Association of Shiny White Blotches and Strands With Nonpigmented Basal Cell Carcinoma
Evaluation of an Additional Dermoscopic Diagnostic Criterion

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IMPORTANTANCE Basal cell carcinoma (BCC) is the most common type of skin cancer and is usually nonpigmented. Shiny white structures (SWSs) are frequently present in BCC.

OBJECTIVE To determine the diagnostic accuracy of various morphologies of SWSs for diagnosis of nonpigmented BCC.

DESIGN, SETTING, AND PARTICIPANTS Nonpigmented skin tumors, determined clinically and dermoscopically, were identified from a database of lesions consecutively biopsied over a 3-year period (January 2, 2009, to December 31, 2012) from a single dermatology practice. Data analysis was conducted from October 9, 2014, to November 15, 2015. Investigators blinded to histopathologic diagnosis evaluated the polarized dermoscopic images for the presence of SWSs, which were categorized as blotches, strands, short white lines, and rosettes. Measures of diagnostic accuracy for BCC were estimated. Participants included 2375 patients from a dermatologic clinic in Plantation, Florida. Review of the medical records identified 2891 biopsied skin lesions; 457 of these were nonpigmented neoplasms.

MAIN OUTCOMES AND MEASURES Diagnosis of BCC with dermoscopy compared with all other diagnoses combined was the primary outcome; the secondary outcome was diagnosis of BCC compared with amelanotic melanoma. We calculated diagnostic accuracy measured as odds ratios (ORs), sensitivity, and specificity of shiny white blotches and/or strands for the diagnosis of BCC.

RESULTS Of the 457 nonpigmented neoplasms evaluated, 287 (62.8%) were BCCs, 106 (23.2%) were squamous cell carcinoma, 39 (8.5%) were lichen planus–like keratosis, 21 (4.6%) were melanomas, and 4 (0.9%) were nevi. The prevalence of SWSs was 49.0% (n = 224). In multivariate analysis (reported as OR [95% CI]) controlling for age, sex, and anatomical location, the presence of any SWS was associated with a diagnosis of BCC (2.3 [1.5-3.6]; P < .001). Blotches (6.3 [3.6-10.9]; P < .001), strands (4.9 [2.9-8.4]; P < .001), and blotches and strands together (6.1 [3.3-11.3]; P < .001) were positively associated with BCC. Shiny white blotches and strands together had a diagnostic sensitivity of 30% and specificity of 91%.

CONCLUSIONS AND RELEVANCE The combined presence of shiny white blotches and strands is associated with high diagnostic specificity for nonpigmented BCC.
B
asal cell carcinoma (BCC) is the most common malign
ant neoplasm in fair-skinned populations world-
wide.1-4 In the United States, age-adjusted BCC inci-
dence rates have doubled over the past 2 decades, with recent
estimates of 1019 cases per 100,000 person-years for women
and 1488 cases per 100,000 person-years for men.5 Although
it rarely metastasizes, BCC can cause significant local tissue
destruction and cosmetic impairment, making treatment op-
tions challenging in advanced stages.6 Diagnosing BCC early has
the greatest short-term potential to decrease patient morbid-
ity and health care costs associated with treatment.

Dermoscopic features for pigmented BCCs were origi-
nally described by Menzies et al7 in 2000. These features in-
clude large blue-gray ovoid nests, multiple nonaggregated blue-
grey dots, ulceration; arborizing “tree-like” telangiectasia,
spoke-wheel areas, and leaflike areas. These criteria were es-
tablished using nonpolarized dermoscopy and were selected
because they have high (>80%) diagnostic specificity.7,8 How-
ever, 4 of the 6 criteria are limited exclusively to pigmented BCC,
which accounts for less than 10% of all BCCs in fair-skinned
populations.7-9 Lallas et al10 recently found that approxi-
mately 30% of clinically amelanotic BCCs reveal pigment struc-
tures under dermoscopy; however, the vast majority of BCCs
still have no pigment criteria dermoscopically.

