

Dermoscopy Patterns of Fibroepithelioma of Pinkus

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Background: Fibroepithelioma of Pinkus (FeP) is a rare variant of basal cell carcinoma that may clinically mimic a number of benign skin tumors. While the dermoscopic features of basal cell carcinoma have been studied extensively, little is known about the dermoscopic features of FeP.

Observations: Retrospective evaluation of clinical records and digital clinical dermoscopic images of 10 histopathologically proved FePs (6 nonpigmented and 4 pigmented) was performed. Clinically, no FeP was correctly identified and, in half of all patients, a clinical differential diagnosis of purely benign skin lesions was made. Dermoscopy enabled the correct diagnosis in 9 of 10 FePs, based on the presence of fine arborizing ves-

sels, either alone or associated with dotted vessels, and white streaks (in 100%, 70%, and 90% of lesions, respectively). In the 4 pigmented FePs, a structureless gray-brown area of pigmentation and variable numbers of gray-blue dots were observed, in addition.

Conclusions: Dermoscopy is helpful in diagnosing FeP and in differentiating this variant of basal cell carcinoma from other benign skin tumors commonly included in the clinical differential diagnosis. This presumes, however, that dermoscopy is used as a first-line examination for all skin lesions, not only for those that are clinically suspect.

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FIBROEPITHELIOMA OF PINKUS (FeP), first described in 1953 by Hermann Pinkus¹ as a premalignant fibroepithelial tumor, is considered an uncommon variant of basal cell carcinoma (BCC). It manifests clinically as a solitary, and sometimes multiple, flesh-colored or slightly brown-gray, well-demarcated plaque.²⁻⁴ Infrequently, FeP may be pedunculated, polypoid, or ulcerated or may invade underlying tissues.⁵⁻¹¹ It typically is found on the trunk of persons aged 40 to 60 years and is thought to have an equal sex distribution.² Although it shows a certain predilection for the lumbosacral area,² it is not limited to this region and may develop on other body sites, including the extremities, abdomen, head, and genitalia.⁵⁻⁷

Among a number of differential diagnoses, dermal melanocytic nevus, pedunculated fibroma, acrochordon (skin tag), and seborrheic keratosis are most commonly listed.²⁻⁴ Histopathologically, FeP is characterized by numerous thin anastomosing cords of basaloid cells extending downward from the epidermis into the dermis in a honeycomb pattern, embedded within a fibrotic stroma.¹² These peculiar features are thought to be caused by initial invasion of a BCC along the eccrine ducts, with subsequent obliteration of the ductal lumen.^{13,14}

As a variant of BCC, early detection and adequate treatment of FeP is warranted. Dermoscopy is a noninvasive diagnostic technique that enables the clinician to better differentiate a variety of pigmented skin lesions, including melanoma and pigmented BCC.¹⁵ While the dermoscopic patterns of BCC have been studied extensively,^{15,16} little is known about the dermoscopic patterns in FeP.¹⁷ We describe the dermoscopic features observed in a series of 10 patients with FeP.

METHODS

Dermoscopic images of 10 histopathologically proved FePs, collected at the Pigmented Lesion Clinics (Naples and Turin, Italy) between December 1, 2003, and December 31, 2005, were evaluated for the presence of various dermoscopic features. Clinical data obtained for each patient included the following: age and sex, location and clinical appearance of the lesion, clinical diagnosis, and dermoscopic diagnosis.

Clinical and dermoscopic images of each lesion were obtained using compact epiluminescent microscopy (DermLite Foto lens; 3Gen, LLC, Dana Point, Calif) coupled with a digital camera (Nikon Coolpix 4500; Nikon Corp, Tokyo, Japan) for the early detection of skin cancer. A clinical diagnosis, including an eventual additional differential diagnosis, was recorded before the dermoscopic diagnosis. Each

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Table 1. Patient Demographic Data and Clinical Records for 10 Patients With Fibroepithelioma of Pinkus

Patient/Sex/ Age, y	Location	Clinical Diagnosis	Dermoscopic Diagnosis	History of BCC	Histopathologic Diagnosis
1/F/45	Sacral region	BCC	FeP	+	FeP and junctional nevus*
2/M/55	Sacral region	BCC, DN	FeP	+	FeP*
3/F/65	Abdomen	DN, F	FeP	-	FeP*
4/M/54	Sacral region	DN, F	FeP	-	FeP*
5/F/49	Sacral region	DN, F	FeP	-	FeP
6/M/70	Sacral region	SK, DN	FeP	-	FeP
7/F/73	Sacral region	BCC, DN	BCC, DN, SK	-	FeP*
8/F/56	Sacral region	SK, BCC	FeP	-	FeP*
9/M/32	Sacral region	BCC, DN	FeP	-	FeP*
10/F/74	Axilla	DN	FeP	+	FeP*

