Dermoscopy of Patients With Multiple Nevi

Improved Management Recommendations Using a Comparative Diagnostic Approach

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Objective: To assess the outcome on management recommendations of a comparative approach vs a morphologic approach in evaluating dermoscopic images of lesions from a series of patients with multiple nevi.

Design: In a 2-step study, 6 experienced dermoscopists were asked to provide management recommendations (excision or follow-up) for a series of lesions from patients with multiple nevi based on dermoscopic images of the lesions. In the first step, participating dermoscopists evaluated individual images of lesions based only on morphologic structure (morphologic approach). In the second step, the same lesions were grouped by patient, allowing the participants to evaluate the lesions in the context of other nevi from the same patient (comparative approach).

Setting: Academic referral center.

Patients: Seventeen patients with 190 lesions (184 monitored nevi, 4 excised nevi, and 2 excised melanomas).

Main Outcome Measure: Using pooled data from each step, excision recommendation rates for the comparative approach and the morphologic approach were calculated.

Results: Using the morphologic approach, 55.1% of overall recommendations favored excision; using the comparative approach, the rate decreased to 14.1%. The 2 melanomas included in the study were correctly judged to merit excision by all participants in step 1 and in step 2.

Conclusion: Among patients with multiple nevi, evaluation of equivocal lesions in the context of a patient’s other nevi results in a lower rate of excision recommendations compared with evaluation of individual lesions based on morphologic structure alone.

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Much of the economic burden in melanoma screening results from biopsies and excisions of benign lesions, especially in patients with multiple melanocytic nevi. The clinical morphologic criteria summarized by the ABCD rule (asymmetry, border irregularity, color variegation, and diameter >6 mm) are not useful in assessing nevi in these patients because many of their benign lesions have positive ABCD features. Dermoscopy has been shown to reduce the number of unnecessary excisions in melanoma screening, however, irregular dermoscopic features are noted in numerous lesions among patients with multiple nevi, and unnecessary biopsies and excisions are still performed. More reliable screening strategies are needed to improve melanoma screening performance in this patient population.

Given that clinical and dermoscopic assessments of morphologic features in individual lesions may be insufficient among patients with multiple atypical nevi, a useful additional strategy might be a comparative approach in which individual lesions are evaluated in the context of a patient’s overall nevus profile. This approach is based on recognition of the “signature nevus” or the “ugly duckling sign.” Most individuals have a predominant group of nevi sharing a similar clinical (or dermoscopic) appearance (the signature nevus); therefore, a lesion outside of the common nevus pattern in a given individual (the ugly duckling) must be considered with suspicion, even if it does not

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fulfill the ABCD or melanoma-specific dermoscopic criteria. Conversely, an atypical lesion may be completely normal in an individual whose skin is covered with similar lesions.

The objective of this study was to assess the outcome on management recommendations of 2 approaches to dermoscopy. A dermoscopic morphologic approach (assessment of a single lesion) vs a dermoscopic comparative approach (assessment of multiple lesions) was compared in a series of patients with multiple nevi.

We conducted a 2-step study in which 6 experienced dermoscopists were asked to provide management recommendations for a series of pigmented skin lesions from a limited number of patients based on dermoscopic images of the lesions. In the first step (morphologic approach), dermoscopic images were presented as consecutive cases. No additional information was provided, and the participants were asked to formulate management recommendations (excision or follow-up) on the basis of the morphologic features found in the individual lesions. In the second step (comparative approach), we revealed the correspondence between patients and lesions, enabling the participants to offer management recommendations after comparing all images from a given patient.

The Pigmented Lesions Clinic, affiliated with the Department of Dermatology, Second University of Naples, Naples, Italy, maintains a patient database that includes images from dermoscopic and clinical examinations, histopathologic results of biopsied lesions, and medical histories of all patients who have attended the clinic. From this database, we reviewed all records of patients with multiple nevi between January 1, 2004, and December 31, 2008 (451 records) and randomly selected 17 patients with high-resolution images obtained at the baseline examination and after 1 year or longer of follow-up. All patients had more than 50 nevi and at least 5 that were positive for 2 or more of the ABCD clinical features. The mean age of the patients was 32 years (age range, 14-69 years), and 10 of 17 patients were men.

All imaged lesions from the selected patients were included unless they had insufficient image quality or exceeded 15 mm in diameter. A total of 190 lesions were included, with a mean of 11 lesions (range, 5-23 lesions) per patient. Our standard practice among patients with multiple nevi is to image lesions showing clinical or dermoscopic features that are atypical enough to merit excision or follow-up. All lesions had been photographed using a digital camera (coupled with a 3Gen DermLit Foto lens; LLC, Dana Point, California), which provided contact nonpolarized high-resolution dermoscopic images. Six lesions had been excised at the baseline examination. Histopathologic examination of the excised lesions revealed 4 melanocytic nevi and 2 melanomas (1 in situ and 1 invasive with 0.3-mm thickness). The remaining 184 nevi had been monitored for a mean duration of 2.6 years (range, 1-5 years; median, 23 months); during the follow-up period, none had shown significant change (asymmetric growth of the lesion or appearance of melanoma-specific criteria) to warrant excision.

