscopy [5]. Despite the evident presence of molluscum body after curettage, pathology was required to make the differential diagnosis with scalp nodules.

Acneiform Eruption

Pustules and follicular crusts are generally observed on an erythematous base, sometimes accompanied by pain or accidental bleeding with minimal trauma. The culture was always negative for bacteria. In milder cases, a biopsy was performed to support the differential diagnosis with seborrheic dermatitis (SD) due to dilated and arborized capillaries.

At dermoscopy, pustular lesions were clearly visible as distributed on top of the follicular ostium. The roof of the pustular lesions is very fragile, and easily ruptures with leakage of serum material (Figure 1C).

Rosacea

The presence of Demodex folliculorum (tails) was identified in five patients referred for red and itchy scalp. Skin biopsy was performed in all cases as the clinical picture and dermoscopy pattern did not provide a conclusive diagnosis despite the presence of diffuse erythema, branching vessels and small dry scales (Figure 1D). In some areas of the scalp, the most sun-exposed, we have also identified a diffuse vascular

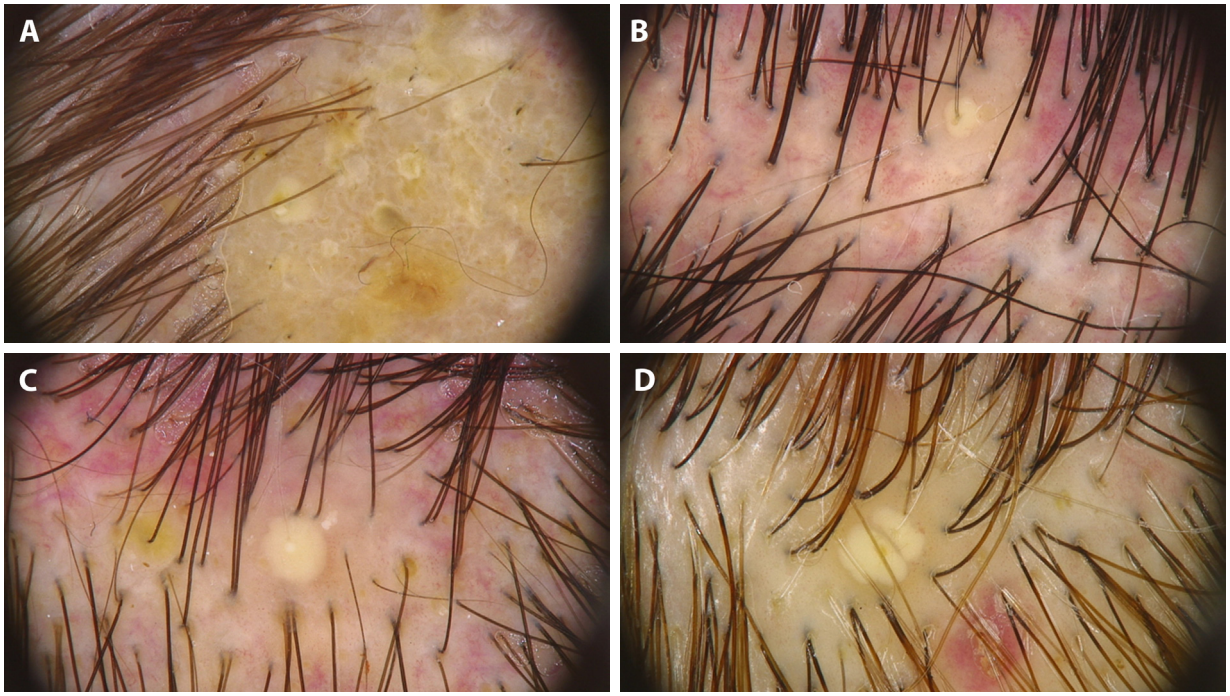

Figure 1. (A) Dermoscopic image of tinea capitis (kerion). Culture of the lesion confirmed the presence of Microsporum canis. (B) Dermoscopic image of dilated and arborizing vessels with dotted vessels around the pustule, which are typical of seborrheic dermatitis. (C) Dermoscopic image of folliculitis during the acute phase of a histologically confirmed acneiform eruption. (D) Dermoscopic image of scalp rosacea: erythematous round lesions with a central yellowish area.

alteration, characterized by round lesions, frankly erythematous and flat, painful if of recent onset, and with a central yellowish area, as reported in the literature [6,7]. The color of these spots turns brownish over time. All patients were classified as rosacea third stage due to a stable phase of vasodilation.

A variant of rosacea named glandular form, characterized by edematous papules, large pustules, nodulocystic lesions, marked inflammation and hyperseborrhea has been described in the literature but never found in our practices [8].

Eosinophilic Pustular Folliculitis (Ofuji Syndrome)

A 1-year-old child presented us with small scalp pustules that tended to confluence and form an annular or polycyclic plaque. Yellow crusts were also present, possibly due to scratching. At dermoscopy, pustules and the erythematous base were more evident, as well as crusts and dilated vessels. Biopsy was, however, mandatory, and the pathology report confirmed eosinophilic pustular folliculitis. Cytology was also important to reveal the presence of eosinophils and to allow differential diagnosis with infective forms.

