

# Differentiation of pigmented Spitz nevi and Reed nevi by integration of dermatopathologic and dermatoscopic findings

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## ABSTRACT

**Background:** It is unclear whether pigmented Spitz and Reed nevi are distinct morphologic entities or part of the spectrum of Spitz nevi.

**Methods:** In a retrospective observational study we analyzed dermatopathologic slides of 22 cases with clinical and dermatoscopic features indicative of pigmented Spitz or Reed nevus in a blinded fashion according to predefined criteria and subsequently correlated dermatopathologic with clinical and dermatoscopic findings.

**Results:** We differentiated pigmented Spitz and Reed nevus dermatopathologically by their capacity of melanin production and a vertical versus horizontal growth pattern. Based on histopathology 20 nevi (91%) could be reliably diagnosed as Reed nevus (68%, n=15) or as pigmented Spitz nevus (23%, n=5). In two cases (9%, n=2) it was not possible to make a clear distinction from a dermatopathologic point of view. Dermatopathologic-dermatoscopic correlation showed that Reed nevi were characterized by a dermatoscopic pattern of peripheral radial lines or pseudopods (fascicular growth pattern), whereas pigmented Spitz nevi were typified by a pattern consisting of clods (nested growth pattern). “Spitz cells” (large epithelioid melanocytes) were more commonly found in Spitz nevi (100%, n = 5) but were also present in Reed nevi (n=6, 40%). Spindle cells were found in both types of nevi.

**Conclusions:** Pigmented Spitz and Reed nevi can be reliably distinguished based on their dermatopathologic and dermatoscopic patterns. The specific dermatopathologic patterns of pigmented Spitz and Reed nevi correspond well to their dermatoscopic patterns. The presence of “Spitz cells” or spindle cells should not be regarded as the decisive criterion to differentiate between these two entities.

## Introduction

Spitz nevus has been a matter of controversy in dermatology since its description in 1948 [1]. Although the defining criteria have been considerably refined over the years, there is still no consensus, even among expert dermatopathologists [2,3]. Several clinical and dermatopathologic variants have been described probably nourishing that disagreement [4]. Since its description in 1975, Reed nevus has traditionally been regarded as a particular, and probably the most common, variant within the spectrum of Spitz nevi, although from the outset, Reed distinguished between pigmented spindle cell nevus and Spitz nevus because the former possessed plentiful melanin and lacked the infiltrative growth pattern frequently found in Spitz nevi [4–7]. According to Ackerman, with the exception of Reed nevus, the many morphologic expressions of Spitz nevus are united by a common cytopathologic denominator, i.e., epithelioid melanocytes with largish nuclei, abundant cytoplasm and oval, spindle, round or polygonal shapes (“Spitz cells”) [6]. However, some authors believe that a dermatopathologic distinction between pigmented Spitz and Reed nevus is difficult, not reproducible and maybe clinically useless, hence, accept a subsuming classification of some of these nevi under an all-inclusive category named “pigmented-Spitz-Reed-nevus” [8].

Existing confusion concerning the distinctive criteria may, at least in part, result from misunderstandings between clinicians or dermatoscopists and dermatopathologists, respectively. A relevant source of confusion might originate from the tendency of non-critical acceptance of pathologic reports by clinicians, leading to unwarranted conclusions and divergent data between different work groups.

For example, Pizzichetta et al reported on morphologic changes of a “spitzoid” melanocytic nevus [9]. Both the dermatoscopic and the described dermatopathologic findings seem to be pathognomonic of a Reed nevus, however, as the signing pathologist diagnosed a Spitz nevus (surprisingly, “because of the presence of nests of heavily pigmented, spindle-shaped melanocytes at the dermo-epidermal junction”), the authors concluded that Spitz nevi might exhibit two principal dermatoscopic patterns, a “starburst” and a “globular” pattern. Hence, the impressive changes during the developmental course of a stereotypical Reed nevus were erroneously also related to pigmented Spitz nevus.

Another interesting case was presented by Marchell et al, who illustrated the “starburst pattern” as a dermatoscopic clue to Spitz and Reed nevi. Although obviously distinguishing both nevus types, they did not do that respectively to the provided figures. Figures 1, 2 and 4 of their article show the stereotypical appearance of Reed nevi, i.e., a “starburst pattern” consisting of radially arranged lines or pseudopods, but what they call “starburst pattern” in figure 3 of their

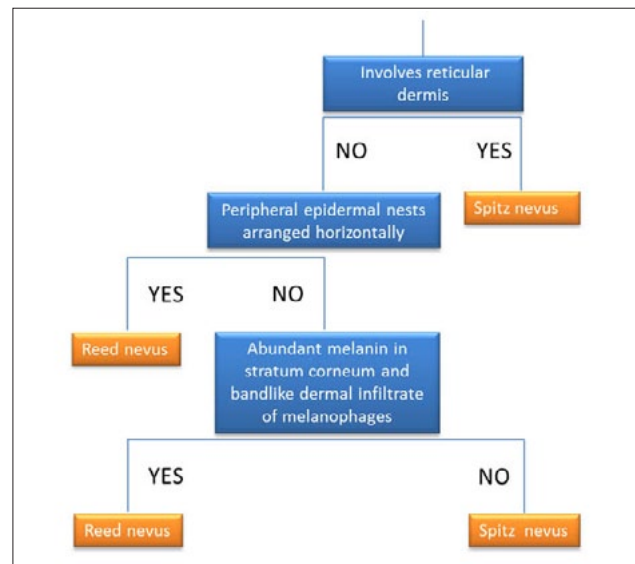


Figure 1. Simple algorithm for the dermatopathologic differentiation of Spitz and Reed nevi. [Copyright: ©2012 Bär et al.]

