Characterization of 1152 lesions excised over 10 years using total-body photography and digital dermatoscopy in the surveillance of patients at high risk for melanoma

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Background: The combined use of total-body photography and digital dermatoscopy, named "two-step method of digital follow-up," allowed the detection of incipient melanoma as a result of dermatoscopic or macroscopic changes during follow-up.

Objective: We sought to assess dermatoscopic features and dynamic changes leading to excision of melanocytic lesions during our 10-year experience of monitoring patients at high risk for melanoma.

Methods: We analyzed 1152 lesions excised during the surveillance of 618 patients at high risk for melanoma from 1999 to 2008.

Results: A total of 779 excised lesions had been previously recorded: 728 were removed because of dermatoscopic changes during follow-up and 51 were removed even though no significant change was noted. The remaining 373 excised lesions were new or undetected on previous total-body photography. A total of 98 melanomas were detected, 60 in the monitored lesions, and 38 among the "new" lesions. The most frequent dermatoscopic changes detected were asymmetric enlargement in almost 60% (n = 418), focal changes in structure in 197 (27%) and in pigmentation in 122 (17%), the latter two being more frequently seen in melanomas than in nevi (both $P < .001$). No significant differences were detected between dermatoscopic or histopathological characteristics of the melanomas in each group, with a considerable proportion of melanomas misclassified as benign in both groups (26.3% and 38.3%, respectively).

Limitations: The dermatoscopy pattern of stable lesions and the histopathology of lesions not removed were not included in the study.

Conclusion: The most frequent dermatoscopic features associated with melanoma were focal change in pigmentation or structure. Melanomas detected by dermatoscopic changes were remarkably similar to those detected in total-body photography. Almost 40% of melanomas diagnosed in individuals at high risk corresponded to lesions that were not under dermatoscopic surveillance. (J Am Acad Dermatol 2012;67:836-45.)

Key words: atypical mole syndrome; dermatoscopy; dysplastic nevus; follow-up; imaging techniques; malignant melanoma; outcome.

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Early recognition and surgical excision is the most effective intervention for improving the prognosis of patients with primary malignant melanoma (MM).[1]

To distinguish between MM and benign lesions is often a challenge for the clinician. Furthermore, overlap of clinical features may lead to overlooking MM and excising an excessive number of benign lesions.[2]

Dermatoscopy has been shown to improve the diagnostic accuracy for early melanoma detection.[3-5] Nevertheless, MM may be not only clinically but also dermatoscopically indistinguishable from melanocytic nevi, especially in incipient lesions in which specific criteria for malignancy may not be present.[6,7]

On the basis that benign lesions usually do not change whereas MMs change significantly over time, digital follow-up (DFU) of atypical melanocytic lesions that are not suspicious for MM has been proposed as a strategy to recognize MMs that may lack distinct dermatoscopic features at baseline.[8] This approach has proved to be efficient in detecting early MMs without increasing the number of unnecessary excisions.[9-11]

The use of total-body photography (TBP) has been shown to be helpful in the detection of changes in shape, color, or surface eventually occurring in any lesion, and for the identification of new lesions aided by baseline and subsequent registries.[12-16]

The combined use of TBP and digital dermatoscopy, the so-called "two-step method of digital follow-up," was designed in our unit for the surveillance of patients at high risk for MM.[17] It has been proposed as a more sensitive strategy in MM screening, by allowing not only the detection of dermatoscopic changes over time, but also detection of macroscopic changes and the occurrence of new lesions not previously registered for follow-up.[18]

In this study, we analyzed the dermatoscopic features and dynamic changes leading to excision of melanocytic lesions during our 10-year experience in the surveillance of more than 600 individuals at high risk for melanoma using two-step method of DFU. The dual strategy of the two-step method of DFU allowed us to compare excised lesions that were under previous dermatoscopic monitoring (DM) with those excised lesions that were not under DM (notDM).

CAPSULE SUMMARY

- Two-step method of digital follow-up allows not only the detection of macroscopic changes and the occurrence of new lesions not previously registered, but also the detection of dermatoscopic changes over time.
- Melanomas detected by dermatoscopic changes are remarkably similar to those detected in total-body photography in terms of histologic and dermatoscopic characteristics.
- All atypical nevi showing substantial changes over time should be excised not to miss a melanoma.

METHODS

Study population

A total of 618 patients included in the surveillance program with TBP and digital dermatoscopy at the melanoma unit of a referral academic hospital (Hospital Clinic of Barcelona) were followed up between January 1999 and December 2008.[18]

The characteristics of the population included have been detailed in Salerni et al[18] and briefly, the cohort consisted of 618 patients with a mean age of 37 years (mean SD ± 13.3 years) at time of inclusion in the program; 45.5% were men. According to inclusion criteria, the vast majority of the patients (n = 556) had atypical mole syndrome (defined as having >100 nevi and/or >10 atypical nevi under dermatoscopic or histopathological analyses); 277 had a personal history of previous melanoma, including 73 with a history of multiple primary melanomas, before the start of the study; 8 patients with giant congenital melanocytic nevus and 3 patients affected with xeroderma pigmentosum were also included. Almost one third of the patients (n = 178) had a familial history of melanoma as well. Patients were followed up for a median of 96 months (range 13-120 months).

Baseline and follow-up registries

Images were obtained using a standardized digital system (MoleMax, Derma Instruments, Vienna, Austria), which is a digital DM device with a digital video camera and software adapted for the register and comparison of macroscopic TBP and dermatoscopy images. Examination procedure was performed according to the two-step method of DFU as previously described.[17,18] Patients were scheduled for follow-up in 3, 6, or 12 months according to the judgment of the dermatoscopy specialist who performed the evaluation and depending on the degree of risk of the patient.

Abbreviations used:

DFU:	digital follow-up
DM:	dermatoscopic monitoring
MM:	malignant melanoma
notDM:	not dermatoscopic monitoring
TBP:	total-body photography