Abbreviations: BCC, basal cell carcinoma; DN, dermal nevus; F, fibroma; FeP, fibroepithelioma of Pinkus; SK, seborrheic keratosis; +, yes; -, no.
*Diagnosis made at the Department of Dermatology, Second University of Naples, Naples, Italy.

lesion was evaluated by 2 of us (I.Z. and G.A.) for the presence of the following dermoscopic features: vascular pattern, pigmented structural pattern, and additional dermoscopic features. All biopsy specimens were routinely stained with hematoxylin-eosin.

RESULTS

PATIENTS DEMOGRAPHIC DATA AND GENERAL RESULTS

Ten histopathologically proved FePs were collected, including 6 nonpigmented and 4 partially pigmented lesions. The tumors were obtained from 6 women and 4 men who ranged in age from 32 to 75 years (median age, 57.3 years). Eight lesions (80%) were located on the lumbosacral region of the trunk and 2 lesions (20%) were located on the abdomen and axilla, respectively (**Table 1**).

No FeP was correctly identified at clinical examination, with the clinical differential diagnoses including dermal nevus (80%), BCC (50%), fibroma (30%), and seborrheic keratosis (20%). Although BCC was considered in 5 patients, in the other 5 patients the clinical differential diagnosis included purely benign skin lesions, which are not routinely excised (Table 1).

Fibroepithelioma of Pinkus was associated with a history of BCC in 1 patient (patient 1) and with concomitant multiple superficial BCCs on the trunk (patient 2) and an ulcerated nodular BCC on the nose (patient 10). Patient 1 had a history of multiple, previously treated BCCs, and when first seen had FeP in association with a melanocytic nevus. Although surgical excision of the colliding tumors was planned, the patient did not attend the scheduled intervention but returned 8 months after the initial visit. A baseline digital dermoscopic image was recorded; thus, we were able to observe the changes in this FeP with time. In particular, it was noted that there was a substantial increase in overall size compared with the baseline image, while the colliding nevus remained unchanged. At this later visit, the entire lesion was surgically removed, and histologic analysis confirmed the diagnosis of FeP in association with a junctional melanocytic nevus. Patient 2 had multiple superficial BCCs, and we

initiated treatment of the superficial BCCs and FeP with 5% imiquimod cream, according to established protocols.¹⁸ Whereas all superficial BCCs resolved after a 6-week course of treatment, the FeP failed to respond, which led to its subsequent surgical excision.

DERMOSCOPIC PATTERNS

The most striking result of our study is that dermoscopy enabled a correct diagnosis of FeP in 9 of 10 patients (Table 1). The only FeP not correctly identified was that described in our recently published original case report on the dermoscopy patterns of FeP (patient 7).¹⁷

At dermoscopy, all lesions were red to light brown–yellow, associated with irregularly shaped and distributed linear, elongated telangiectasias that were sharply focused. We have named these *fine arborizing vessels* (FAVs), representing a variation on the theme of arborizing vessels (**Table 2**). However, in contrast to the arborizing telangiectasias typically observed in BCC, FAVs are generally smaller in caliber and have less evident ramifications (**Figure 1**). In addition to this particular vascular pattern, we also noted the presence of peculiar white septal lines (white streaks) in 90% of lesions (Figure 1).

In 4 FePs there was partial pigmentation characterized by an irregularly distributed, structureless gray-brown area of pigmentation associated with a few to numerous gray-blue dots (**Figure 2** and **Figure 3**). This pigmentation was clinically visible in only 2 of 4 lesions.

Additional dermoscopic features of the lesions included dotted vessels (70%), milialike cysts (60%), and ulceration (50%) (Table 2). Dotted vessels were mainly located at the periphery and were always associated with FAVs, while milialike cysts were only seen as single units per lesion.

COMMENT

The results of our study underscore the value of dermoscopy in clinical practice for the differentiation and accurate diagnosis of benign and malignant, pigmented and nonpigmented skin tumors. The most striking result of our study

Table 2. Dermoscopic Features in Fibroepithelioma of Pinkus

Patient	Fine Arborizing Vessels	Whitish Striae	Dotted Vessels	Milialike Cysts	Ulceration	Gray-Brown Coloration	Gray-Blue Dots
1	+	+	-	+	+	-	-
2	+	+	+	-	-	-	-
3	+	+	+	-	-	-	-
4	+	+	+	-	+	-	-
5	+	-	-	+	-	-	-
6	+	+	+	+	+	-	-
7*	+	+	-	+	+	+	+
8*	+	+	+	+	-	+	+
9*	+	+	+	-	+	+	+
10*	+	+	+	+	-	+	+
Lesions, No. (%)	10 (100)	9 (90)	7 (70)	6 (60)	5 (50)	4 (40)	4 (40)

Abbreviations: +, present; -, absent.

