STUDY

Variations in the Dermoscopic Features of Acquired Acral Melanocytic Nevi

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Objective: To investigate the dermoscopic features of acquired acral melanocytic nevi (AAMN) in a white population in Turkey.

Design: Prospective population-based study.

Setting: University dermatology department dermoscopy unit.

Patients: A total of 2625 patients admitted to our dermoscopy unit.

Interventions: Patients were examined for AAMN clinically and dermoscopically with a digital imaging system, and AAMN larger than 7 mm and dermoscopically suggestive lesions were excised and examined histopathologically. For other nevi, digital dermoscopic follow-up at 6-month intervals was recommended.

Results: A total of 188 AAMN were observed in 138 patients. The most common dermoscopic pattern was the parallel furrow pattern (58.5%). The other patterns seen were fibrillar (12.2%), latticelike (6.4%), homogeneous (6.4%), globulostreaklike (5.3%), reticular (4.3%), lobular (2.1%), nontypical (3.2%), and the pattern suggestive of malignancy (1.6%). All 39 excised lesions (20.7%) were benign. In addition, within 1 year, some changes in dermoscopic features were observed in 24 of the 33 lesions observed on digital dermoscopic follow-up (73%).

Conclusions: There may be many variations in AAMN. In our population, although the parallel furrow pattern is the most common pattern, as reported in Japanese populations, fibrillar and latticelike patterns occurred in lower proportions. Conversely, the homogeneous pattern is more frequent and may be considered one of the major patterns in the white population. In addition, changes in the dermoscopic features of AAMN may occur, even during short-term follow-up.

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DERMOSCOPY IS A NONINVASIVE TOOL FOR THE EVALUATION OF PIGMENTED SKIN LESIONS. ACRAL PIGMENTED LESIONS HAVE SPECIAL DERMOSCOPIC FEATURES DUE TO THE REGIONAL ANATOMY. IN PEOPLE OF COLOR, THE ACRAL AREA IS THE MOST COMMON SITE OF MELANOMA; THEREFORE, DERMOSCOPY HAS BECOME USEFUL TO ENHANCE THE DIAGNOSIS OF ACRAL LESIONS IN THE JAPANESE POPULATION.1-3 OTHERS HAVE STUDIED ACRAL NEVI IN THE PREDOMINANTLY WHITE POPULATIONS OF SPAIN AND ITALY.6,7 IN THE PRESENT STUDY, WE INVESTIGATE THE DERMOSCOPIC FEATURES OF ACQUIRED ACRAL MELANOCYTIC NEVI (AAMN) IN THE WHITE POPULATION OF TURKEY.

See also pages 1372 and 1423

Lentigo simplex was classified as an acquired melanocytic nevus. Acral nevi on dorsal and subungal locations and lesions with congenital anamnesis were excluded. Dermoscopic images of all the lesions were stored in a digital imaging system (Molemax; Derma Instruments LP, Vienna, Austria) at 30-fold magnification, with a maximum field of 1 cm, and also with a digital camera (Dermlight FOTO; 3Gen LLC, San Juan Capistrano, California). According to the criteria established by Saida,4 lesions larger than 7 mm and dermoscopic-
Patients with 33 lesions prototypical (pattern was seen in 57 lesions (51.8%), of which 24 were lesions; 58.5%). Among those, single-line parallel furrow most common pattern was the parallel furrow pattern (110 (6.4%) (Figure 2J). In 5 of these, the latticelike pattern was observed and their ratios are summarized in Figure 2I. In 3 of these, the fibrillar pattern was associated by dots (Figure 2F), and 6 were associated with a fine reticulated background (Figure 2D). Variants of the parallel furrow pattern included double dotted line (27 lesions; 24.5%) (Figure 2E), single dotted line (23 lesions; 21%) (Figure 2F), and double line (3 lesions; 2.7%) (Figure 2G).