Polarized dermoscopy has emerged as the screening mod-
dality of choice because it does not require a liquid interface
or skin contact and enhances the visualization of certain der-
moscopic structures, including vessels, vascular blush, and
shiny white structures (SWSs).11 Few studies have focused on
the dermoscopic features present in clinically and dermoscopi-
cally nonpigmented BCCs, particularly using polarized der-
moscopy. Of the 6 criteria for pigmented BCC identified by Men-
zies et al,7 only 2 (arborizing vessels and ulceration) may be
helpful in identifying nonpigmented BCCs. However, Lallas et
al12 demonstrated that both ulceration and arborizing vessels
are features associated mainly with the nodular subtype of BCC.
Additional proposed dermoscopic criteria for BCC include short
fine telangiectasias (SFTs), multiple small erosions, concen-
tric structures, and multiple in-focus blue-gray dots. How-
ever, the sensitivity and specificity of these individual crite-
ria for BCC diagnosis have not been determined, and the inter-
rater reliability of some criteria, such as SFT, has been shown
to be poor.12-14 Hence, there is a need to identify addi-
tional features to aid in the detection of nonpigmented BCCs,
including those lacking ulceration or arborizing vessels. Pre-
vious studies12-17 observed that many nonpigmented BCCs
manifest SWSs when viewed with polarized light, but these der-
moscopic features have not been formally and systematically
evaluated for their diagnostic potential. The primary objec-
tive of this study was to determine measures of diagnostic ac-
curacy for various morphologies of SWSs in the diagnosis of
nonpigmented BCC.

Methods
This study was approved by the institutional review board
of the University of Miami. All images originated from a
deidentified database of lesions consecutively biopsied in a
dermatology practice in Plantation, Florida. Standard proce-
dures in this practice included capturing clinical and der-
moscopic images of all lesions selected for biopsy. Images
were captured with a Nikon 1 camera (Nikon USA, Inc) using
DermLite DL2 pro HR for polarized images and DermLite
fluid for nonpolarized images at 10-fold magnification (3Gen, LLC).
Only the individual lesion’s close-up clinical (cropped images without patient identifiers) and dermo-
scopic images were included in the study database. One of
us (C.N.-D.) reviewed the clinical and dermoscopic images of
all lesions biopsied over a 3-year period (January 2, 2009-
December 31, 2012) and selected those without discernible
pigment. Any tumors revealing pigmented structures clini-
cally or dermoscopically were excluded.13 Collision tumors
were also excluded. Dermatofibromas were excluded using
the rationale that, although this tumor frequently manifests
SWSs,18 they can typically be identified via clinical and der-
moscopic evaluation without difficulty. Seborrheic kerato-
ses were also excluded since they are rarely amelanotic, are
easy to identify based on clinical and dermoscopic morphol-
ogy, and are infrequently biopsied; as a result of these fac-
tors, data on seborrheic keratoses were not available for
analysis. Anatomical site of the tumor and participants’ age
and sex were recorded.

Image Assessment
Two of us (C.N.-D. and S.B.) initially trained in dermoscopic
analysis by an expert dermoscopist (A.A.M.) were blinded to
histopathologic diagnosis and reviewed the polarized and non-
polarized contact dermoscopic images of all lesions for con-
sensus agreement on the presence of SWSs. A third reviewer
(A.A.M.) resolved disagreement when consensus could not be
achieved.

If SWSs were present, they were classified as (1) blotches
(also known as clods; discrete, small or large structureless
areas); (2) strands (long thick or thin lines, randomly distrib-
uted or parallel, and not orthogonally oriented); (3) rosettes
(cluster of 4 white dots in a 4-leaf clover–like arrangement);
and (4) short white lines (also known as crystalline structures
and chrysalis; fine lines that intersect or are oriented ortho-
gonally to each other).19,20 Shiny white structures that could not
be classified into one of these specific morphologies were cat-
egorized as nonspecified.

All lesions were evaluated for the presence or absence of
any Menzies criteria. Lesions without Menzies criteria were
considered featureless. Using the consensus method de-
scribed above, featureless lesions were further evaluated for
the presence of additional BCC criteria, including SFT; mul-
tiple in-focus, blue-gray dots; multiple small erosions; and
concentric structures. To evaluate interrater accuracy in classi-
ing the morphology of SWSs, we calculated the Cohen κ coef-
cient between the 2 reviewers (C.N.-D. and S.B.) in a ran-
domly selected subset of lesions (n = 28).

