

Skin Melanomas Excised by General Practitioners: More Often Unsuspected, of Nodular Type and Less of Often Radically Excised Than Those Excised in an Academic Setting

Pieter AJ Buis¹, Folkert J van Kemenade², Bernard D Frijling³ and Paulus Joannes van Diest^{4*}

¹General Practice H. de Manstraat, Harderwijk, Netherlands

²Department of Pathology, VU University Medical Center, Amsterdam, Netherlands

³Diagnostic Centre Saltro, Utrecht, Netherlands

⁴University Medical Center Utrecht, Utrecht, Netherlands

Background

In The Netherlands, the incidence of cutaneous melanoma is about 3000 per year in a population of about 16 million. It is expected that by 2015, the incidence of melanoma in The Netherlands will have increased by 99% compared to 2005 [1]. Since the prognosis of melanoma is strictly related to Breslow thickness with a five years survival of 85-98% in case of a thickness <0.75 mm 95-98% compared to 45% for thickness >1.5 mm, detection and primary radical removal in the earliest possible stage is essential.

Since the majority of pigmented skin lesions presents at the GP, adequate clinical diagnosis by GPs is crucial. GPs can then do a narrow excision in the majority of patients with smaller lesions with a low index of suspicion in uncomplicated body areas, while referring patients with high index of suspicion lesions to a dermatologist or surgeon, as well as refer those that provide technical problems because of bigger size or the anatomic location.

Melanomas usually present as an irregular pigmented lesion of varying size, but presentation may be atypical. Based on clinical assessment, the general practitioner (GP) decides to reassure the patient, excise the lesion himself or refer the patient to a hospital. The latter will especially occur in case of a high index of suspicion, but also for larger lesions and lesions on body parts that will cause technical or cosmetic problems for the GP such as hands, feet or face. However, previous studies have shown that clinical diagnosis of pigmented skin lesions by GPs is not very accurate [2-7]. Our own studies [3,4] showed that 1.9% of pigmented skin lesions submitted for histopathology bared a (pre) malignancy, 62% of the malignancies being an unsuspected melanoma. Although it has not convincingly been proven that (incisional) biopsies of melanomas worsen prognosis [8], best practice for a GP is yet to radically excise suspicious lesions whenever possible or refer to a dermatologist or surgeon. Therefore, proper assessment of the index of suspicion by GPs would result in optimal care for patients with pigmented lesions: primary excision followed by sentinel node biopsy if indicated for patients with a high index of suspicion by dedicated specialists (surgeons or dermatologists), and narrow excision with good cosmetic outcome by GPs of lesions with a low index of suspicion.

We undertook the present study where we compared melanomas excised by GPs with those excised by dermatologists and surgeons in an academic practice to identify several differences between the two groups of melanomas that may be translated into better clinical practice of GPs.

Methods

The Pathology database of the Saltro, a general practitioner's diagnostic centre in the Utrecht region, The Netherlands, was retrospectively searched for skin excisions with the diagnosis "melanoma" in the years 1995-2006. During these years, dermatoscopy

was not yet applied. These diagnoses had been made at the Department of Pathology of the VU University Medical Center in Amsterdam. This yielded 188 cases of "GP melanomas". For each patient, sex, clinical diagnosis, melanoma type, Clark level, Breslow thickness, and radicality of the excision were noted. From the pathology database of the Department of Pathology of the University Medical Center Utrecht, the first 10 primary skin "academic" melanomas were selected from each year within the same period, resulting in 120 cases. Five cases appeared to be referrals, leaving 115 representative "academic" melanoma cases.

Differences between the GP and academic melanomas were analyzed by t-test for continuous and chi-square statistics for discrete individual features. Logistic regression analysis was performed to identify independent discriminative features. All statistics were done with SPSS (version 15.0).

Results

Table 1 shows the results of the comparison of clinicopathologic features between GP and academic skin melanomas. Melanomas excised by GPs were significantly more often located on trunk and extremities ($p < 0.0001$) while academic melanomas were more frequently located in the head&neck, hand/feet and face regions. Further, the GP melanoma cases concerned significantly more often females ($p = 0.006$). Also the melanoma subtype differed: GP melanomas were more frequently of nodular type ($p < 0.0001$). Moreover, Clark level III occurred more frequently in GP melanomas ($p < 0.0001$). Lastly, melanomas excised by GPs were significantly less often radically removed ($p < 0.0001$). Age and Breslow thickness were not significantly different. In logistic regression, localization, melanoma subtype and sex emerged as independent discriminative variables. In the subgroup of cases without the clinical diagnosis melanoma (85.5%), similar trends were seen (data not shown).