The fibrillar pattern was observed in 23 lesions (12.2%) (Figure 2H). In 3 of these, the fibrillar pattern was accompanied by dots and/or globules (Figure 2I).

The latticelike pattern was observed in 12 lesions (6.4%) (Figure 2J). In 5 of these, the latticelike pattern was seen partially together with the parallel furrow pattern in small areas (Figure 2K).

The homogeneous pattern was seen also in 12 lesions (6.4%) (Figure 2L). Three of these were papular lesions. In 2 of the lesions with the homogeneous pattern, a few globules accompanied the homogeneous pigmentation.

Ten lesions exhibited dark brown globules and brown linear or curvilinear streaklike structures (5.3%) (Figure 3A) similar to pattern type 2 described by Akasu et al. We called this pattern globulostreaklike.

The reticular pattern was observed in 8 lesions (4.3%). Six of these were located on the skin folds (plicae) of the palms, and the reticular pigmentation was not associated with any other pattern (Figure 3B). The other 2 lesions were located on the soles, but not on the skin folds. In 1 of these, the reticular pigmentation was partially associated with a linear pigmentation suggesting a parallel furrow pattern in the upper part (Figure 3C). In the other lesion, on a background of reticular pigmentation, regular globules were located on the ridges suggesting the “crista dotted pattern” (Figure 3D). The crista dotted pattern is composed of dots and globules distributed on the ridges near the openings of the eccrine ducts in a regular fashion.
The globular pattern was observed in 4 lesions (2.1%). This pattern was composed of dots and/or globules on a diffuse, light brown pigmentation. However, in 1 of the lesions, the globules were observed in a random, nonparallel distribution, while the other 3 lesions were associated with a parallel pattern. Of these 3 lesions with the parallel pattern, 1 showed dots and globules distributed evenly all through the lesion on a background of light brown pigmentation; the second exhibited a similar appearance, but the dots and globules were distributed more heavily and especially spared the openings of the eccrine ducts; and the third showed the crista dotted pattern.

Six lesions that could not be classified into any of these patterns and were not suggestive of malignancy either clinically or dermoscopically were diagnosed as having a non-typical pattern (3.2%). These were all papular lesions. Four of them were excised and diagnosed histopathologically as compound or intradermal nevi. There was no cytologic atypia in any of them, but 2 of them showed fibrosis.

Three lesions were clinically and dermoscopically suggestive of malignancy (1.6%). In 1 of them, a blue-white structure was observed (Figure 4A). This symmetric, grayish-brown papular lesion was an intradermal nevus histopathologically (Figure 4B). The second suggestive lesion showed atypical features with black pigmentation filling the ridges and the sulci, forming a kind of irregular blotch (Figure 4C); however, it was a compound nevus histopathologically (Figure 4D). The third suggestive lesion was dark with a diameter of 7 mm; it exhibited an atypical pigmented networklike area (Figure 4E), and histopathologic examination revealed a dysplastic nevus (Figure 4F).

A total of 39 lesions were excised (20.7%), including the ones excised after a follow-up period. All of these lesions were histopathologically benign (3 lentigo simplex, 12 junctional nevi, 18 compound nevi, 5 intradermal nevi, and 1 dysplastic nevus). The relationship between the dermoscopic patterns and the histopathologic diagnoses is detailed in Table 3. In all dermoscopic patterns, junctional nevi (including lentigo simplex) or compound nevi outnumbered intradermal types (32 of 36; 88.9%) except the pattern suggestive of malignancy. The 3 lesions that showed the suggestive pattern were compound nevus, intradermal nevus, and dysplastic nevus.