Statistical Analysis
Distribution of participant and lesion characteristics was
evaluated by histologic diagnosis of the study lesions.

Descriptive statistics and graphical methods were used to describe the study participants and the characteristics of the individual lesions. Based on bivariate cross-tabulations, relative frequencies for lesion characteristics for squamous cell carcinoma (SCC), lichen planus-like keratosis (LPLK), melanoma, and nevi were relatively consistent; therefore, a dichotomous variable for histopathologic diagnosis (BCC vs all other diagnoses combined) was created and used as the primary study outcome variable. As a secondary outcome, BCC vs amelanotic melanoma was evaluated. Univariate associations between lesion diagnosis and participant characteristics were assessed using unpaired, 2-tailed tests and Pearson χ² analysis for continuous and categorical variables, respectively.

Preliminary estimates of the diagnostic accuracy of lesion characteristics were made by dichotomizing the study sample (BCC vs all other diagnoses combined) with each of the dermoscopic features evaluated. Regression models for binary outcomes were created using the general estimating equations approach with a log link and an exchangeable correlation structure. Because significant associations were observed between sex, age, and lesion diagnosis, these variables were included in all of the regression models to control for potential confounding. Estimates for sensitivity and specificity are presented with their associated 95% CIs. Crude and adjusted odds ratios (ORs) for the association between lesion diagnosis (BCC vs all other diagnoses combined) and dermoscopic features were performed using logistic regression. Adjusted models included age, sex, and anatomical location (head and neck vs other area). Data analysis was conducted from October 9, 2014, to November 15, 2015. All analyses were performed with Stata, version 12.1 (StataCorp).

Results

A review of records on 2375 patients identified 2891 skin lesions; of these, 457 were nonpigmented neoplasms, including 287 (62.8%) BCCs, 106 (23.2%) SCCs, 39 (8.5%) LPLKs, 21 (4.6%) melanomas, and 4 (0.9%) nevi. Demographics and anatomical location of the BCC neoplasms are reported in Table 1. Basal cell carcinoma lesions were more likely than other diagnoses to be located on the head and neck, to occur in younger individuals, and to occur in men (P < .05 for all comparisons).

Basal cell carcinoma subtype distribution was nodular for 223 lesions (77.7%), superficial for 25 (8.7%), and morpheaform for 36 (12.5%). Histologic subtype was unavailable for 3 BCCs (1.0%).

The prevalence of SWSs in the entire study sample was 49.0% (n = 224): 54.0% (n = 155) of BCCs, 41.5% (n = 44) of SCCs, 41.0% (n = 16) of LPLKs, 42.9% (n = 9) of melanomas, and 0% of nevi (Table 2). The prevalence of SWSs did not differ by BCC subtype (P = .83, analyzed only for nodular vs superficial BCC). When stratified by morphology, of the 457 nonpigmented neoplasms, strands (29.5% [135 of 457]) were the most prevalent SWSs identified, followed by blotches (28.9% [132]), short white lines (9.0% [41]), rosettes (8.8% [40]), and nonspecified (4.6% [21]).

In multivariate analysis (reported as OR [95% CI] controlling for age, sex, and anatomical location, the presence of any SWSs associated with a diagnosis of BCC (2.3 [1.5-3.6]; P < .001) (Table 3). Blotches (6.3 [3.6-10.9]; P < .001), strands (4.9 [2.9-8.4]; P < .001), and blotches and strands together (6.1 [3.3-11.3]; P < .001) (Figure) were all positively associated with a diagnosis of BCC. Short white lines (0.4 [0.2-0.9]; P = .02) and nonspecified SWSs (0.3 [0.1-0.8]; P = .02) were inversely associated with a diagnosis of BCC. Rosettes were not associated with a diagnosis of BCC (0.6 [0.3-1.3]; P = .22).