Clinical diagnosis of melanoma was most often nevocellular nevus by GP (63.5%) and melanoma by the academics (45.2%) ($p < 0.0001$). Only 14.4% of GP melanomas were clinically suspected while 45% of academic melanomas were clinically suspected to be one ($p < 0.0001$).

*Corresponding author: Paulus Joannes van Diest, University Medical Center Utrecht, Utrecht, Netherlands, E-mail: p.j.vandiest@umcutrecht.nl

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		GP melanomas N = 188	Academic melanomas N = 115	p-value
Age	Mean in years (range)	47 (7-94)	51 (10-93)	0.060*
Sex	Male	68 (36%)	60 (52%)	0.004
	Female	120 (64%)	55 (48%)	
Clinical diagnosis	Nevocellular nevus	119 (63.5%)	44 (38.3%)	< 0.0001
	Fibroma	10 (5.3%)	1 (0.9)	
	Wart	4 (2.1%)	0 (0%)	
	Seborrheic keratosis	7 (3.7%)	4 (3.5)	
	Melanoma	27 (14.4%)	52 (45.2%)	
	No diagnosis	12 (6.4%)	13 (11.3%)	
Localisation	Head/neck	2 (1.1%)	8 (7.0%)	<0.0001
	Extremities	108 (57.1%)	46 (40.4)	
	Trunk	69 (36.5%)	44 (38.6%)	
	Hand/feet	5 (2.6%)	6 (5.3%)	
	Face	1 (0.5%)	10 (8.8%)	
	In situ	9 (4.8%)	2 (1.7%)	
Type	Superficial spreading	126 (67%)	84 (73%)	
	Nodular	51 (27%)	15 (13%)	
	Lentigo malignant	0	8 (7.0%)	
	Acrolentiginous	0	3 (2.6%)	
	Spindle cell	1 (0.5%)	2 (1.7%)	
Breslow	Mean in mm (range)	1.51 (0-6.9)	1.80 (0-10)	0.196*
Clark level	I	12 (6.3%)	8 (7.0%)	<0.0001
	II	58 (30.7%)	34 (29.6%)	
	III	94 (49.7%)	27 (23.5%)	
	IV	24 (12.7%)	43 (37.4%)	
	V	1 (0.5%)	3 (2.6%)	
Radical excision	Yes	101 (56.7%)	89 (87.3%)	<0.0001
	No	77 (43.3%)	13 (12.7)	

Table 1: Comparison of clinicopathologic features between melanomas excised by general practitioners (GP) and by academic specialists (p-value by chi-square statistics except * by t-test). Unknown cases are not listed.

Table 2 shows the clinical diagnoses of the subgroup of nodular melanomas excised in an academic setting and by GPs. While 60% of the academic nodular melanomas were clinically diagnosed as melanoma, only 5.9% of the GP nodular melanomas were clinically diagnosed as such. While the clinical diagnoses of nodular melanomas missed in the academic setting were more spread over the categories “nevi” (13.3%), “fibroma” (6.7) and “granuloma” (6.7%), nodular melanomas missed by GPs were most often considered to be nevi (47%) of fibromas (11.8%).

Discussion

To identify which features characterize melanomas excised by GPs, we compared melanomas excised by GPs with those excised by dermatologists and surgeons in an academic practice. Skin melanomas excised by GPs were more often located on trunk and extremities found in females, of nodular type and Clark level III, and were less often radically removed.

Clinical differential diagnosis included melanoma in 14% of GP melanomas and 45% of academic melanomas. Of the GP melanomas, 64% was clinically considered to be a benign nevus in contrast with 38% of academic melanomas. This does not necessarily mean that GPs do worse in diagnosing melanoma, since GPs will usually refer patients

with highly suspicious lesions anyway, and the low index of suspicion lesions will be treated by the GPs.

The more frequent under diagnosis of melanomas by GPs is likely in part the reason that there were fewer radical excisions by GPs compared to the academic specialists, the latter at variance with a previous study [9]. A low index of suspicion will usually lead to a narrow primary excision with a higher risk of irradicality. Although some studies suggest that a primary irradical excision may not influence prognosis [10,11], the general consensus is to refer pigmented lesions with a high index of suspicion to a dermatologist or surgeon for a slightly wider local excision followed by re-excision and sentinel node biopsy [12,13] if indicated. The very fact that such patients are referred leads to an enriched “suspicious” population of lesions for which the academic specialists would inherently more often do more a slightly wider local excision, could also contribute to the higher rate of academic radical excisions. Indeed, the clinical diagnosis in melanoma cases was also melanoma in 45% of academic cases, while this was only 14% for GPs. Quite likely, at least part of these patients were referred because the GP already suspected a melanoma.