In all patients whose lesions did not require excision, digital follow-up was recommended; only 22 of these (with 33 lesions) have continued follow-up. The images taken during those visits (range, 1-3) were stored. The

mean follow-up time was 11 months (range, 6-21 months). No change occurred in 9 of these lesions (27%). Evolution in the pigmentation was seen in 20 lesions, 14 becoming lighter and 6 becoming darker. Evaluation of the lesion size showed that 12 lesions enlarged and 7 became smaller. In 1 lesion, the enlargement and the darkening were seen together in the summertime (Figure 5A and B), and that same lesion regressed during the winter and became even smaller and lighter than it was in the baseline image (Figure 5C). As for the dermoscopic structures, only 3 lesions showed a decrease in the number of dots, and 1 lesion (on an 8-year-old patient) that originally showed the fibrillar pattern changed after 6 months into a parallel furrow pattern, double dotted-line variant (Figure 5D and E).

**COMMENT**

The major dermoscopic patterns seen in acral melanocytic lesions are the parallel furrow pattern, the lattice-like pattern, and the fibrillar pattern. The parallel furrow pattern is reported to be the most common, found in proportions of 44%, 42%, 42.1%, and 52.9% by Saida et al, Saida et al, Altamura et al, and Malvehy and Puig, respectively. Oguchi et al have also reported this pattern to be the most common in their series of 108 acral lesions in which 90.7% were acquired and the rest were congenital acral melanocytic nevi. The proportion was 58.5% in the present study.

The single-line parallel furrow pattern serves as the parallel furrow pattern prototype. Single dotted-line, double-line, double dotted-line, fine reticulated background, and associated with dots and/or globules are the other reported variations of the parallel furrow pattern. In addition, this pattern was described by Akasu et al as type 3. Our findings were similar: the parallel furrow pattern was the most common pattern found in our white population also. However, in addition to the previously reported variations, we found that this pattern was also accompanied by homogeneous brown pigmentation in 15 of 110 lesions (13.6%) (Figure 5B), and all of these variations were seen in association with only the single-line type of the parallel furrow pattern in our study.

The percentage of lesions with the fibrillar pattern has been reported as 12%, 33%, 6.2%, and 10.8% by Saida et al, Saida et al, Malvehy and Puig, and Altamura et al, respectively. Akasu et al have described this pattern as type 1. This pattern was observed in 12.2% in our study,
and it was accompanied by dots and globules in a few cases (Figure 2I). To our knowledge, only Saida et al\(^1\) have reported this association with brown globules.

The latticelike pattern was reported to be 27%, 19%, 12.4%, and 14.9% by Saida et al,\(^1\) Saida et al,\(^4\) Malvehy and Puig,\(^6\) and Altamura et al,\(^7\) respectively. Akasu et al\(^2\) have described this pattern as type 5. This proportion was 6.4% in our study. Saida et al\(^4\) reported this pattern to be accompanied by dots and globules in some cases, but we did not observe this association. However, we observed that in 5 of the 12 latticelike lesions (41.7%), the latticelike pattern was partially joined together with the parallel furrow pattern in small areas (Figure 2K); that is, the pattern was only partially formed. This is not an unexpected finding because the latticelike pattern is considered a variant of the parallel furrow pattern.\(^1,3\)

The homogeneous pattern, globular pattern, and acral network pattern were described as 3 novel, minor, benign patterns by Malvehy and Puig.\(^6\) The homogeneous pattern was observed in 7.1% of lesions by these authors\(^5\) and in 9.3% by Altamura et al.\(^7\) This pattern was described by Saida et al\(^4\) as the most prevalent nontypical pattern. In the present study, 6.4% of the lesions exhibited this pattern.