*These cases of fibroepithelioma of Pinkus showed slight pigmentation.



Figure 1. Clinical image (inset) and dermoscopic image of a nonpigmented fibroepithelioma of Pinkus. In this case (patient 4), the clinical differential diagnosis included dermal nevus and fibroma. The dermoscopic image demonstrates numerous fine arborizing vessels, peripheral dotted vessels, and white streaks. In addition, small ulcerations are seen, characterized by red to light brown blood crusts (hematoxylin-eosin, original magnification $\times 10$).

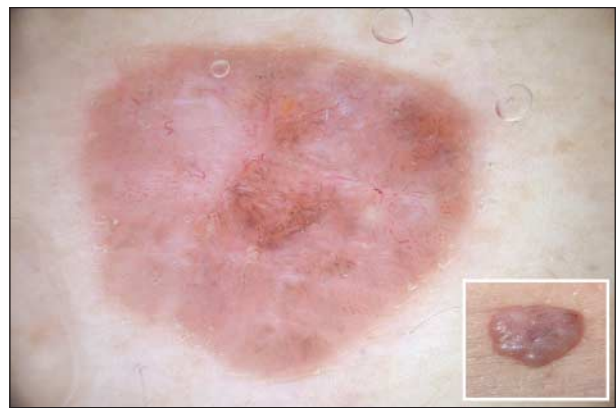


Figure 2. Clinical image (inset) and dermoscopic image of a pigmented fibroepithelioma of Pinkus (patient 8). The dermoscopic image demonstrates, in addition to fine arborizing vessels, dotted vessels and white streaks, an irregularly distributed gray-brown structureless area of pigmentation, and multiple small gray-blue dots (hematoxylin-eosin, original magnification $\times 10$).

is that dermoscopy enabled correct identification of 9 of 10 FePs, compared with the clinical examination, which included at least 1 benign skin tumor in 5 patients and exclusively benign skin tumors in the remaining 5 patients. This result can be explained by the presence of repetitive dermoscopic features including FAVs, which were seen in all FePs. Fine arborizing vessels were clearly distinct from the comma-shaped vessels found in dermal nevi and the regular hairpin-shaped vessels typically found in fibroma or seborrheic keratosis.^{15,19} Fine arborizing vessels represent a variation on the theme of arborizing vessels described in BCC¹⁶; however, in contrast to arborizing vessels described in BCC, FAVs are typically smaller in caliber and have less evident ramifications. Seven FePs also exhibited dotted vessels, which frequently are seen in melanocytic skin lesions or psoriasis, whereas 6 FePs exhibited milialike cysts, which are associated with seborrheic keratosis.^{15,19-21} In a previous study from our group that investigated vascular patterns in skin tumors, dotted vessels were highly predictive (90%) for melanocytic skin tumors, in particular for Spitz nevus and melanoma.¹⁹ Spitz nevus commonly exhibits regularly distributed dotted ves-

sels as the only type of vascular pattern, while melanoma often reveals dotted vessels in combination with other types of vascular structures (called polymorphous pattern), such as linear-irregular vessels or milky red globules or areas. In the present study, we observed no single FeP with dotted vessels as the only vascular structure, but they were always combined with FAVs (ie, polymorphous pattern, by definition). Fine arborizing vessels in FeP can be differentiated from linear-irregular vessels in melanoma because the former are more elongated, less kinked, and sharply in focus. In our previous study, a polymorphous vascular pattern had a positive predictive value of 68.4% for malignant skin tumors.¹⁹ In the present study, a polymorphous pattern was seen in 70% of FePs, underscoring the importance of this pattern in the diagnosis of malignant skin lesions. However, the diagnosis of a given skin lesion must not be based on the presence of a single dermoscopic criterion; rather, the overall context of the lesion should be considered, including all clinical and dermoscopic criteria.^{15,21}

Another feature observed in 90% of FePs was white streaks, which appeared as white septal lines throughout



Figure 3. Clinical image (inset) and dermoscopic image of a slightly pigmented fibroepithelioma of Pinkus (patient 9). The dermoscopic image demonstrates a polymorphous vascular pattern composed of fine arborizing and dotted vessels, with the dotted vessels typically located at the periphery. An additional gray-brown area of pigmentation and a single gray-blue dot close to the central ulceration can be seen (hematoxylin-eosin, original magnification $\times 10$).