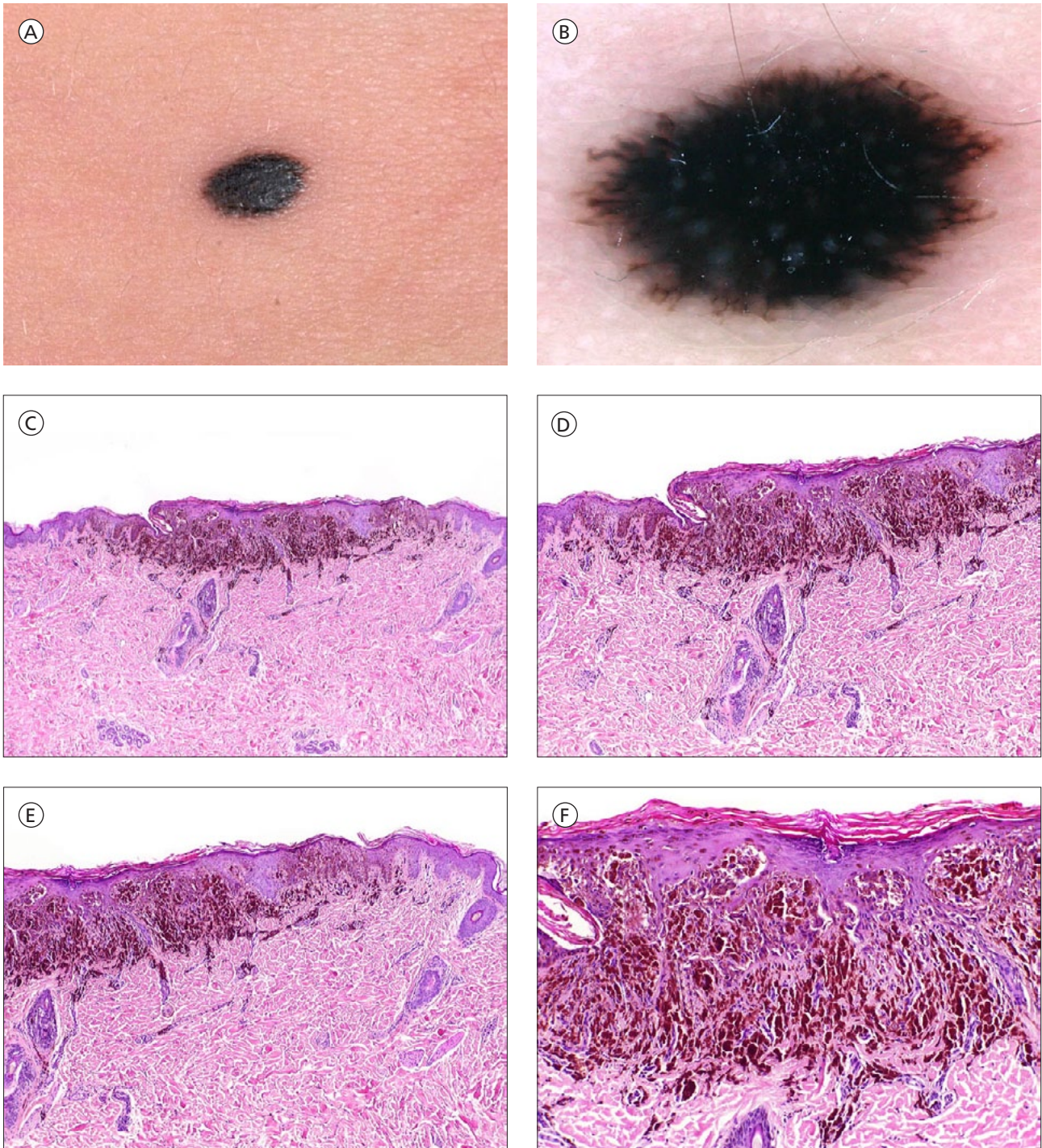
article differs clearly from the “starburst pattern” shown in the other figures because it is typified by a peripheral rim of globules or clods instead of radial lines [10].

Also Ackerman, who first set forth a unifying concept [6,11] (but in his recent monograph on Spitz nevus finally stated that Spitz nevus is different from Reed nevus), presented a dermatoscopically and dermatopathologically stereotypical case of a Reed nevus that, owing to the presence of polygonal melanocytes, was diagnosed by him as a Spitz nevus. As a consequence, the pathognomonic adjacent lichenoid infiltrate of melanophages was erroneously recognized as a denominator that may be common to both Spitz and Reed nevi (see page 115 of Ackerman AB, Elish D, Shami S. “*Spitz’s nevus*”: *Reassessment Critical, Revision Radical* [12]). However, as disclosed by other authors, epithelioid or stellate and even multinuclear melanocytes are an expected finding at least in early Reed nevus [4,13,14].

Ideally, clinical, dermatoscopic and histopathologic examination should independently result in a single diagnosis. The aforementioned examples point to the need for a consistent morphologic classification of melanocytic nevi integrating dermatopathologic, dermatoscopic and clinical findings. A clear morphologic distinction of melanocytic nevi is an indispensable prerequisite before classification on a molecular level. There is a lot of molecular data available concerning Spitz nevus but, to our knowledge, no corresponding data exists explicitly referring to Reed nevus. This may be due to inclusion of Reed nevi into the group of Spitz nevi, which again might explain different findings of several work groups [15–19].