The major benign dermoscopic patterns in our series are similar to those reported in Japanese studies,\(^1,3,4\) the parallel furrow pattern being the most common. However, the fibrillar pattern (12.2%) and the latticelike pattern (6.4%) were less common in our study than in the Japanese studies, in agreement with the reports of Malvehy and Puig\(^6\) and Altamura et al.\(^7\)

We also found that the homogeneous pattern occurred in equal proportion to the latticelike pattern, which is one of the major patterns. Although Malvehy and Puig\(^6\) considered the homogeneous pattern one of the minor patterns, the frequency of occurrence of the homogeneous pattern in their series (7.1%) was greater than that of one of their major patterns, the fibrillar pattern (6.2%).\(^6\) Probably related to their cohort selection of patients with atypical mole syndrome, Malvehy and Puig\(^6\) preferred not to report the homogeneous pattern as a major one. Altamura et al\(^7\) observed the homogeneous pattern in 9.3% of the examined lesions, which is very close to another major pattern, the fibrillar pattern (10.8%). According to these 3 studies, we can conclude that in the white population, the homogeneous pattern is seen more frequently than in Japanese people and perhaps may be considered a major dermoscopic pattern in the acral area.

The globular pattern was described by Malvehy and Puig\(^6\) (5.2%), Altamura et al\(^7\) (5.4%), Saida et al,\(^4\) and Akasu et al.\(^2\) Among the lesions showing a globular pattern in the present study (2.1%), 1 showed globules with nonparallel distribution, similar to the cases reported by Malvehy and Puig\(^6\); however, 3 lesions showing the parallel pattern supported the findings of Saida et al\(^2\) and

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**Table 3. The Relationship Between AAMN Dermoscopic Patterns and Histopathologic Diagnoses**

<table>
<thead>
<tr>
<th>Dermoscopic Pattern</th>
<th>Lesions, No.</th>
<th>Lentigo Simplex</th>
<th>Junctional</th>
<th>Compound</th>
<th>Intradermal</th>
<th>Dysplastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel furrow</td>
<td>13</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Fibrillar</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Latticelike</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Homogeneous</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Globulostreaklike</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reticular</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Globular</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nontypical</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Suspect for malignancy</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>3</td>
<td>12</td>
<td>18</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Abbreviation: AAMN, acquired acral melanocytic nevi.
Akasu et al. included the crista dotted pattern as a type 4 nevus.

Malvehy and Puig found the acral reticular pattern—a reticulated pigmentation similar to the pigment network of nonglabrous skin without any association with parallel furrow, fibrillar, or latticelike pattern—in 2.4% of the lesions in their series. However, Saida et al. observed this reticulated pigmentation as a background in 5.8% of the parallel furrow patterns in their study of 121 melanocytic acral nevi. Altamura et al. reported this pattern in 2.1% and a combination of reticular pigmentation with parallel furrow pattern or latticelike pattern in 1.8%. This latter combination was reported as a novel dermoscopic pattern and designated as transition pattern because it was seen on the lateral aspect of the fingers where volar skin converted into nonglabrous skin.

We observed the reticular pattern in 4.3% of the lesions in the present study. Two of the lesions with the reticular pattern, which were not located on the skin folds, were associated partially with the parallel furrow pattern (Figure 3C) (similar to the transition pattern described by Altamura et al.) or associated with the crista dotted pattern (Figure 3D). However, the former lesion was not located on the transition point between the glabrous and nonglabrous skin, as reported by Altamura et al. The remaining 6 lesions in our study located on the skin folds (plicae) showed pure reticular pigmentation without any association with other patterns (Figure 3B). This observation of pure reticular pigmentation on skin plicae only, all of which were on the palms, is noteworthy; perhaps it results from special anatomic features.

Akasu et al. described 5 different patterns in 500 nevi. Type 2 showed a mottled appearance with round to oval bluish pigmented spots attached to irregular brownish pigmentation. This pigmentation was annular or in some cases dotted and unrelated to the sulcus or crista supercilia. In our study, a pattern similar to that of the type 2 with annular pigmentation was observed in 5.3% of the lesions (Figure 3A). However, these bluish pigmented spots appeared as dark brown globules in our cases. We called this pattern globulostreaklike to be more descriptive and practical in daily use.