the tumor. To our knowledge, white streaks have not been described in other skin tumors. This feature corresponds histopathologically to the marked fibrosis typical of FeP (**Figure 4**)¹⁷ and should be differentiated from regression structures in melanocytic skin lesions.²² Four FePs in our series were slightly pigmented and exhibited, in addition to FAVs or white streaks, an irregularly distributed, gray-brown structureless pigmentation and a variable number of small gray-blue dots. Again, the latter seem to represent variations on the theme of the multiple gray-blue globules previously described in BCC, which may reflect the etiologic similarity of FeP and BCC.¹⁵⁻¹⁷ Yet, FeP failed to respond to topical therapy with 5% imiquimod cream, which is considered an effective treatment for BCC.¹⁸ However, we are hesitant to draw any conclusions about the efficacy of such topical treatments for FeP based on a single observation.

Our study also raised some intriguing points that require further consideration. That 5 FePs were clinically considered benign highlights the importance of using dermoscopy as a first-level procedure for all lesions, not only for clinically preselected suspect lesions.²³ Given that in our patients the clinical diagnosis included benign lesions such as dermal nevus, fibroma, and seborrheic keratosis, it could be assumed that these FePs would have been missed clinically. This leads to the issue of the reported frequency of FeP. Although exact epidemiologic data are lacking, FeP is generally considered a rare skin tumor.¹⁻¹⁴ At the Department of Dermatology, Second University of Naples, 7 FePs were diagnosed within 1 year, which is an unexpectedly high number of such lesions, considering the general opinion about their frequency. To date, most of the epidemiologic data have been drawn from single case reports and histopathologic studies of varying sample sizes.¹⁻¹⁴ However, inasmuch as FeP frequently mimics benign skin lesions that neither raise clinical suspicion nor are routinely excised, it might be speculated that the reported low incidence might be due, in part, to underdiagnosis. On the other hand, UV-exposure is considered an important factor

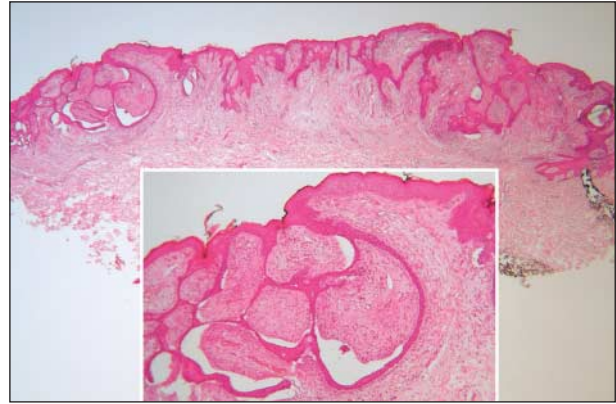


Figure 4. Histopathologic image of the fibroepithelioma of Pinkus shown in Figure 1. Numerous thin anastomosing strands of basaloid cells extend downward from the epidermis into the dermis, embedded within a fibrotic stroma. Inset, Note the artifactual clefts at the interface between the tumor strands and the stroma (hematoxylin-eosin, original magnification $\times 25$).

in the pathogenesis of BCC and, consequently, it could be speculated that the sunny climate of southern Italy might favor the development of FeP, as a peculiar variant of BCC, in that geographic region.

Certainly, our preliminary study of only 10 lesions is far too small to draw any definitive conclusions about the frequency of FeP in a given population. In addition, that 9 of 10 FePs were correctly diagnosed at dermoscopy might have been influenced by our personal experience based on our original case report on the dermoscopic patterns of FeP.¹⁷ Moreover, the sensitivity and specificity of our proposed dermoscopic criteria for FeP and the lack of response of 1 FeP to treatment with topical 5% imiquimod cream require further investigation.

In conclusion, our study demonstrates that FeP seems to exhibit repetitive dermoscopic features, including FAVs, either alone or in combination with dotted vessels, and white streaks, which may enable the clinical diagnosis. However, this presumes that dermoscopy is used in diagnosis of all skin lesions, whether benign or suspected of being malignant.

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Author Contributions: Dr Argenziano had full access to all data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Zalaudek. *Acquisition of data:* Zalaudek, Ferrara, Broganelli, Moscarella, Mordente, Giacomel, and Argenziano. *Analysis and interpretation of data:* Zalaudek. *Drafting of the manuscript:* Zalaudek, Ferrara, Moscarella, Mordente, and Giacomel. *Critical revision of the manuscript for important intellectual content:* Broganelli and Argenziano. *Administrative, technical, and material support:* Zalaudek, Ferrara, Broganelli, and Giacomel. *Study supervision:* Argenziano.