Discussion

An early diagnosis of SFS is sometimes difficult as, initially, they may appear very similar to each other. An accurate clinical history, with careful physical examination and instrumental techniques, helps determine the correct diagnosis. Also, very much important is not to miss another underlying and potentially scarring disorder.

Etiological agents such as Malassezia, Demodex, etc, are common commensals of our scalp and live in the follicular infundibulum. When in excess, they can act as trigger factors, stimulating a perifollicular inflammatory reaction comprised of lymphocytes, neutrophils, and, occasionally, multinucleated histiocytes [10]. They can be treated but not removed.

Malassezia is implicated in the pathogenesis of SD. In the presence of significant refractory inflammation, folliculitis appears. Because of the intense itch, scratching the pustules can frequently lead to bacterial superinfection and yellow crusts [4].

Folliculitis in Tinea Capitis is generally present in acute stages and presents as a follicular micro papule that progresses centrifugally to form a round or polycyclic plaque 5-6 cm in diameter with hair shafts trapped inside [3].

Ofuji syndrome is characterized by four clinical signs and symptoms: 1. sterile pustules in seborrheic areas, 2. intermittent outbreaks accompanied by leukocytosis and eosinophilia, 3. primary follicular eosinophilic pustules, 4. good response to small and prolonged doses of corticosteroids. Post-inflammatory hyperpigmentation might follow as a sequela [9].

From the data that emerged in this study, we created an algorithm (Figure 2) based on the clinical and dermoscopic picture, to help reach the correct diagnosis. Table 2 summarizes the main clinical, dermoscopic and histopathological

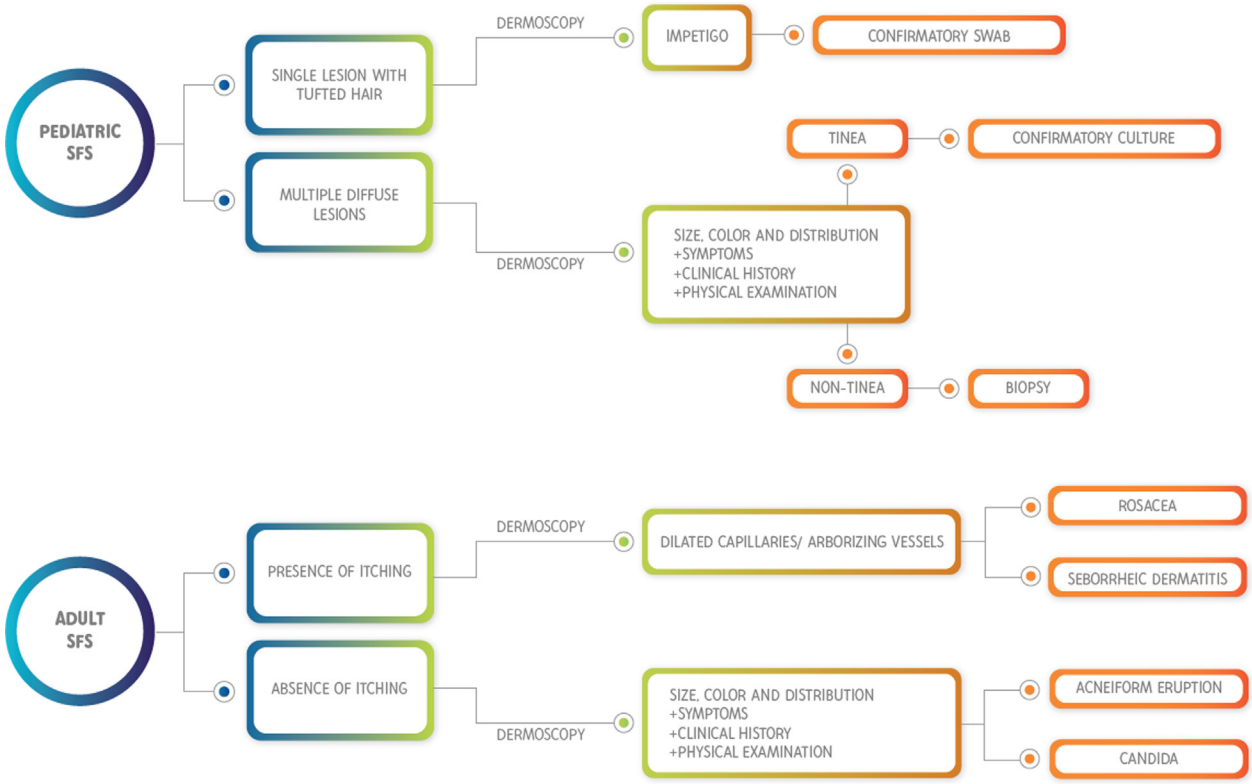

Figure 2. Suggested algorithm to follow when dealing with superficial folliculitis of the scalp
SFS = superficial folliculitis of the scalp.

Table 2. Clinical, dermoscopic and histopathological features of SFS.