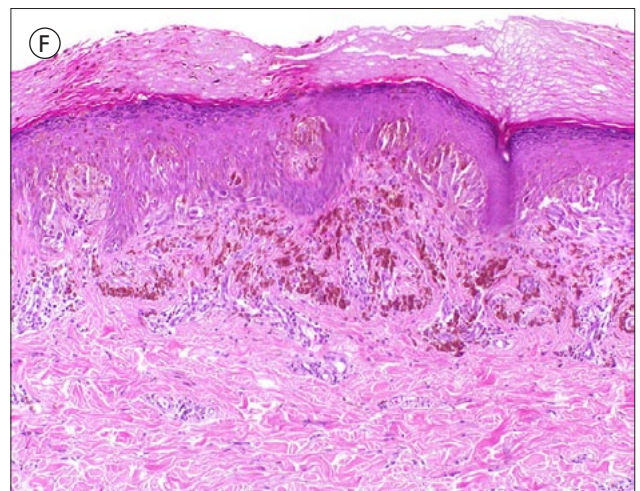
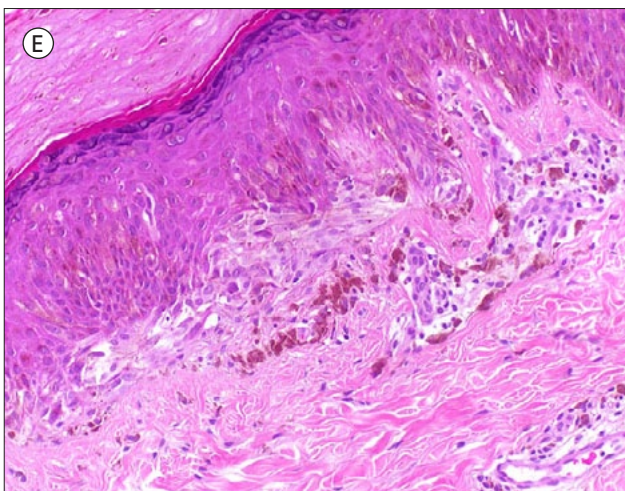
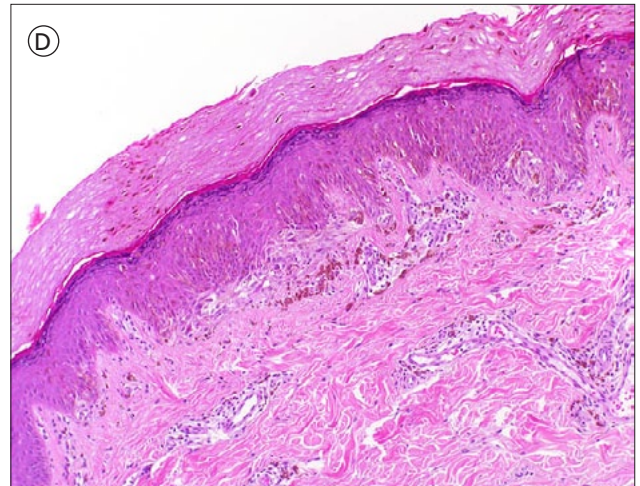
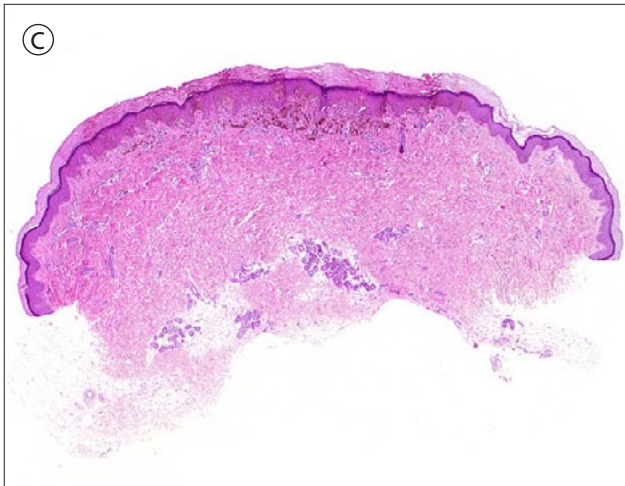
The purpose of this study was to test the reliability of predefined histomorphologic criteria to differentiate between pigmented Spitz and Reed nevi and to correlate them with clinical and dermatoscopic findings.





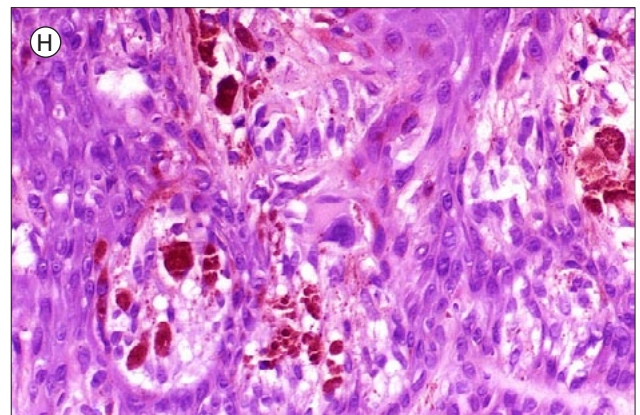
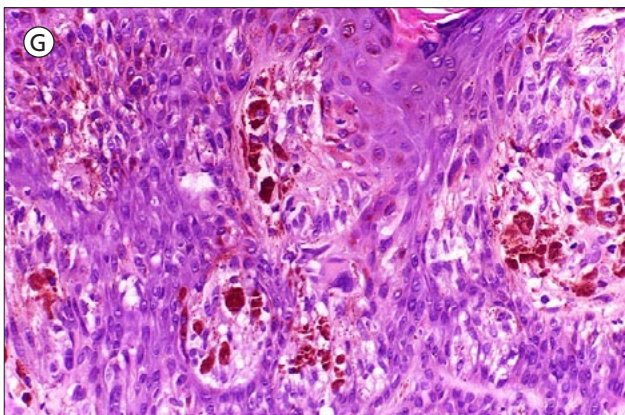
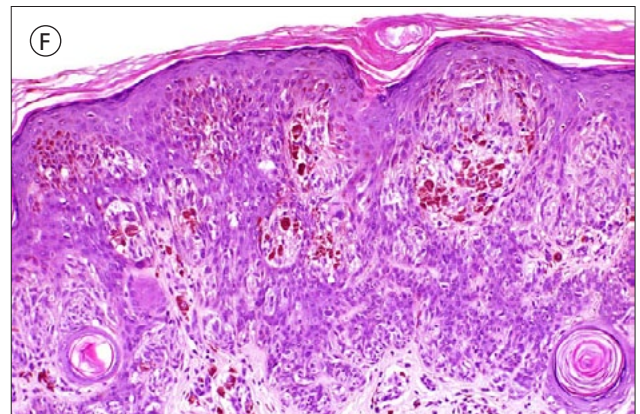
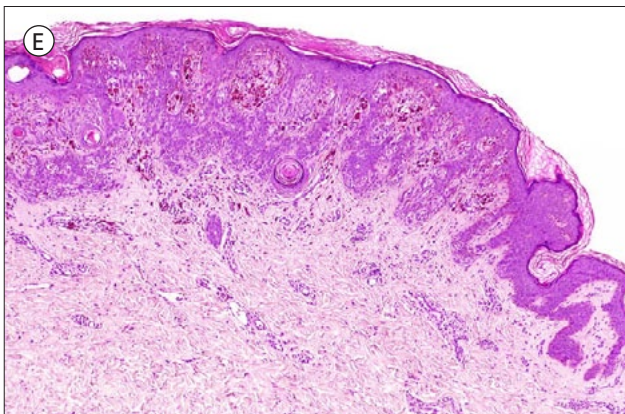
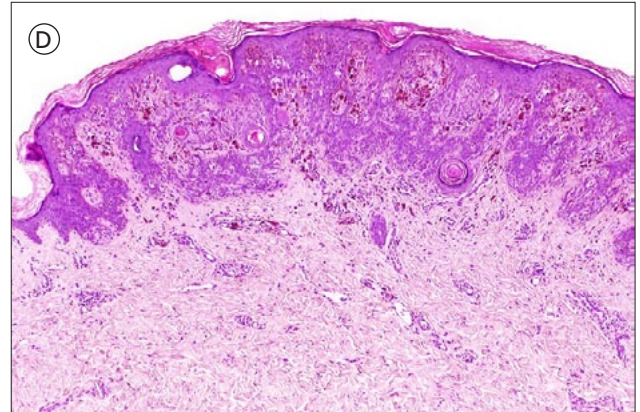
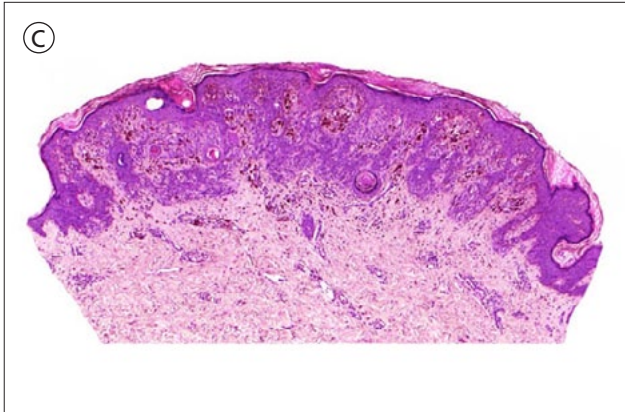
**Figure 2.** Clinical (A), dermatoscopic (B) and dermatopathologic (C–F) stereotype of a Reed nevus at the lower back of a 2-year-old boy. Dermatoscopically it is a symmetric lesion composed of radial lines (or pseudopods) at the periphery and a black structureless center. It has been classified as a Reed nevus and not as a Spitz nevus dermatopathologically because it does not involve the reticular dermis, and there is abundant melanin in the stratum corneum and a band-like infiltration by melanophages within the papillary dermis (F). [Copyright: ©2012 Bär et al.]





