

Routine Dermatologist-Performed Full-Body Skin Examination and Early Melanoma Detection

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Objective: To determine the proportion of patients in a private dermatology practice in whom melanoma was detected but was not the presenting complaint.

Design: Retrospective analytical case series.

Setting: Private dermatology practice in Florida, from July 2005 through October 2008.

Patients: Patients with 126 melanomas, of which 51 were invasive and 75 were melanomas in situ.

Main Outcome Measures: Proportion of melanomas detected as a result of patient complaint vs proportion determined by dermatologist-conducted full-body skin examination (FBSE). As a secondary analysis, we used logistic regression odds ratios (ORs) of association to examine whether dermatologist detection rather than patient complaint was associated with detecting thinner melanomas. A post hoc analysis was performed using a thickness cutoff of 1.0 mm to define a deep melanoma.

Results: Overall, 56.3% (95% confidence interval [CI], 47.6%-65.1%) of melanomas were found by the dermatologist and were not part of the presenting complaint. Of melanomas in situ, 60.0% (95% CI, 48.7%-71.3%) were dermatologist detected. Dermatologist detection was significantly associated with thinner melanomas, with an OR of 0.42 ($P=.04$). We found a significant association between thinner melanomas as a group (thickness <1 mm) and dermatologist detection, with a logistic regression OR of 5.0 (95% CI, 1.0-25.3).

Conclusions: Most melanomas detected in a general-practice dermatology setting were found as a result of dermatologist-initiated FBSE, not patient complaint. We found that dermatologist detection was associated with thinner melanomas and an increasing likelihood of the melanoma being in situ.

Arch Dermatol. 2009;145(8):873-876

EARLY MELANOMA DETECTION is the cornerstone of effective treatment, but guidelines remain sparse regarding appropriate screening procedures for both the general population as well as high-risk patients.¹⁻⁵ Despite an estimated 62 480 new cases of melanoma in the United States in 2008 alone,⁶ a 2-year-old call for increased action on melanoma screening and awareness remains largely unheeded.⁷

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In clinical practice, many patients present with focused complaints and may not request a full-body skin examination (FBSE). One study⁸ has suggested that 30% of dermatologists perform FBSEs on all patients and that 49% examine all patients felt to be at increased risk.

While it is known that screening identifies melanomas at an earlier stage than

would be found otherwise^{9,10} and that physicians detect melanomas with less tumor thickness,^{11,12} the US Preventive Service Task Force¹ states that current evidence is insufficient to recommend for or against routine screening. The population seen in skin cancer screenings differs markedly from that seen in a dermatology practice with a high-risk patient population.¹³⁻¹⁵

Our aim was to determine the proportion of patients in a private dermatology practice in whom melanoma was detected but was not the presenting complaint. If a substantial proportion of melanomas are detected only after a dermatologist's examination, this may suggest that FBSE, and not simply a problem-focused approach, should at least be considered for selected patients.

METHODS

A retrospective analytical case series was conducted over a 3-year period. All patients seen by one of the authors (J.K.) and diag-

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Table. Baseline Patient Characteristics^a

Characteristic	Overall (N=126)	Group	
		With Patient-Detected Melanoma (n=55)	With Dermatologist-Detected Melanoma (n=71)
Age, mean, y	59.9 (57.3-62.5)	57.5 (53.3-61.7)	61.8 (58.5-65.1)
Male sex	61.1 (52.5-69.7)	58.2 (44.7-71.6)	63.4 (51.9-74.9)
Depth, mm	0.27 (0.17-0.37)	0.40 (0.19-0.62)	0.16 (0.09-0.24)
Clark level, mean	0.75 (0.52-0.98)	0.94 (0.56-1.32)	0.61 (0.32-0.89)
History of melanoma	13.5 (7.4-19.5)	18.2 (7.7-28.7)	9.9 (2.8-17.0)
History of nonmelanoma skin cancer	35.7 (27.2-44.2)	25.5 (13.6-37.3)	43.7 (31.8-55.5)
Family history of melanoma	14.3 (8.1-20.5)	16.4 (6.3-26.5)	12.7 (4.7-20.6)

^aData are presented as percentages (95% confidence intervals) except where noted.

nosed as having melanoma or melanoma in situ were included in the study. The primary study question was what proportion of melanomas ultimately diagnosed by the dermatologist was not part of the patient's presenting complaint and thus may not have been detected without a FBSE. This was calculated using the simple proportion of patients whose melanomas were self-detected and presented with 95% confidence intervals (CIs).

As a secondary analysis, we used logistic regression odds ratios (ORs) of association to examine whether dermatologist detection rather than patient complaint was associated with detecting thinner melanomas. A post hoc analysis was performed using a thickness cutoff of 1.0 mm to define a deep melanoma.