The overall sensitivity, specificity, and area under the receiver operating characteristic curve for blotches, strands, and blotches and strands together were similar. For all participants, the presence of blotches alone had the highest area under the receiver operating characteristic curve (0.63); sensitivity was 0.38 (95% CI, 0.33-0.44) and specificity was 0.84 (95% CI, 0.77-0.89). The use of blotches and

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%)</th>
<th>BCC (n = 287)</th>
<th>Other Diagnoses (n = 170)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD), y</td>
<td>64.3 (14.1)</td>
<td>62.5 (14.7)</td>
<td>67.5 (12.6)</td>
<td>&lt;.001a</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>282 (61.7)</td>
<td>190 (66.2)</td>
<td>92 (54.1)</td>
<td>.01b</td>
</tr>
<tr>
<td>Female</td>
<td>175 (38.3)</td>
<td>97 (33.8)</td>
<td>78 (45.9)</td>
<td></td>
</tr>
<tr>
<td>Anatomical location</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head and neck</td>
<td>134 (29.3)</td>
<td>110 (38.3)</td>
<td>24 (14.1)</td>
<td></td>
</tr>
<tr>
<td>Trunk</td>
<td>124 (27.1)</td>
<td>86 (30.0)</td>
<td>38 (22.3)</td>
<td>&lt;.001b</td>
</tr>
<tr>
<td>Extremity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>84 (18.4)</td>
<td>49 (17.1)</td>
<td>35 (20.6)</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>113 (24.7)</td>
<td>42 (14.6)</td>
<td>71 (41.8)</td>
<td></td>
</tr>
<tr>
<td>Genitalia</td>
<td>1 (0.2)</td>
<td>0</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>1 (0.2)</td>
<td>0</td>
<td>1 (0.6)</td>
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</table>

Abbreviation: BCC, basal cell carcinoma.
a Determined by unpaired, 2-tailed t test.
b Determined by Pearson χ² analysis.
strands together as a diagnostic criterion resulted in a lower sensitivity (30%) but higher specificity (91%) compared with the use of each structure (blotches or strands) independently. The positive predictive value, negative predictive value, positive likelihood ratio, and negative likelihood ratio for blotches and strands together for the diagnosis of BCC was 84.3% (95% CI, 75.8%-90.8%), 43.3% (95% CI, 38.2%-48.7%), 3.2 (95% CI, 1.9-5.2), and 0.8 (95% CI,

Table 2. Cross-Classification of Dermoscopic Characteristics by Lesion Diagnoses

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>BCC (n = 287)</th>
<th>Other Diagnoses</th>
<th>P Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Combined (n = 170)</td>
<td>SCC (n = 106)</td>
<td>LPLK (n = 39)</td>
</tr>
<tr>
<td>Blotches</td>
<td>110 (38.3)</td>
<td>22 (12.9)</td>
<td>16 (15.1)</td>
</tr>
<tr>
<td>Strands</td>
<td>108 (37.6)</td>
<td>27 (15.9)</td>
<td>18 (17.0)</td>
</tr>
<tr>
<td>Blotches and strands</td>
<td>86 (30.0)</td>
<td>16 (9.4)</td>
<td>13 (12.3)</td>
</tr>
<tr>
<td>Short white lines</td>
<td>18 (6.3)</td>
<td>23 (13.5)</td>
<td>14 (13.2)</td>
</tr>
<tr>
<td>Rosettes</td>
<td>20 (7.0)</td>
<td>20 (11.8)</td>
<td>13 (12.3)</td>
</tr>
<tr>
<td>Nonspecified SWSs</td>
<td>8 (2.8)</td>
<td>13 (7.6)</td>
<td>7 (6.6)</td>
</tr>
<tr>
<td>SWSs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>155 (54.0)</td>
<td>69 (40.6)</td>
<td>44 (41.5)</td>
</tr>
<tr>
<td>None</td>
<td>132 (46.0)</td>
<td>101 (59.4)</td>
<td>62 (58.5)</td>
</tr>
</tbody>
</table>

Abbreviations: BCC, basal cell carcinoma; LPLK, lichen planus-like keratosis; SCC, squamous cell carcinoma; SWSs, shiny white structures.