	Clinical Features	Dermoscopy	Histopathology
Dermatophytes	Follicular micropapule.	Comma, broken and corkscrew hair, black dots and pustules with or without trapped hair.	Superficial and deep mixed perifollicular infiltrate. Positive PAS staining.
Candida	From small pustules to painful papules, nodules and pustules with the presence of itching.	Multiple whitish pinpoint pustules, scattered throughout the scalp. Peripheral erythematous halo with small dilated capillaries.	Dense perifollicular mixed-type infiltrate, edema, abscesses at the follicular epithelium and PAS-positive staining.
Malassezia	Folliculitis with small whitish scales on the scalp, erythematous-desquamative plaques with greasy appearance and seborrhea with greasy and opaque hair.	Furfuraceous scales, arborized vascular and atypical reticular dilatations, small whitish folliculitis, centered by the hair and a small crust secondary to itching.	Mild to moderate lymphocytic inflammatory infiltrate at the infundibular, peri-infundibular and peri-isthmic level, mild fibroplasia, abscesses, dilation of the infundibulum with laminated orthokeratosis and focal parakeratosis of the epidermis.
Bacteria	A single lesion with a tuft of hair. Yellowish-whitish pustule with perifollicular erythema, yellow-brownish crusts, painful perifollicular papular lesions with peripheral erythema.	A crusty thickened exudative lesion, yellowish in color, with a central tuft and peripheral erythema; brownish yellow background with an aflegmasic alopecia, atrophy, and absence of follicular openings.	Collection of neutrophils and bacteria in the epidermis with dilated vessels, edema, and mild-moderate mixed type -infiltrate in the papillary and middle dermis.
Herpes Zoster	Multiple vesicles and subsequent pustules following the innervation, with neuritis of the scalp.	Herpetic polymorphism: vesicles, pustules and crusts at the same time and peripheral erythema with numerous dilated and superficial capillaries, scabs and scarring lesions.	Intraepidermal vesicles containing multinucleated keratinocytes with a nucleus of grayish color, marginal chromatin, ballooning cytoplasm and acantholysis. A moderate-dense perivascular and interstitial inflammatory infiltrate of mixed-type fibrosis and destruction of the adnexal structures.
Pox virus	Hemispherical and roundish papules, in pale-pink color, 2-3 mm in diameter, with a central navel and a smooth regular surface.	Central umbilicated papule surrounded by yellowish-white polylobed amorphous structures. Crown vessels known as "red corona" emerge from the periphery of the lesion and radiate towards the center, rarely crossing each other.	Rounded basophilic bodies present among the keratinocytes are observed, grouped in a "crater" and in the infundibular hyperplastic areas of the granular and spinous layer of the epidermis.
Acneiform Eruption	Papules, pustules or follicular crusts on erythematous skin, pain with possible bleeding or leakage of pus.	Central pustular lesions, intensely erythematous with dilated capillaries in the periphery, crusts of variable colors from intense red to yellowish-brown, dilated vessels with a lattice appearance throughout the scalp.	Suppurative folliculitis in the superficial dermis with a neutrophilic inflammatory infiltrate, dilated sebaceous glands and hyperkeratinization of the intrainfundibular epithelium and retention of lamellae, plugs.
Rosacea	Diffuse erythema of the scalp with small dry scales, painful flat erythematous round lesions, and facial involvement.	Branching vessels with a yellowish central area that turns brownish over time.	Vasodilation of the vessels of the subpapillary plexus and a polymorphic inflammatory infiltrate, non-caseous granulomatous infiltrate in the perifollicular and perivascular areas, and the presence of *Demodex Folliculorum*.
Ofuji syndrome	Plaque of small erythematous-edematous, sterile pustules in seborrheic areas.	Central folliculitis with dilated capillaries in the periphery and yellowish crust.	Massive mixed-type inflammatory infiltrates, microabscesses, epithelial necrosis and intercellular edema.

features of SFS. When dealing with a pediatric patient with SFS, the first step is to classify the presence of a single lesion with tufted hair or multiple diffuse lesions. In single lesions, if dermoscopy shows a crusty/exudative yellowish area with a central tuft, the diagnosis of scalp impetigo is the most probable.

In cases with multiple diffuse lesions on the scalp, when dermoscopy presents with typical hair shaft abnormalities such as comma, broken or corkscrew hairs and pustules with or without trapped hairs, tinea capitis should be suspected, and a confirmatory culture requested. When dermoscopy is not typical for tinea capitis, a biopsy is recommended.

In adult patients with SFS, the main point is to assess the presence of itching. When there is pruritus, associated with dilated arborizing vessels, the diagnosis of rosacea (when there is concomitant facial involvement) or SD should be considered. In cases without pruritus, a thorough clinical history and dermoscopy help differentiating the diagnosis of acneiform eruption or candida.

In conclusion, this article suggests an algorithm containing these main differential diagnoses to guide dermatologists in clinical practice. From our algorithm, in a pediatric patient, folliculitis generally occurs with impetigo or tinea capitis. In adults, the main reason for SFS is probably SD. Symptoms such as pain or discomfort may suggest an acneiform rash – if non-itchy – or scalp rosacea – if itching, and in both conditions facial involvement is present.

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