GP melanomas concerned remarkably more often women, for which we have no obvious explanation. Although this could be assumed to be confounded by site, our logistic regression made this unlikely. Women may prefer going to GPs while men prefer hospital treatment, indicating that patients may be driving excisions, or men may be more easily referred than women by GPs themselves. Although it cannot be excluded that melanomas in women are more easily under diagnosed, we can only speculate why.

Further, GP melanomas were more frequently of nodular type, which is a significant finding, in line with a previous study [14]. Nodular melanomas have a vertical rather growth pattern than the primarily horizontal growth pattern of superficial spreading melanomas. Nodular melanomas therefore present with higher Breslow thickness and Clark level, which may explain the finding of more Clark level III lesions in the GP group in the present study. Apparently, nodular melanomas are frequently under diagnosed by GPs as they disguise as benign nevus or may not be pigmented at all and mimick lesions fibroma (Table 2).

A potential confounder in this study is that we have no reliable data whether clinically benign lesions may have been excised for cosmetic/functional purposes. Nodular benign appearing lesions may have been excised for this reason, so we cannot with certainty state that nodular melanomas are more often misdiagnosed than superficial spreading melanomas if these would not be excised and therefore not detected. Nevertheless, because of the different grow patterns of nodular (vertical) and superficial spreading melanoma (horizontal) with its associated differences in prognosis, we feel it is important to bring the message of missing nodular melanomas by GPs. Growing awareness will contribute to earlier detection and thereby less deep growing (and thus prognostically more favorable) nodular melanomas.

Skin melanomas excised by GPs were significantly more often located on trunk and extremities while academic melanomas were more frequently located in the head&neck, hand/feet and face regions. This was an expected finding, since pigmented lesions in these latter regions will usually for technical reasons be referred to a dermatologist or surgeon irrespective of the index of suspicion.

These findings may be translated into more specific training of GPs with more specific focus on these features. Further, the gradual introduction of dermatoscopy in general practice may help here as suggested in several studies [15,16].

	Nevus	Fibroma	Seborrheic keratosis	Melanoma	Granuloma	Wart	Basocellular carcinoma	Cyst
Academic cases	2 (13.3%)	1 (6.7%)	1 (6.7%)	9 (60%)	1 (6.7%)	0	0	0
GP cases	24 (47%)	6 (11.8%)	3 (5.9%)	3 (5.9%)	5 (9.8%)	2 (3.9%)	1 (2.0%)	1 (2.0%)

Table 2: Clinical diagnoses of skin lesions bearing nodular melanomas excised in an academic setting and by GPs (cases with unknown clinical diagnosis not listed).

One issue is to which extent the study populations are representative for GP and academic melanomas. The GP melanomas were derived from a period of 12 years in which about 50,000 skin excisions were submitted for pathology by a group of about 600 GPs, spread over both urban and rural areas in the center of The Netherlands. We therefore feel that the study population of GP melanomas is likely representative for The Netherlands. Academic melanomas were selected from the same years to compensate for stage migration, and there are few reasons to assume that melanomas excised in the UMCU academic setting (not a reference center for familial melanoma patients) are different from those excised in other academic hospitals or even regional hospitals. Both study populations were diagnosed in academic pathology labs with melanoma a specialist, which makes it unlikely that different diagnostic criteria have led to the differences in the two study populations.

Although our data are from the pre-dermatoscopy era, they are likely still valid since dermatoscopy is in its infancy in general practice and certainly not yet the gold standard in The Netherlands and probably many other western European countries. This is related to the fact that dermatoscopy has not been proven to improve diagnosis for untrained or less experienced examiners, which applies to most GPs [17].

In conclusion, GPs seem to limit themselves to excising melanomas from the trunk and extremities. GPs remove more unsuspected skin melanomas, melanomas in women, and more nodular type melanomas than academic specialists. This indicates that especially nodular type melanomas (that are thicker and have in general a worse prognosis) are under diagnosed by GPs. This under diagnosing seems to result in too narrow margins on excision, leading to a lower proportion of radical excisions. Future studies will reveal to which extent dermatoscopy is useful here.

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