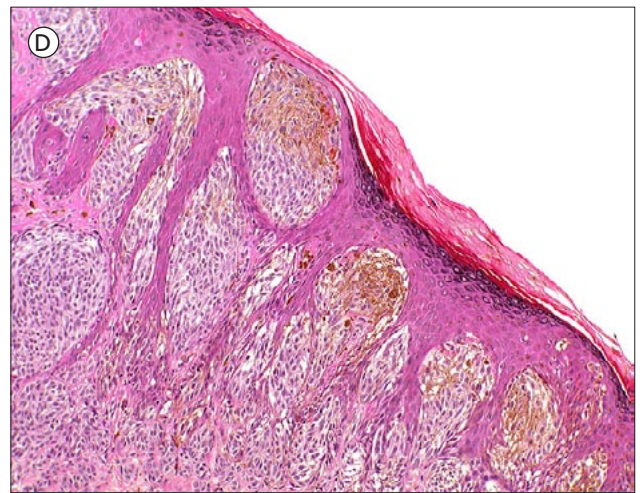
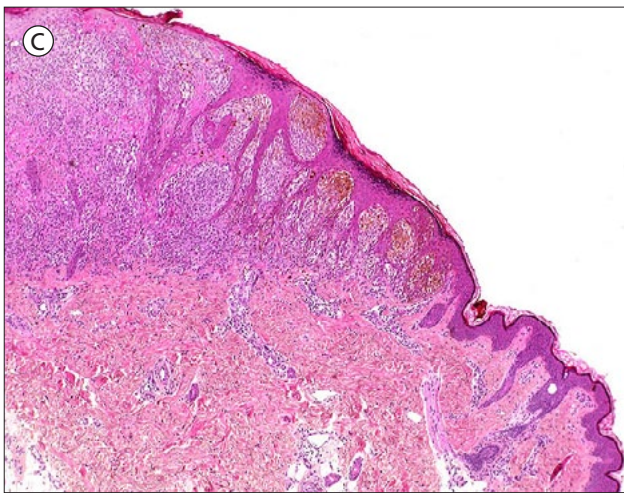
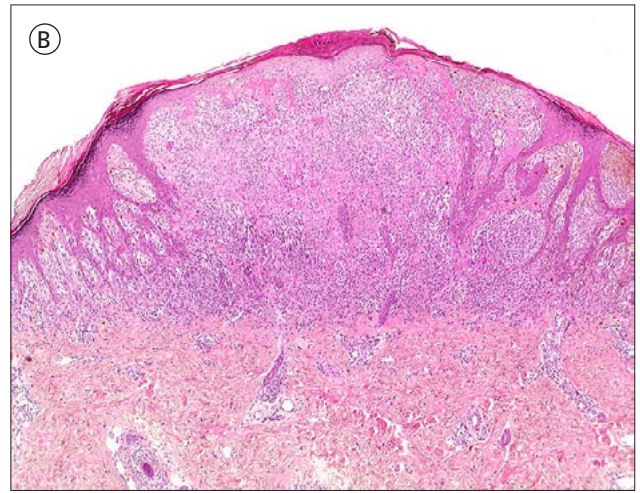
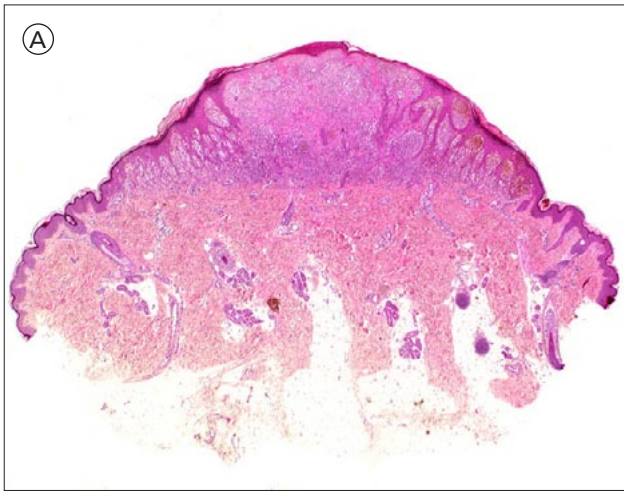
**Figure 3.** Dermatopathologically this nevus was diagnosed as Reed nevus and not as Spitz nevus because it does not involve the reticular dermis, melanocytes at the dermo-epidermal junction are arranged in horizontal nests at the periphery, and because of abundant melanin in the stratum corneum and a band-like infiltrate of melanophages in the dermis. The corresponding clinical and dermoscopic image fit very well with the dermatopathologic diagnosis. Clinically it is a flat and darkly pigmented lesion. Dermoscopically it is typified by a pattern of radial lines and pseudopods at the periphery and a black structureless center. The pseudopods correspond to the horizontal epidermal nests (fascicles) which is typical for the fascicular growth pattern. Only if the pseudopods are cut tangentially are horizontal nests visible dermatopathologically. If the pseudopods are cut at right angles, however, they appear as nests dermatopathologically. [Copyright: ©2012 Bär et al.]