* P value based on Pearson χ² for the association between dermoscopic features and diagnosis (BCC vs other diagnoses combined).

Table 3. Estimates for the Association Between BCC and Other Diagnosis and Dermoscopic Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Crude OR (95% CI)</th>
<th>P Value</th>
<th>Adjusted OR (95% CI)*</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blotches</td>
<td>4.2 (2.5-6.9)</td>
<td>&lt;.001</td>
<td>6.3 (3.6-10.9)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Strands</td>
<td>3.2 (2.0-5.1)</td>
<td>&lt;.001</td>
<td>4.9 (2.9-8.4)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Short white lines</td>
<td>0.4 (0.2-0.6)</td>
<td>.01</td>
<td>0.4 (0.2-0.9)</td>
<td>.02</td>
</tr>
<tr>
<td>Rosettes</td>
<td>0.6 (0.3-1.1)</td>
<td>.08</td>
<td>0.6 (0.3-1.3)</td>
<td>.22</td>
</tr>
<tr>
<td>Blotches and strands</td>
<td>4.1 (2.3-7.3)</td>
<td>&lt;.001</td>
<td>6.1 (3.3-11.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Nonspecified SWSs</td>
<td>0.3 (0.1-0.9)</td>
<td>.22</td>
<td>0.3 (0.1-0.8)</td>
<td>.02</td>
</tr>
<tr>
<td>Any SWSs</td>
<td>1.7 (1.2-2.5)</td>
<td>.006</td>
<td>2.3 (1.5-3.6)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Abbreviations: BCC, basal cell carcinoma; OR, odds ratio; SWSs, shiny white structures.

* Adjusted for age, sex, and anatomical location (head and neck vs other).

Figure. Dermoscopic Features of Basal Cell Carcinoma

A, Pink lesion displaying numerous shiny white blotches (blue arrowheads) and strands (black arrowheads) with polarized dermoscopy. In addition, small erosions (crosses) are displayed (original magnification, ×10). B, Blotches and strands cannot be visualized with nonpolarized dermoscopy (original magnification, ×10).
Table 4. Proposed Updated Criteria for Basal Cell Carcinoma

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Sensitivity, %</th>
<th>Specificity, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large blue-gray ovoid nests</td>
<td>55</td>
<td>97/99</td>
</tr>
<tr>
<td>Arborizing telangiectasia</td>
<td>52</td>
<td>77/92</td>
</tr>
<tr>
<td>Multiple blue-gray globules</td>
<td>27</td>
<td>87/97</td>
</tr>
<tr>
<td>Ulceration</td>
<td>27</td>
<td>87/97</td>
</tr>
<tr>
<td>Leaflike structures</td>
<td>17</td>
<td>100/100</td>
</tr>
<tr>
<td>Spoke-wheel-like structures</td>
<td>10</td>
<td>100/100</td>
</tr>
<tr>
<td>Blotches and strands</td>
<td>30</td>
<td>91/95</td>
</tr>
</tbody>
</table>

* The number on the left represents the specificity for a specific dermoscopic feature compared with a subset of melanocytic and nonmelanocytic benign lesions; the number on the right represents the specificity evaluated only against melanoma. Data obtained from Menzies et al.7

0.7-0.8), respectively. When the presence of blotches and strands was compared for BCC against melanoma as the only diagnosis, the specificity rose to 95.2% (95% CI, 76.2%-99.9%).

Finally, of the 54 BCCs lacking Menzies criteria, 24 (44.4%) displayed additional BCC criteria: SFTs in 10 lesions (41.7%); multiple in-focus, blue-gray dots in 10 (41.7%); multiple small erosions in 4 (16.7%); and concentric structures in 1 (4.2%). Twenty-six of the 54 BCCs (48.1%) without Menzies criteria included both blotches and strands. Of these 26 BCCs, 3 (11.5%) were superficial; 1 (3.8%) was morpheaform; and 22 (84.6%) were nodular. Short fine telangiectasias were present in 5 BCCs (19.2%); multiple in-focus, blue-gray dots in 3 (11.5%); and concentric structures in 1 (3.8%). In all, 17 of the 26 BCCs (65.4%) lacking Menzies criteria but displaying both blotches and strands could be identified only by the presence of SWSs. Of note, 4 of the 287 BCCs (1.4%) did not display any Menzies criteria, non-classic criteria and/or blotches, or strands.