Only patients with biopsy-proven invasive melanoma or melanoma in situ were included in this study. Melanomas detected as a result of any nondermatologist actions (eg, brought to the patient's attention by their spouse, friend, or primary care physician) were classified as patient detected. If a patient requested an FBSE without noting a particular lesion, or if they were referred for a different lesion than the melanoma, the melanoma would be classified as physician detected. Institutional review board review and exempted approval were obtained for this study. Statistical analyses were conducted using Stata for Windows XP (version 10.0; Stata Corp, College Station, Texas).

RESULTS

Of the 126 cases of melanoma, 75 were in situ and 51 represented invasive melanoma. Melanoma depth ranged from 0 (in situ) to 4.0 mm. The mean melanoma depth, including in situ lesions, was 0.27 mm (95% CI, 0.17-0.37), and the mean depth including only invasive melanomas was 0.67 mm (95% CI, 0.45-0.88). The median (SD) depth for invasive melanomas was 0.40 (0.76) mm. The mean patient age was 60 years (range, 15-92 years), and 61% of the patients were male. Overall, a total of 56.3% (95% CI, 47.6%-65.1%) of melanomas were found by the dermatologist and were not part of the presenting complaint. Of melanomas in situ, 60.0% (95% CI, 48.7%-71.3%) were dermatologist detected. Conversely, 43.7% (95% CI, 34.9%-52.4%) of melanomas were found as a result of being part of the chief complaint. Baseline patient characteristics (**Table**) did not differ significantly based on whether melanoma was found as a result of the presenting complaint.

A greater proportion of melanomas in the physician-detected group (mean, 63.4%; 95% CI, 51.9%-74.9%) than in the patient-detected group (mean, 54.5%; 95% CI, 41.0%-68.1%) were in situ. Including only invasive melanomas, the median (SD) melanoma depth for the physician-detected group was 0.33 (0.41) mm, and for the patient-detected group the median depth was 0.55 (0.96) mm.

We found a statistically significant association between increasing melanoma depth and patient detection. The univariate OR of association between a patient-noted melanoma and increasing depth was 2.39 ($P=.04$). Conversely, dermatologist detection was significantly associated with thinner melanomas, with an OR of 0.42 ($P=.04$). Univariate logistic regression ORs failed to demonstrate an association between other baseline characteristics such as patient sex or age and melanoma depth. A post hoc analysis was performed using a cutoff of 1.0 mm for classification of deep melanomas, a cutoff used in other melanoma studies in the past.¹⁶ We found a significant association between thinner melanomas as a group (thickness <1 mm) and dermatologist detection, with a logistic regression OR of 5.0 (95% CI, 1.0-25.3).

COMMENT

The incidence of malignant melanoma is rising in the United States and worldwide, and investigators continue to struggle with understanding both the etiology of this trend and its clinical significance. It remains unclear whether this increase may be related to detection bias, other factors such as increased UV exposure, or other, as-yet unelucidated causes.^{17,18}

Data on melanoma detection among patients in whom the pigmented lesion was not the primary complaint may help to promote education and encourage future patients to avail themselves of FBSE. In addition, there are no uniform recommendations on FBSEs by clinicians, and those few studies that have addressed this issue tend to focus on either detection by primary care physicians,¹⁹⁻²¹ detection in tertiary referral centers,^{12,22} or detection in a screening setting.^{4,23} As highlighted in an editorial by Geller et al,⁷ randomized controlled trials of

melanoma screening in a high-risk population will likely never be completed, and holding out for this level of evidence may be both intellectually naïve and ethically misguided.

Most melanomas detected in a general-practice dermatology setting were found as a result of a dermatologist-initiated FBSE. Melanomas that were found as a result of cutaneous examination represent 56.3% of the total number of melanomas found over a 3-year period. Fully 60% of melanomas in situ were detected at this early stage owing to dermatologist-prompted examination. Moreover, we found that dermatologist detection was associated with thinner melanomas and an increasing likelihood of the melanoma being in situ. We also demonstrated a clinically significant association between thinner melanomas as a group (<1 mm) and dermatologist detection. These findings have obvious and important implications for clinical practice.