**Figure 4.** Clinical (A), dermatoscopic (B), and dermatopathologic (C–G) stereotype of a pigmented Spitz nevus. Clinically it cannot be differentiated from a Reed nevus with certainty. Dermatoscopically it is typified by a pattern of clods (“globules”). Dermatopathologically it is a Spitz nevus and not a Reed nevus because epidermal melanocytes are arranged in nests and not in fascicles (C–F), there is only sparse melanin in the stratum corneum, and only a sparse infiltrate of melanophages in the dermis. The melanocytes are pleomorphic and some of them are large (G, H) with abundant cytoplasm (“Spitz cells”). [Copyright: ©2012 Bär et al.]





**Figure 5.** Dermatopathologically this nevus was diagnosed as Spitz nevus because it involves the reticular dermis (A, B). Spindle melanocytes in the epidermis are arranged in vertical nests (C, D). The corresponding clinical (E) and dermatoscopic (F) images fit very well with the dermatopathologic diagnosis of Spitz nevus. Clinically it is a nodule. Reed nevi are never nodular. Dermatoscopically it is typified by a pattern of clods and a structureless pattern. Pseudopods or radial lines are absent. [Copyright: ©2012 Bär et al.]

## Materials and methods

Cases with clinical and dermatoscopic patterns indicative of pigmented Spitz or Reed nevus were retrospectively collected from photographic databases of pigmented skin lesions of the Department of Dermatology at the Medical University of Vienna and the Department of Dermatology at the Görlich Municipal Hospital. Lesions pathologically recognized as other than Spitz or Reed nevus (e.g., Clark nevus, Ackerman nevus, Zitelli nevus, blue nevus, melanoma, seborrheic keratosis) were not considered for further analysis.

Dermatopathologically analyzed criteria were symmetry, demarcation, overall shape, hyperkeratosis, hypergranulosis, acanthosis, melanocytes aggregated in nests, shape and orientation of nests, clefts between melanocytes and adjacent keratocytes, solitary melanocytes, morphology of melanocytes, localization of melanocytes, infundibular hyperplasia, infiltration of eccrine ducts, pigmentation of the lower epidermis, pigmentation of melanocytes, intracorneal melanin deposition, melanophages, Kamino bodies, perivascular lymphocytes, and fibroplasia. All criteria were graded in consensus between two of the authors (M.B., H.K.). Evaluation of pathologic slides was performed in a blinded manner (i.e., the corresponding clinical and dermatoscopic images were not revealed). A stepwise classification rule was implicitly applied to differentiate between pigmented Spitz and Reed nevus (Figure 1). In a first step, the localization of the melanocytes is taken into account. If the lesion involves the reticular dermis, it is a Spitz nevus. If the melanocytes are housed only in the epidermis and in the papillary dermis, the nevus is classified as Reed nevus if either a considerable number of epidermal nests are arranged horizontally to the skin surface (especially at the periphery of the nevus) or if there is abundant melanin in the stratum corneum and a prominent band-like infiltrate of melanophages in the papillary dermis. If none of the two criteria is present, the lesion is classified as Spitz nevus.

According to this algorithm two “spitzoid” melanocytic nevi were dermatopathologically not readily classifiable as pigmented Spitz or Reed nevus. After dermatopathologic grading, the dermatoscopic pattern was analyzed based on the corresponding dermatoscopic photographs, according to the method advocated by Kittler [20]. We differentiated between two main dermatoscopic patterns: (1) a pattern of clods (globules) and (2) a pattern of symmetric radial lines or pseudopods.

### Statistical analysis

Comparisons of proportions were performed with the Fisher exact test or its corresponding Freeman-Halton extension. P-values < 0.05 indicate a statistically significant difference. All given P-values are 2-tailed.

## Results

### General data

Of 22 patients, seven were male and 15 female. The median age at removal was 15 years. Most nevi were located at the lower (n = 8) or upper extremities (n = 5). Based on predefined dermatopathologic criteria, five nevi (23%) were classified as pigmented Spitz nevus and 15 (68%) as Reed nevus. Two nevi could not be classified with certainty. Clinically, two Spitz nevi (40%) were significantly elevated compared to only one Reed nevus (7%,  $P = 0.13$ ).

### Dermatopathologic findings

The main dermatopathologic characteristics of pigmented Spitz and Reed nevi are given in Table 1. Both types of nevi were symmetric and well circumscribed and epidermal melanocytes tended to be arranged in large nests. Infundibular hyperplasia, hyperkeratosis, pagetoid spread of single melanocytes, cleft formation between melanocytes and adjacent keratocytes and perivascular lymphocytes were frequent findings in both types of lesions. Hypergranulosis, acanthosis and epithelioid and polymorphous melanocytes were more often observed in pigmented Spitz nevus than in Reed nevus. Infiltration of eccrine glands was more frequent in Reed nevus than in Spitz nevus but the difference was statistically not significant. Epithelioid melanocytes were found in all pigmented Spitz nevi and in 40% of Reed nevi. Spindle cells predominated in 20% of Spitz nevi and in 67% of Reed nevi. Kamino bodies and fibroplasia were more common in pigmented Spitz nevi.

### Dermatoscopic findings

The dermatoscopic patterns of pigmented Spitz and Reed nevi are shown in Table 2. Both types of nevi are typified by symmetry and a structureless center. However, statistical analysis of the dermatoscopic features revealed that centrally localized clods (globules) and a brown structureless center are more common in pigmented Spitz nevus than in Reed nevus. Circumferential clods were only found in pigmented Spitz nevi but not in Reed nevi. In contrast, a black structureless center and circumferential radial lines or pseudopods are common in Reed nevi but absent in Spitz nevi.

## Discussion

Most classifications of diseases are based on consensus. Diseases can be classified in more than one way depending of the point of view of the observer. Because views of clinicians differ from those of dermatopathologists, multiple conflict-

Table 1. Frequencies of dermatopathologic criteria in pigmented Spitz and Reed nevi with corresponding p-values. [Copyright: ©2012 Bär et al.]