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REFERENCES

1. Pinkus H. Premalignant fibroepithelial tumors of skin. *Arch Dermatol Syphilol*. 1953;67:598-615.
2. Barr RJ, Herten RJ, Stone OJ. Multiple premalignant fibroepitheliomas of Pinkus: a case report and review of the literature. *Cutis*. 1978;21:335-337.
3. Camacho Martinez F, Armijo Mareno M, de Dulanto F. Premalignant fibroepithelioma tumor of Pinkus. *Actas Dermosifiliogr*. 1976;67:5-10.
4. Lang PG, Maize J. Basal cell carcinoma. In: Rigel DS, Friedman RJ, Dzubow LM, Reintgen DS, Bystry J-C, Marks R, eds. *Cancer of the Skin*. Philadelphia, Pa: Elsevier Saunders; 2005:101-133.
5. Misago N, Narisawa Y. Polypoid basal cell carcinoma on the perianal region: a case report and review of the literature. *J Dermatol*. 2004;31:51-55.
6. Cohen PR, Tschen JA. Fibroepithelioma of Pinkus presenting as a sessile thigh nodule. *Skinmed*. 2003;2:385-387.
7. Scherbenske JM, Kopeloff IH, Turiansky G, Sau P. A solitary nodule on the chest: fibroepithelioma of Pinkus. *Arch Dermatol*. 1990;126:955-958.
8. Colvett KT, Wilson FC, Stanton RA. Atypical presentation of metastatic basal cell carcinoma. *South Med J*. 2004;97:305-307.
9. Heymann WR, Soifer I, Burk PG. Penile premalignant fibroepithelioma of Pinkus. *Cutis*. 1983;31:519-521.
10. Hartschuh W, Schulz T. Merkel cell hyperplasia in chronic radiation-damaged skin: its possible relationship to fibroepithelioma of Pinkus. *J Cutan Pathol*. 1997;24:477-483.
11. Bryant J. Fibroepithelioma of Pinkus overlying breast cancer. *Arch Dermatol*. 1985;121:310.
12. Lever WF, Schaumburg-Lever G. Fibroepithelioma. *Histopathology of the Skin*. 6th ed. Philadelphia, Pa: JB Lippincott; 1983:570.
13. Mehregan AH. Proliferation of sweat ducts in certain diseases of the skin. *Am J Dermatopathol*. 1981;3:27-31.
14. Stern JB, Haupt HM, Smith RR. Fibroepithelioma of Pinkus: eccrine duct spread of basal cell carcinoma. *Am J Dermatopathol*. 1994;16:585-587.
15. Argenziano G, Soyer HP, Chimenti S, et al. Dermoscopy of pigmented skin lesions: results of a consensus meeting via the Internet. *J Am Acad Dermatol*. 2003;48:679-693.
16. Menzies SW, Westerhoff K, Rabinovitz H, Kopf AW, McCarthy WH, Katz B. Surface microscopy of pigmented basal cell carcinoma. *Arch Dermatol*. 2000;136:1012-1016.
17. Zalaudek I, Leinweber B, Ferrara G, Soyer HP, Ruocco E, Argenziano G. Dermoscopy of fibroepithelioma of Pinkus. *J Am Acad Dermatol*. 2005;52:168-169.
18. Geisse J, Caro I, Lindholm J, Goltz L, Stampone P, Owens M. Imiquimod 5% cream for the treatment of superficial basal cell carcinoma: results from two phase III, randomized, vehicle-controlled studies. *J Am Acad Dermatol*. 2004;50:722-733.
19. Argenziano G, Zalaudek I, Corona R, et al. Vascular structures in skin tumors: a dermoscopy study. *Arch Dermatol*. 2004;140:1485-1489.
20. Zalaudek I. Dermoscopy subpatterns of nonpigmented skin tumors. *Arch Dermatol*. 2005;141:532.
21. Zalaudek I, Argenziano G, Di Stefani A, et al. Dermoscopy in general dermatology. *Dermatology*. 2006;212:7-18.
22. Zalaudek I, Argenziano G, Ferrara G, et al. Clinically equivocal melanocytic skin lesions with features of regression: a dermoscopic-pathological study. *Br J Dermatol*. 2004;150:64-71.
23. Zalaudek I, Ferrara G, Di Stefani A, Argenziano G. Dermoscopy for challenging melanoma; how to raise the "red flag" when melanoma clinically looks benign. *Br J Dermatol*. 2005;153:200-202.

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