The interrater accuracy for differentiating the various SWS morphologies from each other was determined. The Cohen κ coefficient values were 0.96, 0.86, 0.89, and 0.93 for blotches, strands, short lines, and rosettes, respectively.

Discussion

In this study, we evaluated the diagnostic accuracy of various morphologies of SWSs for the diagnosis of BCC among clinically and dermoscopically nonpigmented neoplasms using polarized dermoscopy. We identified the criterion of blotches and strands together to be significantly associated with BCC, having sensitivity and specificity of 30% and 91%, respectively. These measures of diagnostic accuracy are comparable to the original criteria identified for pigmented BCC (Table 4).7 In addition, the new criteria of SWSs may help us to detect a subset of nonpigmented BCCs that are otherwise unrecognizable using the current Menzies criteria.

Shiny white structures are visible only with polarized dermoscopy and can exhibit a variety of morphologies.21 Some of these structures (blotches, strands, and short white lines) have been correlated with collagen alterations, such as fibrosis, in the underlying stroma.22 For this subset of SWSs, it is thought that collagen bundles have birefringent properties that cause rapid randomization of polarized light, which explains why they can be seen only with polarized dermoscopy.23

However, rosettes are thought to be an optical property resulting from the interaction between polarized light and keratin-filled adnexal openings.24 This optical effect is likely similar to the appearance of Maltese crosses found in lipid-filled fluids (as in the urine of patients with nephrotic syndrome).20,24

Although SWSs can be found in a variety of benign and malignant skin tumors, their presence should increase suspicion for malignant neoplasms, including BCC, SCC, and melanoma.25,26 Although the probable management of any lesion displaying SWSs would be the same (ie, biopsy), the morphology of SWSs may help to further delineate between the different malignant tumors; with rosettes, blotches and strands, and short fine lines increasing the likelihood for SCC, BCC, and melanoma, respectively.19,27 On the benign spectrum, dermatofibromas and LPLKs also commonly manifest SWSs. However, in most cases, clinical and dermoscopic evaluation with palpation should allow for accurate identification of dermatofibromas without biopsy. For this reason, we chose to exclude dermatofibromas from this investigation. In contrast, LPLKs remain a challenging lesion to identify clinically and are commonly biopsied; therefore, LPLKs were included in the study.28,29

The prevalence of SWSs in BCC and other skin tumors has been investigated. One study19 identified SWSs in 122 BCCs (69.1%) and in 71 melanomas (28.5%). Shiny white blotches (previously referred to as shiny white areas) were present in a higher percentage of BCCs than melanomas (39 [28.5%] vs 8 [3.2%]),19 which is similar to the prevalence of shiny white blotches in the study herein (38.3% of BCC and 9.5% of melanomas, respectively). In a second study21 restricted to BCC, shiny white areas were found in 38 (25.5%) of the lesions, shiny white lines and strands together in 103 (69.1%) of the lesions, and rosettes in 17 (11.4%) of the lesions.

Another study20 examined 538 lesions, including BCC, SCC, actinic keratosis, LPLK, and melanoma, and found that SWSs were observed in 208 (38.7%), which is comparable to the overall prevalence in our study (224 [49.0%]). Basal cell carcinomas were more likely than other diagnoses to display a combination of white shiny areas and lines or strands (61 of 191 [31.9%]; P < .001) and to have white shiny lines distributed without any organized pattern (data not specified; P < .001). Finally, Popadić15 recently reported a prevalence of 51.7% (78 of 151 BCCs) for large shiny white areas in BCC, which we believe is the same structure as the blotches reported herein.