Criterion	Specification	Pigmented Spitz nevus (n = 5)	Reed nevus (n = 15)	P-value*
Symmetry	present	5 (100%)	15 (100%)	0.99
Demarcation	well defined	4 (80%)	10 (67%)	0.99
Shape	dome-shaped	1 (20%)	0 (0%)	0.25
	flat	4 (80%)	15 (100%)	
Hyperkeratosis	absent or little	3 (60%)	10 (67%)	0.99
	moderate or strong	2 (40%)	5 (33%)	
Hypergranulosis	absent or little	1 (20%)	12 (80%)	0.03
	moderate or strong	4 (80%)	3 (20%)	
Acanthosis	absent or little	1 (20%)	13 (87%)	0.01
	moderate or strong	4 (80%)	2 (13%)	
Infundibular hyperplasia	present	2 (40%)	4 (27%)	0.61
Infiltration of eccrine ducts	present	0 (0%)	5 (33%)	0.27
Melanocytes aggregated in (largish) nests	absent or little	0 (0%)	2 (13%)	0.99
	moderate or strong	5 (100%)	13 (87%)	
Predominant shape of nests	round	2 (40%)	7 (47%)	
	oval, vertical	3 (60%)	5 (33%)	
	oval, horizontal	0 (0%)	3 (20%)	
Solitary melanocytes	absent or little	5 (100%)	12 (80%)	0.56
	moderate or strong	0 (0%)	3 (20%)	
Cleft formation	absent or little	3 (60%)	10 (67%)	0.99
	moderate or strong	2 (40%)	5 (33%)	
Morphology of melanocytes	monomorphous	1 (20%)	14 (93%)	0.01
	polymorphous	4 (80%)	1 (7%)	
Shape of melanocytes	spindle-shaped			0.13
	absent or little	4 (80%)	5 (33%)	
	moderate or strong	1 (20%)	10 (67%)	
	epithelioid			0.04
	absent or little	0 (0%)	9 (60%)	
	moderate or strong	5 (100%)	6 (40%)	
	multinuclear			0.45
	absent or little	4 (80%)	14 (93%)	
	moderate or strong	1 (20%)	1 (7%)	
Pagetoid spread	absent or little	4 (80%)	12 (80%)	0.99
	moderate or strong	1 (20%)	3 (20%)	
Localization of melanocytes	junctional only (superficial)	0 (0%)	14 (93%)	
	compound (superficial)	3 (60%)	1 (7%)	
	compound (superficial & deep)	2 (40%)	0 (0%)	
Hyperpigmentation of lower epidermis	absent or little	5 (100%)	6 (40%)	0.04
	moderate or strong	0 (0%)	9 (60%)	
Melanin within melanocytes	absent or little	3 (60%)	2 (13%)	0.07
	moderate or strong	2 (40%)	13 (87%)	
Intracorneal melanin	absent or little	5 (100%)	2 (13%)	
	moderate or strong	0 (0%)	13 (87%)	
Melanophages	absent or little	5 (100%)	1 (7%)	
	moderate or strong	0 (0%)	14 (93%)	
	band-like	0 (0%)	14 (93%)	
Kamino bodies	present	1 (20%)	0 (0%)	0.06
Perivascular lymphocytes	absent or little	3 (60%)	10 (67%)	0.99
	moderate or strong	2 (40%)	5 (33%)	
Fibroplasia	absent or little	3 (60%)	15 (100%)	0.05
	moderate or strong	2 (40%)	0 (0%)	

\*P-values are only given for variables that were not used as decisive criterion to differentiate between pigmented Spitz and Reed nevi in advance



Table 2. Frequencies of dermatoscopic features according to dermatopathologic diagnosis. [Copyright: ©2012 Bär et al.]

Localization	Criterion	Pigmented Spitz nevus (n = 5)	Reed nevus (n = 15)	P-value
General	symmetry	4 (80%)	15 (100%)	0.25
Center	clods present	4 (80%)	2 (13%)	0.01
	structureless brown	4 (80%)	3 (20%)	0.03
	structureless black	0 (0%)	12 (80%)	0.004
Periphery	clods	1 (20%)	0 (0%)	0.06
	radial lines / pseudopods	0 (0%)	10 (67%)	0.03

Table 3. Differentiation of pigmented Spitz and Reed nevi according to dermatopathologic, dermatoscopic and clinical criteria. [Copyright: ©2012 Bär et al.]

(Pigmented) Spitz nevus	Reed nevus
<b>Clinical:</b> <ul style="list-style-type: none"> <li>• Often raised (even nodular), rarely flat</li> <li>• Color brown</li> </ul>	<b>Clinical:</b> <ul style="list-style-type: none"> <li>• Flat or slightly raised (never nodular)</li> <li>• Color dark brown or black</li> </ul>
<b>Dermatoscopy:</b> <ul style="list-style-type: none"> <li>• Only clods or clods at the periphery and structureless brown in the center, sometimes white or gray lines in the structureless center</li> </ul>	<b>Dermatoscopy:</b> <ul style="list-style-type: none"> <li>• Clods in the beginning, then radial lines or pseudopods at the periphery and structureless black (or dark brown) in the center</li> </ul>
<b>Growth pattern:</b> <ul style="list-style-type: none"> <li>• Nested, vertical growth pattern</li> </ul>	<b>Growth pattern:</b> <ul style="list-style-type: none"> <li>• Fascicular, horizontal growth pattern</li> </ul>
<b>Dermatopathology:</b> <ul style="list-style-type: none"> <li>• Acanthosis and hypergranulosis often striking</li> <li>• Intracorneal melanin delicate or absent</li> <li>• Epidermal nests are round or oval in vertical arrangement</li> <li>• May involve reticular dermis</li> <li>• Epithelioid melanocytes often</li> <li>• Kamino bodies may be present</li> <li>• Fibroplasia or sclerosis may be present</li> <li>• Melanocytes usually polymorphic</li> </ul>	<b>Dermatopathology:</b> <ul style="list-style-type: none"> <li>• Acanthosis and hypergranulosis usually mild or absent</li> <li>• Intracorneal melanin striking</li> <li>• Epidermal nests arranged horizontally sometimes</li> <li>• Never involves the reticular dermis</li> <li>• Epithelioid melanocytes sometimes</li> <li>• Kamino bodies usually absent</li> <li>• Band-like infiltration by melanophages in the superficial dermis, no fibrosis or sclerosis</li> <li>• Melanocytes usually monomorphic but polymorphic melanocytes may occur</li> </ul>

ing classifications may emerge, leading to confusion, the variety of classifications of nevi being a good example. Some classifications of nevi are based mainly on dermatopathologic findings and others on clinical findings, and future classifications will probably be based on molecular findings. If there is no “true” classification, the question is which criteria should be used to assess the validity of a classification. From a pragmatic point of view it can be asserted that any classification that works in practice is useful. The purpose of this study was to propose criteria for the differentiation of Reed and pigmented Spitz nevi that work in practice for clinicians,

dermatoscopists and dermatopathologists. Our motivation for the study was the ongoing controversy of whether Reed and pigmented Spitz nevi are expressions of the same type of nevus or two different entities. We regard the lack of balance between clinical, dermatoscopic and dermatopathologic views as a major reason for this controversy. We started from a dermatopathologic point of view (i.e., we defined dermatopathologic criteria for Spitz and Reed nevi first and then correlated them with clinical and dermatoscopic findings) because the final diagnosis of melanocytic proliferations is still made by dermatopathologists and not by clinicians, and

both types of nevi were initially defined by pathologists.

