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Clinical Diagnosis of Melanoma

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Clinical Question

How accurate are clinical examination and dermoscopy findings in the diagnosis of melanoma?

Evidence Summary

The incidence of melanoma is increasing in the United States. Although there is insufficient evidence to recommend routine screening for skin cancer,[1] physicians and patients are encouraged to be vigilant for suspicious skin lesions.[2] The classic mnemonic for the clinical diagnosis of melanoma is the ABCD criteria (asymmetry in two or more axes, irregular border, two or more colors, diameter). Although the criterion for diameter was originally greater than 6 mm, the best study on the accuracy of the ABCD criteria uses 6 mm or greater.[3,4]

Some researchers have extended the ABCD criteria into the ABCDE criteria by adding enlargement, elevation, or evolution (i.e., enlargement, changes in thickness, and bleeding) as a criterion.[4] The best study of the accuracy of the ABCDE rule included 460 unselected, consecutive patients with melanoma and 680 patients with other pigmented lesions.[4] The study used a cutoff of 6 mm or greater for diameter; determined enlargement as described by the patient; and blinded the histopathology, which served as a reference standard (all patients were biopsied). The authors of the study reported on accuracy when more than one finding was abnormal. The most important finding was enlargement (positive likelihood ratio [LR+] = 8.4).[4]

Another clinical finding associated with melanoma is the "ugly duckling sign", also called outliers. This refers to a mole that differs significantly in appearance from other moles on the patient; such moles are more likely to be a melanoma. In a prospective study using unaided and dermoscopic images, the ugly duckling sign was more sensitive when defined as any lesion perceived as different from other moles. It was more specific when defined as any lesion perceived as completely different.[5]

Dermoscopy is an office technique in which a magnifier is placed on skin that is covered with liquid. By using cross-polarized light, it is possible to see structures in the epidermis and superficial dermis that are not visible to the naked eye, thus allowing for better recognition of the ABCD signs of melanoma.

There have been three meta-analyses of dermoscopy.[6–8] A 2001 meta-analysis identified eight studies comparing dermoscopy with unaided clinical diagnosis using the naked eye.[6] In all eight studies, dermatologists were blinded to the final diagnosis and there was an adequate spectrum of pigmented lesions. Dermoscopy was generally more accurate than unaided examination (LR+ = 9.0 versus 3.7; negative likelihood ratio [LR–] = 0.11 versus 0.27).

A 2002 meta-analysis did a more thorough search of the literature and identified 27 studies.[7] Fourteen of these studies compared dermoscopy with clinical diagnosis, including several in which dermoscopy was performed by nonexperts. Accuracy data (presented as log odds ratios and the area under the receiver operating characteristic curve) showed that dermoscopy was more accurate than unaided clinical diagnosis when performed by experts, but not by nonexperts.

The most recent meta-analysis, which was conducted in 2008, limited the analysis to high-quality studies comparing dermoscopy with unaided clinical examination.[8] These studies included prospectively enrolled, consecutive patients in the clinical setting, were blinded and independent, and used a valid reference standard. The nine studies, with 8,487 skin lesions, that were included in the analysis showed that sensitivity was higher for dermoscopy than for clinical examination (87 versus 69 percent after removing two outlier studies). However, specificity was similar between the two examinations (91 and 88 percent, respectively). Thus, although dermoscopy improves the sensitivity of diagnosis, it requires adequate exam iner training.

Table 1 includes accuracy data for the ABCDE rule, the ugly duckling sign, and dermoscopy.[2,4,5,8–11] Whenever the patient physician is concerned about a skin lesion, regardless of ABCDE or dermoscopy findings, a biopsy is strongly recommended Even pigmented lesions that only meet one of the ABCDE criteria are sometimes malignant, particularly if they are very different from other moles or if they are enlarging evolving. If the patient declines biopsy, the physician should photograph the lesion and have the patient return for a follow-up after a defined period, such as one month.

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Table 1.

Accuracy of Diagnostic Techniques for Melanoma

TECHNIQUE	LR+	LR–	PROBABILITY OF MELANOMA GIVEN A 5% PRETEST PROBABILITY (%)*	
			POSITIVE TEST RESULT	NEGATIVE TEST RESULT
ABCDE criteria[4]				
Asymmetry	2.0	0.60	9.7	3.0

Border (irregular)	2.0	0.61	9.4	3.1
Color (two or more colors)†	1.6	0.59	7.7	3.0
Diameter (6 mm or greater)	2.4	0.16	11.3	0.8
Enlargement (by patient description)	8.4	0.18	30.7	0.9
At least 1 abnormal finding	1.5	0.08	7.4	0.4
At least 2 abnormal findings	2.6	0.16	11.9	0.9
At least 3 abnormal findings	3.3	0.43	14.7	2.2
At least 4 abnormal findings	8.3	0.49	30.4	2.5
At least 5 abnormal findings	107	0.57	85.0	2.9
"Ugly duckling sign" (outliers)[5]				
Any mole perceived as different from other moles	6	0.13	25.1	0.7
Only those moles perceived as completely different	17	0.33	47.2	1.7
Dermoscopy (abnormal)‡[8]	10	0.14	33.7	0.7

ABCDE = asymmetry in two or more axes, irregular border, two or more colors, diameter, enlargement; LR– = negative likelihood ratio; LR+ = positive likelihood ratio.

—Pretest probability is an estimate based on a large series of patients with pigmented lesions suspicious enough to undergo biopsy.[9]

†— Does not include symmetrical darkening of the center of the lesion.

‡— Criteria used for abnormal dermoscopy finding included the ABCD criteria, Menzies method,[10] and seven-point checklist.[11]

Information from references 2, 4, 5, and 8 through 11.

Applying the Evidence

A patient presents with a symmetrical lesion that has a regular border, has a blue-black coloration, and is 7 mm in diameter. The patient believes that the lesion has enlarged in the past three months. There are few other moles on the patient, and no ugly duckling sign. How do you advise the patient?

Answer: The patient has three abnormal findings using the ABCDE criteria (color, diameter, enlargement). Given a 5 percent pretest probability, her likelihood of melanoma is approximately 15 percent. You recommend a biopsy.

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