Is Dermoscopy Useful for the Diagnosis of Melanoma?

In 1985, at the Annual Meeting of the Austrian Society of Dermatology in Vienna, when giving a lecture on dermoscopy—at that time we used the term incident light microscopy—one of us (H.P.S.) was faced immediately with 2 queries: (1) Is dermoscopy really better than naked-eye examination for the diagnosis of melanoma? (2) Will dermoscopy ever be reimbursed? To answer the second question first: yes, dermoscopy has been reimbursed in Austria since 1987. The colleague asking this question was the person who later negotiated with the Austrian Gekraftenkrankenasse and convinced them that dermoscopy should be reimbursed because it represents an innovative clinical method with benefits to individuals at risk for developing melanoma, in particular those with numerous acquired melanocytic nevi.

However, the first question—whether dermoscopy is really better than naked-eye examination for the diagnosis of melanoma—certainly has not been so easy to answer. The work of Bafounta et al1 in this issue provides the best answer up to now to this perplexing question that was asked as early as 1985. But first we will present the reasons why we are convinced that dermoscopy is useful in the diagnosis of melanoma.

Dermoscopy opens up a new dimension of clinical morphology that can easily be visualized with rather inexpensive handheld instruments commonly called dermatoscopes. Figure 1 illustrates clinical and dermoscopic images of the same melanoma in situ. Feel free to make your own judgment about whether dermoscopy reveals morphologic structures not visible with the naked eye.

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Dermoscopy forces physicians to dedicate more time and care for an individual with a pigmented skin lesion. This fact alone might be the reason why patients like dermoscopy and even ask physicians to perform this technique, at least in Europe.

Digital dermoscopy allows easy storage and retrieval of dermoscopic images and opens the door for tele-dermoscopy and computer-assisted automated diagnosis. Again, there is already a strong demand from individual patients, particularly those bearing numerous acquired melanocytic nevi, to be monitored with digital equipment.

For these reasons, dermatologists (albeit not all) and patients (basically all) love dermoscopy, despite the fact that up to now there has been no real evidence that dermoscopy is superior to naked-eye examination for the diagnosis of melanoma. We personally like dermoscopy simply because we are fascinated by the new morphologic dimensions it reveals, with all the peculiar criteria, and because of the possibility of linking dermoscopy more closely to cutaneous pathology.2 To be self-critical, the 3 points mentioned in the paragraph above have nothing in common with a scientific confirmation of the technique or with evidence-based medicine. The meta-analysis presented in this issue of the ARCHIVES is the first step toward an evidence-based approach in this field.

Bafounta et al1 report on the results of a meta-analysis using techniques adapted to the evaluation of diagnostic tests assessing the accuracy of dermoscopic diagnosis of melanoma performed by experienced observers vs naked-eye clinical examination. On the basis of 8 selected studies, representing 328 melanomas and 1865 mostly benign pigmented skin lesions, the authors conclude that, for experienced users, dermoscopy is more accurate than clinical examination in the diagnosis of pigmented skin lesions. Dermoscopy had significantly higher discriminating power than clinical examination, with estimated odds ratios of 76 vs 16, respectively, and estimated positive likelihood ratios of 9 vs 3.7, respectively. Bafounta et al1 present us with the relevance of using a statistical approach to determine positive likelihood ratios, providing additional information on the confidence clinicians may have in a test to detect a disease while taking into account the pretest probability of the disease. Figure 2 exhibits the likelihood ratio nomogram of Fagan3 that shows the association between the pretest probability, likelihood ratio, and posttest probability. As can be seen easily on this nomogram, the advantage of likelihood ratios is that the posttest probability can be assessed immediately when the pretest probability or prevalence of a given disease is known. The authors further consider other relevant criteria such as verification bias and publication bias, to name but 2. Thus, Bafounta et al are bringing evidence-based medicine into the diagnostic arena of dermatology in general and of dermoscopy in particular, and we applaud them for this.

Bafounta et al stated that all studies for their meta-analysis were conducted in clinics with expertise in pigmented skin lesions and that the place of dermoscopy in general practice remains unknown. This observation prompted us to design a clinical trial, which we will conduct via the Internet and which will be open to
all colleagues interested in participating in such an endeavor. The purpose of this trial is to have a large number of physicians, with various degrees of expertise in the field, immediately test an easily applicable, newly developed dermoscopic screening method for the early diagnosis of melanoma, the so-called 3-point checklist. The assessment of a given pigmented skin lesion, either melanocytic or nonmelanocytic, will include the dichotomous evaluation of the following 3 variables: asymmetry, atypical pigment network, and blue-white structures. The assumption that will be tested is whether a pigmented lesion should be excised immediately or at least examined in a center specializing in dermoscopy where digital documentation and monitoring will be performed, when 2 of these 3 criteria are present.

The major question in the field of dermoscopy and melanoma prevention is: Does dermoscopy have an impact on the clinical management of pigmented skin lesions? The critical issue for the patient and the physician certainly is to not misdiagnose and fail to excise a lesion that may be a melanoma, while minimizing the removal of benign lesions. We are in accordance with Bystryn\(^4\) that the development of dermoscopic procedures should focus on that goal rather than on the more difficult goal of maximizing diagnostic accuracy. In this context, a randomized, multicenter, prospective study should be performed to determine whether the adjunct of dermoscopy in the standard clinical examination is able to improve the clinical management of pigmented skin lesions. Another possibility to achieve this goal is digital dermoscopic follow-up, which is probably the most relevant and promising tool. One may suggest 2 reasons why it is necessary to examine a patient over time. First, certain patients run a high risk of developing melanoma (eg, patients with a personal or family history of melanoma, a large number of nevi, or skin phototype I or II), and these patients should be monitored periodically. Second, morphologic changes eventually occur in melanocytic nevi, and objective, long-term observation is necessary to monitor those changes.\(^5\)

Figure 1. Melanoma in situ (A, clinical view; B, dermoscopic view). This pair of images from the same melanoma in situ exhibits the additional morphologic dimension of dermoscopy.

Figure 2. Nomogram of Fagan.\(^3\) D indicates dermoscopic diagnosis; C, clinical diagnosis. The pretest probability and the positive likelihood ratios for dermoscopic and clinical diagnoses presented by Bafounta et al\(^1\) are inserted in the nomogram. Note the relevant change of the posttest probability for detecting melanoma.
In conclusion, dermoscopy opens up a new dimension of clinical morphology of pigmented skin lesions and enables the well-trained physician to improve significantly the diagnostic accuracy of pigmented skin lesions in general and melanoma in particular. Digital follow-up examinations, teledermoscopy, and computer-assisted diagnosis of pigmented skin lesions are exciting new tools that will change the current management of pigmented skin tumors. As advocates of dermoscopy, we are certainly pleased about the pioneering endeavor of Bafounta et al in presenting a meta-analysis showing that, in the hands of dermatologists with experience in dermoscopy, this technique has higher discriminatory power than naked-eye examination to detect melanoma. We probably can be confident that melanoma will have less chance to kill individuals in the 21st century.

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