In historical perspective it has been proposed that, in contrast to Reed nevi, Spitz nevi are mainly typified by cytomorphologic criteria, i.e., by the presence of melanocytes with largish nuclei, abundant cytoplasm and oval, spindle, round or polygonal shapes (“Spitz cells”) [6]. On the other hand, Ackerman stated that a nevus exclusively composed of spindle cells is incompatible with the diagnosis of Spitz nevus [6,12]. He finally acknowledged in his recent monograph on Spitz nevus that pigmented Spitz nevus is different from Reed nevus [12]. However, to date, many textbooks or atlases of dermatology or histopathology assert that Reed nevus is a variant of Spitz nevus [4,6,21–25]. According to Argenziano et al, a dermatopathologic distinction between pigmented Spitz and Reed nevus is difficult, not reproducible and maybe clinically useless. They proposed an all-inclusive category named “pigmented-Spitz-Reed-nevus” [8]. Interestingly, Argenziano et al also stated that most Reed nevi are dermatoscopically characterized by a starburst pattern, whereas most pigmented Spitz nevi are typified by a globular pattern [26]. Like other authors, Argenziano et al possibly were confused by pathologic reports in which lesions otherwise stereotypical of Reed nevus were diagnosed as Spitz nevus because of the presence of “Spitz cells.”

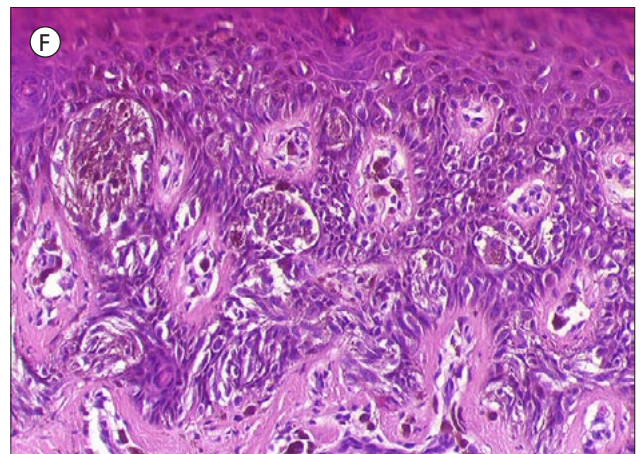
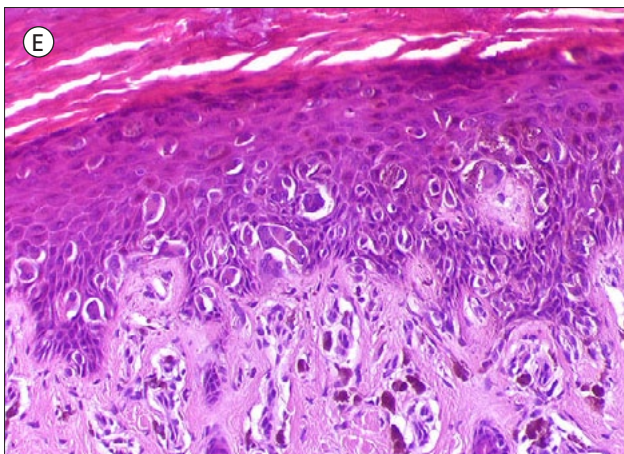
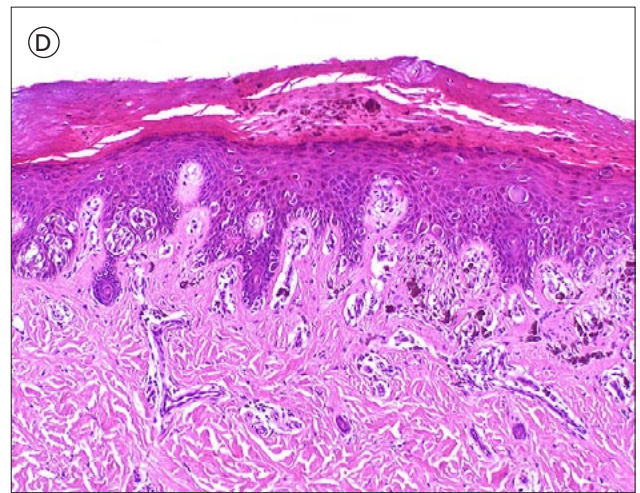
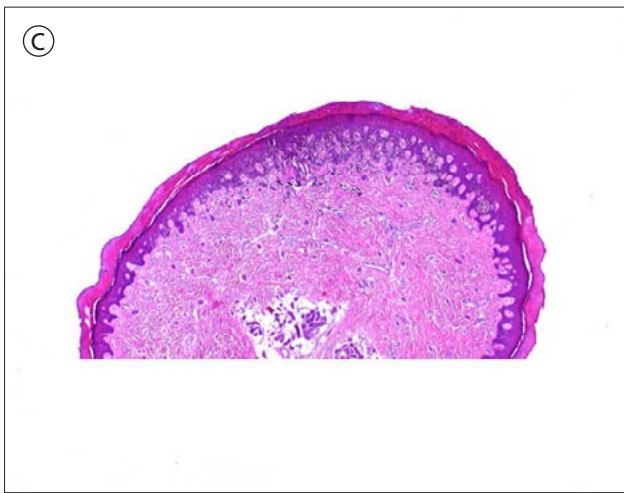
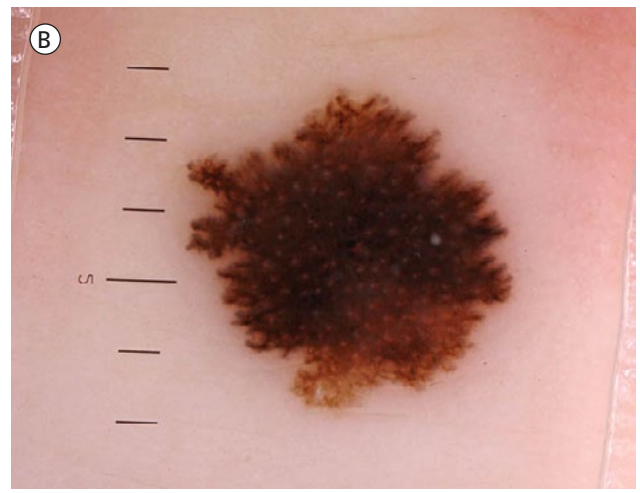
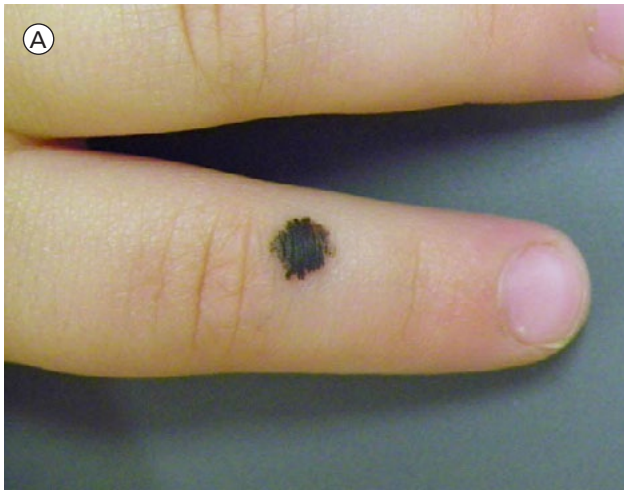
To overcome these difficulties, we established a dermatopathologic classification scheme in advance (Figure 1) that did not include cytomorphologic criteria, hence allowing the presence of “Spitz cells” within Reed nevi and a better correlation between dermatopathologic and dermatoscopic findings. The classification that we propose is based on architectural features in combination with assessment of pigmentation because these features can be observed clinically, dermatoscopically and dermatopathologically.