Dermoscopic features that could not be classified into any of the typical patterns have been described as nontypical pattern and reported at proportions of approximately 17%, 6%, 13.8%, and 13.7% of observed acral melanocytic nevi. It was suggested that a nontypical pattern could be explained by the normal evolution of the lesions into mature nevi, the presence of fibrosis in some lesions being responsible for the loss of acral structures, or by the existence of histologic atypia. We observed this feature in 3.2% of the lesions in our study. No histologic atypia was observed in these lesions; however, 2 of them showed fibrosis. This lower proportion of 3.2% in our study is probably owing to our identifying the globulostreaklike pattern as a separate pattern. Probably such cases were considered nontypical pattern in other studies. However, we believe that the globulostreaklike pattern should be considered a distinct minor pattern because it is typical and not exceptional, with an incidence of 5.3% in the present study.

Some dermoscopic features were reported to be suggestive of melanoma. In the present study, 3 lesions were considered suggestive of malignancy because of the presence of a blue-white structure (Figure 4A), irregular pigmentation (Figure 4C), and an atypical pigment networklike area (Figure 4E). None of them was malignant histopathologically, but 1 showed melanocytic proliferation with cytologic atypia and was diagnosed as a dysplastic nevus. This lesion was the one with the atypi-
cal pigment networklike area, and this dermoscopic appearance was the clue to its nature.

Histopathologically, in all dermoscopc patterns studied (except the one suggestive of malignancy) junctional nevi (including lentigo simplex) or compound nevi outnumbered intradermal types, as expected. The acral sites are exceptional areas where junctional melanocytes do not stop their proliferation in adulthood.

Importantly, we also observed changes in the dermoscopic appearance of lesions over time. We observed differences in 73% of the studied lesions on follow-up within a year, including darkening or fading in pigmentation, enlargement or decrease in size, and changes in dermoscopic structure and dermoscopic pattern. Short-term changes may occur in acral nevi without necessarily signaling a real evolution in either direction (toward malignancy or disappearance). Malvehy and Puig reported that some of the lesions with homogeneous pigmentation evolved from a fibrillar, filamentous, or parallel furrow pattern to a homogeneous pattern and in some cases disappeared completely. Similarly, in our study, a fibrillar pattern lesion on an 8-year-old patient was replaced over a 6-month period by a parallel furrow pattern, double-line variant (Figure 5D and E). As reported by Miyazaki et al., melanocytic nevi with the fibrillar pattern show a tendency to appear on the sites directly pressed by the body's weight, and in these nevi, the cornified layer shows a slanting arrangement. Therefore, moving the skin surface in a horizontal direction with the probe may change the fibrillar pattern to a parallel furrow pattern. In the case of the nevi evolution in our 8-year-old patient, this may also be a possibility. Further studies with digital follow-up of AAMN are needed to clarify their evolution.

CONCLUSIONS

1. There may be some variations in acral nevi patterns besides the 3 well-known major patterns.

2. Of the major patterns seen in AAMN, the parallel furrow pattern is the most common in white and Japanese populations; while the fibrillar and latticelike patterns occur in lower proportions in both races, they are less common in white patients than in Japanese patients.

3. The homogeneous pattern is seen more frequently in white patients than in Japanese patients and may be considered one of the major patterns in the white population.

4. The globulostreaklike pattern may be considered a minor pattern because it is typical and not exceptional (5.3%) compared with the other minor patterns (homogeneous, globular, and reticular patterns showing proportions of 7.1%, 5.2%, and 2.4%, respectively, in the study by Malvehy and Puig, and 9.3%, 5.4%, and 2.1%, respectively, in the study by Altamura et al; in the present study, the proportions were 6.4%, 2.1%, and 4.3%, respectively).

5. The acral reticular pattern seen in the present study exhibiting pure reticular pigmentaion only on the skin plicae, without any association with other patterns, was noteworthy.

6. Changes may occur in dermoscopic features of AAMN, even over a short-term follow-up period.

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