The diagnosis of nonpigmented BCC, particularly the superficial histologic subtype, remains challenging in clinical practice since they often lack any of the Menzies BCC criteria originally described for pigmented BCC.12,16,17 A plethora of case reports and case series have evaluated additional dermoscopic criteria for BCC, including SFTs, multiple small erosions, and multiple in-focus, blue-gray dots and concentric structures, among others.13,14,16 These
features may be observed in up to 26.1% of BCCs and may be more common in superficial BCCs. Furthermore, Altamura et al. showed that approximately 14% to 16% of non-pigmented and lightly pigmented BCCs have short, fine superficial telangiectasias, and approximately 8% to 11% of these tumors may have small erosions that could aid in their diagnosis. However, none of these features has been formally evaluated for measures of validity.

Twenty-six of 54 nonpigmented BCCs (48.1%) that did not have Menzies criteria could be identified using blotches and strands as a diagnostic criterion. Moreover, 65.4% of these BCCs did not display any other BCC criteria. This finding has a significant potential effect given the high burden of disease of BCC. Furthermore, our high interobserver reliability, which ranged from 0.86 to 0.96 for the 4 morphologies of SWS, strengthens our results.

Limitations of this study include its retrospective design, use of images from a single dermatology practice, and relatively small sample size, particularly the number of melanomas included. We also were unable to stratify the prevalence or diagnostic accuracy of SWSs by additional criteria, such as anatomical location, skin type, skin color, or presence of other dermoscopic features.

Conclusions

Shiny white blotches and/or strands identified with polarized light on dermoscopy had a diagnostic specificity of 91% for nonpigmented BCC. With this high level of specificity, these features should be added as another criterion that can be relied on for the detection of BCC.
NOTABLE NOTES

Dermatologic Marvels—Hypertrichosis

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Carnivals and circuses have always attracted spectators to witness the spectacular, unusual, and intriguing. These events would expose people with genetic abnormalities, displaying a phenotype that could easily entice a crowd. The most famous, Fedor Jefitchew, also known as “Jojo the Dog-Faced Boy,” was exhibited in the late 1800s. Most recently in 2011, 11-year-old Supatra Sasuphan from Thailand was named the “World’s Hairiest Girl” by the Guinness Book of World Records. Both of these alluring humans suffered from a rare dermatologic condition known as generalized hypertrichosis.1

Hypertrichosis is a disturbance in villous hair development. Villous hair is often shorter, lightly pigmented, and medullated, and is uniformly distributed over the forehead, eyelids, nose, cheeks, and preauricular regions.2 Because hypertrichosis often presents with varied abnormalities of the teeth and broadened facial features, it has been given the characteristic laymen description of a “dog face” or even a humanoid canine “werewolf.” Hypertrichosis can be classified as generalized hypertrichosis, which occurs over the entire body, or localized hypertrichosis, which is restricted to a certain area. It is postulated that the abnormal hair growth is associated with an abnormal telogen phase of the hair growth cycle.3 In contrast to hirsutism, hypertrichosis is not associated with abnormal androgen secretion or other endocrine abnormalities but has been linked to alterations in chromosome 8q22, suggesting that genes involved with hair growth and distribution are localized to this chromosomal region.3

The first documented case of hypertrichosis was Petrus Gonzales, who was born in the Canary Islands in 1556.7 He was presented as a gift to French nobles and subsequently put on display as a rare enigma. Since his time, others with similar genetic abnormalities have been exploited for their phenotypic anomalies, often exhibited in sideshows and circuses. The history of this rare medical anomaly is fraught with turmoil and sadness, as those affected were scorned, ridiculed, and mocked when displayed as “side show freaks.” Many people with hypertrichosis were thought of as werewolves, frequently presumed to be dangerous. These prejudices, owing to lack of information of the underlying pathophysiology of hypertrichosis, were unwarranted.

There have been more than 20 documented cases of hypertrichosis, some of which have been featured in Ripley’s Believe it or Not and The Guinness Book of World Records.3 With a better understanding of the underlying mechanisms of hypertrichosis, the perception of this rare genetic abnormality can be changed, and an accepting public response should be promoted. People with hypertrichosis should be celebrated in our society because they have persevered through prejudice while having contributed drastically to the current pool of knowledge about this rare dermatologic condition.

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