With the use of these criteria, all but two nevi could be unanimously classified as either pigmented Spitz or Reed nevus. Lesions classified as Reed nevi are characterized by the typical dermatoscopic pattern of peripheral radial lines or pseudopods (Figures 2, 3). Lesions dermatopathologically classified as Spitz nevi did not show this dermatoscopic pattern. They are typified by a pattern of clods (Figures 4, 5). The good correlation between dermatopathology and dermatoscopy underlines the validity of our proposed classification. From a dermatopathologic point of view, we found that pigmented Spitz nevi are also typified by pronounced hypergranulosis and acanthosis. Epithelioid and polymorphous melanocytes are more common in Spitz nevi but may occur also in Reed nevi ( $\geq 40\%$ ). Our data supports that epithelioid melanocytes are an expected finding in (early) Reed nevi (Figure 6), thus the distinction of an epithelioid-cell variant seems unnecessary to us. Here, spindle-cell and epithelioid-cell variants seem to be, at most, the extremes within a continuum without further importance, particularly

as an epithelioid or spindle-cell morphology obviously has no clinical or dermatoscopic correlate [12]. This observation highlights that cytologic features are not decisive and that architectural pattern is better suitable for a confident distinction of these nevi. Horizontally oriented nests in the epidermis correspond to pseudopods or radial lines dermatoscopically (Figures 2,3). These epidermal fascicles are a typical feature of the horizontal growth pattern of Reed nevi, which differs from the more vertical growth pattern of Spitz nevi. We have termed this growth pattern fascicular growth pattern and contrast it with the nested growth pattern of pigmented Spitz nevi. In pigmented Spitz nevi epidermal melanocytes are arranged in nests that are visible as clods or globules on dermatoscopy and not in fascicles (Figures 4, 5). Vertically oriented epidermal nests can be found in both types of nevi. According to our concept, Spitz nevi tend to involve the reticular dermis, whereas Reed nevi never do. Pigmented Spitz and Reed nevus are also distinguishable by their capacity of melanin production, which corresponds to their dermatopathologic and dermatoscopic appearance. Pigmented Spitz nevi are dermatoscopically typified by a brown structureless center or exhibit brown clods superimposed by thick gray reticular lines (Figures 4, 5). In contrast, Reed nevi are predominantly typified by a structureless black center, which corresponds to abundant melanin in the stratum corneum (Figures 2, 3). Although some fully developed Reed nevi reveal peripheral reticular lines, circumferential radial lines or pseudopods are the prevailing feature. In contrast to the opinion of Argenziano et al, we believe that the “starburst pattern” with radial lines or pseudopods is restricted to Reed nevi, whereas pigmented Spitz nevi are characterized by the pattern of clods (“globules”), similar to some congenital-type nevi [27]. We have to admit, however, that Spitz and Reed nevi in their initial phase might be indistinguishable on both a histopathologic and dermatoscopic point of view, as both start with a pattern of clods (“globular pattern”) and incipient Reed nevi might exhibit the color brown instead of black.

In sum, most cases of pigmented Spitz and Reed nevi can be reliably distinguished by integration of clinical, dermatoscopic and dermatopathologic findings. “Spitz cells” and “spindle cells” should not be regarded as the decisive criterion to differentiate between these two entities. Because of the low sample size, our data should be regarded as preliminary, but our concept may serve as a valid hypothesis that could be verified or falsified in larger studies. The differentiation of pigmented Spitz from Reed nevi is not only an academic exercise. Nevi with a typical Reed pattern might have a different fate than lesions with Spitz pattern. It seems reasonable to us that Reed nevi disappear by transepidermal elimination of melanocytes, whereas fibroplasia and sclerosis are findings in late Spitz nevi, but this hypothesis has to be





**Figure 6.** Reed nevus in a 4-year-old boy at the dorsum of the left index finger with a diameter of 4 mm (A) dermatoscopically exhibiting a pattern of radial lines or pseudopods (B). Dermatopathologically (C-F), the nevus is composed of monomorphic, fusiform, markedly pigmented melanocytes predominantly aggregated in largish round nests at the dermo-epidermal junction (F), but also of solitary polymorphous, in part multinuclear, melanocytes (“Spitz cells”) with central pagetoid spread (E). It can be diagnosed as Reed nevus upon integration of dermatoscopic findings, but also because of abundant melanin in the stratum corneum (D) and a band-like infiltration by melanophages within the papillary dermis (D). [Copyright: ©2012 Bär et al.]

confirmed in future studies. With regard to differential diagnosis we believe that it is safe to leave a lesion with a typical Reed pattern in prepubescent children. And finally, we are convinced that the distinction between different types of nevi is a prerequisite for a classification of melanocytic nevi based on molecular findings.

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