These data suggest that minimizing the substantial public health and financial impact of melanoma may be aided by an FBSE. While self-examination plays a critical role in early detection, prior studies^{12,16,24} have suggested that physicians, and dermatologists in particular, may be better able to detect melanomas with lesser tumor thickness. Because increasing tumor thickness is closely correlated with decreasing survival, it follows that complete examination plays an important role, particularly in high-risk populations.²⁵

Prior studies in tertiary referral centers found a lower proportion of melanomas detected by the physicians, ranging from 14% of melanomas that were physician detected in a University of Michigan study¹¹ to 16% at Memorial Sloan-Kettering Cancer Center,²² and 24% at Johns Hopkins University.¹² A population-based study from Queensland, Australia, found that 25% of melanomas were physician detected,¹⁹ and an Italian study found 34% of melanomas to be physician detected.²⁶

This study has several limitations. The population included in this study may not be generalizable to the general population, and therefore far-reaching conclusions regarding the broad value of melanoma screening should be avoided. Moreover, this population also may not be generalizable to high-risk populations seen in other communities. Finally, the rate of melanoma detection by the dermatologist in this study (J.K.) may not be generalizable to other practicing dermatologists.

Other limitations of this study include its limited sample size as well as its retrospective nature, but again, our goal was not to determine the true proportion of melanomas detected by dermatologists but to establish whether this represents a clinically significant number and, if so, to advocate for further research in this important area. Subtle population differences, both in terms of baseline melanoma incidence as well as self-detection patterns and practices, may substantially alter the background proportion of melanomas that are detected by the dermatologist. What is important, however, is that a large percentage—more than half in our study—of melanomas may not have been detected in the absence of a dermatologist-conducted FBSE.

Melanoma is one of the few cancers affecting young adults and will be responsible for some 8420 deaths in the United States in 2008 alone.^{6,27} Any intervention that has the potential to mitigate this toll merits at least detailed consideration, especially if associated with only minimal cost and inconvenience. Recently, a randomized controlled trial²⁸ (RCT) was performed to assess the effectiveness of an education program for patient self-examination in siblings of patients with melanoma, and there has been an increasing push to screen for melanoma on a national basis.⁷

Early melanoma detection may be accomplished either by patient self-detection or by physician examination.²⁹⁻³¹ Encouraging patients to perform self-examinations, while practiced widely, has yielded mixed results. The Check It Out trial,³² which included motivated subjects actively part of an RCT, demonstrated only a 55% self-examination rate at 12 months.

Dermatologists frequently detect melanomas, but the proportion of melanomas that are dermatologist detected, rather than patient self-detected, remains unknown. If a substantial proportion of melanomas are detected by dermatologists, this would argue for the wider adoption of FBSEs by dermatologists even in patients who do not request an FBSE.

To our knowledge, this is the first study to examine the proportion of melanomas detected by a private-practice dermatologist and not noted by the patient. Because both referral patterns, as well as baseline melanoma risk, differ markedly in the United States, Australia, and Europe, these data will hopefully be more generalizable to the American population. These data are also more generalizable than those derived from a referral center. Moreover, future cost-effectiveness studies could hopefully take some of our data into account to develop a more robust model. Although the cost-effectiveness of melanoma screening has been evaluated in the past, the models' findings were sensitive to a number of factors, thus limiting their broad applicability.^{33,34} Finally, as noted herein, most screening programs focus on the general population or primary care population rather than on the population seen in dermatologists' offices, which may have dramatic effects on the cost-effectiveness estimates' usefulness.

The value of dermatologist detection is bolstered by our findings that not only are most melanomas found by the physician but that dermatologist detection has a statistically significant association with the detection of thinner melanomas. This supports both the internal and external validity of our results. Thus, FBSEs confer both an absolute benefit (detecting most melanomas) as well as a clinically significant marginal benefit (detecting melanomas with less tumor thickness). We hope that these findings will help spur large population-based studies in high-risk populations to develop an evidence-based approach to determining appropriate screening practices and intervals. Although the most recent update from the US Preventive Service Task Force again found the evidence insufficient to recommend for or against routine melanoma screening,¹ this recommendation applies to screening by primary care physicians, not examination

of high-risk patients by dermatologists. Further research in this area, and in the cost-effectiveness of screening, may lead to important changes in practice that could potentially reduce melanoma mortality and improve patient outcomes.

Accepted for Publication: February 26, 2009.

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Author Contributions: Both authors had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* J. Kantor and D.E. Kantor. *Acquisition of data:* J. Kantor. *Analysis and interpretation of data:* J. Kantor and D.E. Kantor. *Drafting of the manuscript:* J. Kantor. *Critical revision of the manuscript for important intellectual content:* J. Kantor and D.E. Kantor. *Statistical analysis:* J. Kantor. *Administrative, technical, and material support:* J. Kantor and D.E. Kantor.

Financial Disclosure: None reported.

Previous Presentation: An earlier version of these data was presented at the American Society for Dermatologic Surgery Annual Meeting; October 12, 2007; Chicago, Illinois.

Additional Contributions: Tiffany White, ST, and Melissa Khaophachanh, MA, assisted with data collection and abstraction and Lisa Thomas, CCRC, provided regulatory assistance.

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