ORIGINAL ARTICLE

Accuracy of dermatoscopy for the diagnosis of nonpigmented cancers of the skin

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Background: Nonpigmented skin cancer is common, and diagnosis with the unaided eye is error prone.

Objective: To investigate whether dermatoscopy improves the diagnostic accuracy for nonpigmented (amelanotic) cutaneous neoplasms.

Methods: We collected a sample of 2072 benign and malignant neoplastic lesions and inflammatory conditions and presented close-up images taken with and without dermatoscopy to 95 examiners with different levels of experience.

Results: The area under the curve was significantly higher with than without dermatoscopy (0.68 vs 0.64, $P < .001$). Among 51 possible diagnoses, the correct diagnosis was selected in 33.1% of cases with and 26.4% of cases without dermatoscopy ($P < .001$). For experts, the frequencies of correct specific diagnoses of a malignant lesion improved from 40.2% without to 51.3% with dermatoscopy. For all malignant neoplasms combined, the frequencies of appropriate management strategies increased from 78.1% without to 82.5% with dermatoscopy.

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Limitations: The study deviated from a real-life clinical setting and was potentially affected by verification and selection bias.

Conclusions: Dermatoscopy improves the diagnosis and management of nonpigmented skin cancer and should be used as an adjunct to examination with the unaided eye. (J Am Acad Dermatol http://dx.doi.org/10.1016/j.jaad.2017.07.022.)

Key words: dermatoscopy; dermoscopy; diagnosis; keratinocytic skin cancer; melanoma; nonpigmented skin cancer.

CAPSULE SUMMARY

- The diagnosis of nonpigmented skin cancers with the unaided eye is error prone.
- Dermatoscopy improves the detection of nonpigmented skin cancer and increases the frequencies of correct diagnoses and appropriate treatments.
- Dermatoscopy should be used for nonpigmented single lesions, especially if a malignant neoplasm is in the differential diagnosis.

Dermatoscopy (dermoscopy or epiluminescence microscopy) is a noninvasive diagnostic technique that is widely used to examine pigmented skin lesions in vivo.[1,2] In comparison to examination with the unaided eye, dermatoscopy improves the sensitivity for melanoma by 25% and the accuracy for pigmented nonmelanocytic neoplasms by nearly 10%.[3-5] Most cutaneous neoplasms, however, are nonpigmented (amelanotic); they include common cutaneous malignancies such as basal cell and squamous cell carcinomas but also rare malignant neoplasms such as adnexal and vascular neoplasms, cutaneous lymphomas, Merkel cell carcinoma, and amelanotic melanoma.[6-20] On the other hand, there are a large variety of nonpigmented benign conditions that may mimic skin cancer, ranging from benign neoplastic to inflammatory conditions.[21-30]

The wide range of differential diagnoses, the lack of pigment, and the paucity of specific dermatoscopic structures make the diagnosis of amelanotic neoplasms more challenging than that of pigmented lesions.[31,32] Although dermatoscopic criteria have been described for different types of nonpigmented skin lesions (including neoplastic and inflammatory diseases), it is unclear whether dermatoscopy improves the diagnosis of nonpigmented lesions in the same way that it improves the diagnosis of pigmented lesions. We therefore collected a large number of nonpigmented skin lesions, including benign and malignant neoplastic lesions and inflammatory conditions, and initiated a web-based study to compare diagnostic accuracies and management decisions with and without dermatoscopy.

METHODS

The basic sample included 2392 nonpigmented (amelanotic) skin lesions that were consecutively excised between July 2007 and January 2015, either in a primary skin cancer clinic in Queensland, Australia, or at the Department of Dermatology of the Medical University of Vienna, Austria. The inclusion criteria were lack of pigmentation in the clinical image, availability of close-up images taken with and without dermatoscopy, and availability of an unequivocal histopathologic report. After exclusion of mucosal lesions and cases with inaccurate or incomplete documentation (out-of-focus images, missing images, lesions extending beyond the borders of the image, incomplete data, or missing histopathologic report), the basic sample consisted of 1980 cases. To increase the number of rare neoplasms, we included 92 additional cases (34 amelanotic melanomas, 9 rare malignant neoplasms other than melanoma, and 49 rare benign neoplasms) from dermatologists located in Sweden, Italy, Austria, France, Turkey, and Germany. The final sample included 2072 cases from 1090 patients (45.3% female patients with a mean age of 64 years [range, 11-94 years]) and consisted of 1476 malignant (71.2%) and 596 benign (28.8%) skin lesions. Most lesions occurred on the head and neck (32.7%), followed by the trunk (23.5%), the lower extremities (22.6%), and the upper extremities (21.2%). The diagnoses were grouped into six blocks: (1) melanoma and melanoma metastases, (2) malignant keratinocytic proliferations, (3) benign keratinocytic neoplasms, (4) inflammatory and infectious diseases, (5) other malignant neoplasms, and (6) other benign conditions (Fig 1). For purpose of the study, we determined in advance that actinic keratoses, intraepithelial carcinomas (Bowen disease), and keratoacanthomas belong to the group of malignant keratinocytic neoplasms. Twenty-nine melanomas