A metric to assess the performance and cost-effectiveness of melanoma screening is the number needed to excise (NNE), which reflects the total number of lesions that must be excised to find 1 melanoma. Using pooled data from each step of the study, we calculated excision recommendation rates, specificity, sensitivity, and NNE for the comparative approach (multiple lesions) and for the morphologic approach (single lesion) and compared the results of the 2 methods using χ² test. Ethics committee approval was waived.

All 6 dermoscopists were specifically trained in dermoscopy (with 5-10 years of dermoscopy experience), and none had treated any of the 17 patients. The participating dermoscopists evaluated the series of images individually, with an interval of several weeks between the 2 steps of the study. All 6 participants completed both steps of the study and provided management recommendations for each of 190 images (1140 recommendations per step). With the morphologic approach (step 1), 628 of 1140 management recommendations (55.1%) favored excision. With the comparative approach (step 2), 161 of 1140 management recommendations (14.1%) favored excision. An example of a patient’s lesions is shown in Figure 1 and Figure 2.

As summarized in the Table, excision recommendation rates of the individual participants ranged from 40.0% to 70.0% in step 1 vs 5.3% to 28.9% in step 2 (P < .001). The 2 melanomas included in the study were correctly judged to merit excision by all participants in step 1 and in step 2 (100.0% sensitivity). The overall NNE for the 6 dermoscopists was 52.3 in step 1 and 13.4 in step 2.

For 184 nevi that were not excised, 511 of 1104 management recommendations in step 1 and 979 of 1104 management recommendations in step 2 were in concordance with the actual management decisions (ie, follow-up), for overall specificities of 46.3% and 88.7%, respectively. For 4 benign nevi that were excised, the concordance between actual management and management recommendations from the study participants (ie, excision) was much higher with the morphologic approach (step 1) than with the comparative approach (step 2). Excision was favored in 23 of 24 management decisions (95.8%) in step 1 compared with 12 of 24 management decisions (50.0%) in step 2.

Figure 1. A 26-year-old man with multiple nevi. None of 11 lesions were excised at the baseline examination, and none showed substantial changes after 2 years of follow-up.
Atypical dermoscopic features are frequently found in nevi of patients with multiple lesions. Earlier studies\(^5\)-\(^9\) focused on the usefulness of digital dermoscopic follow-up to minimize the excision rate in this subset of patients. Herein, we describe an approach to the initial dermoscopic evaluation of lesions in these patients that emphasizes comparison of equivocal lesions with a patient’s other nevi.

In our study, the comparative approach dramatically reduced the number of management recommendations favoring excision. In this series, only 14.1% of lesions were judged to merit biopsy using the comparative approach compared with 55.1% using the morphologic approach, when the same lesions were judged individually without consideration of a patient’s other lesions. Assessing individual lesions in the context of a patient’s multiple nevi to find the ugly duckling is what clinicians extensively do in their routine practice.\(^4,10,11\) However, the clinical outcome of this procedure, especially in the context of dermoscopy, had been not tested to date.

One of the most useful methods to measure performance in melanoma screening is represented by the NNE, the number of melanocytic lesions needed to excise to find 1 melanoma. Reported NNEs vary according to different clinical settings and are highest in mainstream general practice (NNE range, 20-40), intermediate in skin cancer clinics run by dedicated general physicians (NNE range, 19-28), and lowest among dermatologists (NNE range, 4-18).\(^1,12\) In our study, the overall NNE for 6 dermatoscopists decreased from 52.3 using the morphologic approach (single lesion) to 13.4 using the comparative approach (multiple lesions).

Most lesions included in our study were considered benign owing to the lack of significant changes after a median follow-up of 23 months. However, 35% of melanomas excised during the follow-up period in a previous study\(^13\) showed no melanoma-specific dermoscopy features.
features after more than 8 months. In another study involving melanomas excised over time, major changes were visible after a mean follow-up of 33 months. Hence, longer follow-up of the nonexcised lesions in our study might have unveiled some early melanomas. Nevertheless, the number of these undetected melanomas would likely be small and would not affect the end point of our study.

An intrinsic limitation of this study is its virtual design. Evaluation of dermoscopic images of lesions, albeit high-quality images, may be different from real-time skin examination. The actual excision rate (3.2% of lesions) was considerably less than the rate of excision recommendations (ie, the virtual excision rate) by the study participants using the morphologic approach (55.1%) or the comparative approach (14.1%). In a real-world clinical setting, other factors may affect the management decision such as the patient’s skin type, personal or familial history of skin cancer, location and clinical features of the lesion, changes observed in the lesion, and the clinician’s experience.13

Six images in the study were of lesions that were excised. For the 2 melanomas, there was 100.0% concordance between actual management and management recommendations from the study participants: in both steps of the study, all participants recommended excision. For the remaining 4 excised nevi, there was only 50.0% concordance between actual management and management recommendations from the study participants. Melanoma-specific dermoscopic criteria are unequivocal, but there is no clear threshold for excision of nevi that fall into a morphologic “gray zone.” Few, if any, dermoscopic criteria have been described that clearly differentiate nevi to be excised from nevi to be monitored.16

Because few melanomas were included in this study, no definite conclusions can be drawn about the sensitivity of the 2 diagnostic approaches. However, our study results suggest that unnecessary excisions can be reduced by the use of a comparative approach rather than a morphologic approach in dermoscopic evaluation of equivocal lesions among individuals with multiple nevi.

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