

Integrating static and dynamic features of melanoma: The DynaMel algorithm

Timo Buhl, MD,^a Christian Hansen-Hagge, MD,^a Bianca Korpas,^a Kjell M. Kaune, MD,^a Ellen Haas, MD,^a Albert Rosenberger, MD,^b Michael P. Schön, MD,^a Steffen Emmert, MD,^a and Holger A. Haenssle, MD^a
Göttingen, Germany

Background: Sequential digital dermatoscopy identifies dynamic changes in melanocytic lesions. However, no algorithm exists that systematically weights dynamic changes regarding their association with melanoma.

Objective: We sought to identify relevant dynamic changes and to integrate these into a novel diagnostic algorithm.

Methods: During follow-up (mean 44.28 months) of 688 patients at high risk, 675 pigmented lesions with prospectively documented dynamic changes were excised. The association between specific changes and melanoma was assessed.

Results: We detected 61 melanomas (38 invasive, median thickness 0.42 mm) with dynamic changes. Multivariate logistic regression analyses revealed a significant association between the diagnosis of melanoma and 5 dynamic criteria. According to the observed odds ratios we defined two dynamic major criteria (2 points each: asymmetric-multifocal enlargement and architectural change) and 3 dynamic minor criteria (1 point each: focal increase in pigmentation, focal decrease in pigmentation, and overall decrease in pigmentation when not accompanied by a lighter pigmentation of the adjacent skin). The DynaMel score was generated by addition of dynamic and 7-point checklist scores with a threshold for excision of 3 or more points. Including information about dynamic changes increased the sensitivity of the 7-point checklist from 47.5% (29 of 61 melanomas detected) to 77.1% (47 of 61 melanomas detected). The specificity slightly decreased from 99.0% to 98.1%.

Limitations: Before broad application the DynaMel algorithm needs to be validated using data from a different prospective study.

Conclusions: The DynaMel algorithm integrates a scoring system for dynamic dermatoscopic changes into the 7-point checklist for dermatoscopy and thereby increased the sensitivity of melanoma detection. (J Am Acad Dermatol 2012;66:27-36.)

Key words: digital dermatoscopy; DynaMel; dynamic changes; melanoma; nevi.

Unless recognized and excised early, cutaneous melanoma is a life-threatening disease.¹ During the past decade several dermatoscopic algorithms have been proposed to ensure accurate diagnosis of melanocytic lesions.²⁻⁹ Among

Abbreviations used:

CI: confidence interval
OR: odds ratio
ROC: receiver operating characteristic

From the Departments of Dermatology^a and Genetic Epidemiology,^b Georg August University Göttingen.

The first two authors contributed equally to this work.

Supported in part by the Niedersächsische Krebsgesellschaft e.V., Hannover, Germany. The FotoFinder dermoscope used in this study is a donation of Teachscreen Software GmbH (Bad Birnbach, Germany) to the University Hospital Göttingen.

Conflicts of interest: None declared.

Accepted for publication September 23, 2010.

Reprint requests: Holger A. Haenssle, MD, Department of Dermatology, Venereology, and Allergology, Georg August University Göttingen, Von Siebold Strasse 3, D 37075 Göttingen, Germany. E-mail: h.haenssle@med.uni-goettingen.de.

Published online June 9, 2011.

0190-9622/\$36.00

© 2010 by the American Academy of Dermatology, Inc.

doi:10.1016/j.jaad.2010.09.731

other algorithms, the 7-point checklist was described as a valid and reliable method to distinguish benign and malignant melanocytic lesions.^{2,10,11} This checklist was developed as a quantitative scoring system with 3 major criteria and 4 minor criteria. A minimum total score of 3 is required for the diagnosis of melanoma.^{2,12} The 7-point checklist can be learned and applied easily and allows the best sensitivity in the hands of nonexperts.^{13,14} However, very early¹⁵ or advanced¹⁶ melanomas may lack distinct dermatoscopic features. In this light, the integration of additional information derived from the longitudinal observation of dynamic changes may uncover melanomas that are otherwise missed, thereby further increasing the sensitivity of early melanoma detection.¹⁷⁻²⁰ Two strategies of sequential dermatoscopic follow-up might be used: (1) short-term follow-up (3-month interval), which targets a restricted number of highly atypical nevi²¹; or (2) long-term follow-up (6- to 12-month intervals), which aims at an optimized surveillance of patients at high risk and includes a higher number of atypical nevi into sequential dermatoscopic analysis.^{17,18,22}

Although initial studies tended to excise melanocytic lesions with any dynamic changes, a more recent trial differentiated substantial (eg, asymmetric enlargement) versus nonsubstantial (eg, appearance/disappearance of inflammatory reactions) long-term modifications of melanocytic lesions.¹⁵ Conclusions from this trial were limited by the fact that lesions with defined nonsubstantial changes were not excised and further follow-up was not reported.

To our knowledge no scoring algorithm for the systematic assessment of dynamic changes has been reported until today. The aim of the current study was to develop such a scoring system based on the analysis of data from a prospective observational trial using long-term follow-up by sequential digital dermatoscopy.

METHODS

Patients' examination

All clinical investigations were conducted according to the Declaration of Helsinki. Written informed patient consent was obtained for invasive procedures.

Data of 688 patients with at least one follow-up examination were collected during a period of 10 years (123 months; December 1, 1998, to February 28, 2008).

At the first visit patients received an examination of the entire skin by the unaided eye and a handheld dermatoscope (EpiScope, ×10 magnification,

contact plate, Welch Allyn, Skaneateles Falls, NY). A standardized dermatoscopic algorithm for differentiation of melanocytic from nonmelanocytic lesions was used.²³ The 7-point checklist algorithm was used for differentiating benign melanocytic lesions from melanoma.² Lesions scoring less than 3 points but presenting defined clinical or dermatoscopic criteria of atypia (eg, asymmetry in shape, irregular margin)²⁴ were marked on digital overview images and electronically stored (FotoFinder dermoscope, Teachsreen Software

GmbH, Bad Birnbach, Germany; or Hikoscopes, Hiko, Pirmasens, Germany). Lesions suggestive of malignancy by this algorithm (score ≥ 3 points) were digitally stored and immediately excised.

At follow-up visits (mean interval 11.7 months) patients were asked about new or changing nevi and digital overview images were compared with the corresponding body surface. Nevi that had been digitally documented during a previous visit (n = 11,137) were again digitally stored, scored by the 7-point checklist, and then compared with the baseline image on a split screen.

All examination procedures were performed by dermatology residents who were formally trained in dermatoscopy and supervised by board-certified dermatologists who were experts in the field of dermatoscopy.

Excisional biopsies

Biopsy specimens of 675 consecutive lesions showing dynamic changes were taken from 248 patients and included in the study. We defined and prospectively documented a number of dynamic changes that triggered an excisional biopsy. Enlargement was defined as being symmetric (with or without evenly distributed globules at the periphery), asymmetric-focal (enlargement of only one segment at the periphery), or asymmetric-multifocal

CAPSULE SUMMARY

- No diagnostic algorithm exists that systematically weights dermatoscopic changes in melanocytic lesions for their association with melanoma.
- We identified dynamic changes that are relevant for the diagnosis of melanoma and integrated these into a novel scoring algorithm (DynaMel algorithm).
- The DynaMel algorithm represents a dermatoscopic algorithm applicable for daily clinical use that integrates static and dynamic features of melanoma and thereby increases the sensitivity of melanoma detection.

Download English Version:

<https://daneshyari.com/en/article/3207252>

Download Persian Version:

<https://daneshyari.com/article/3207252>

[Daneshyari.com](https://daneshyari.com)