

Referral Pattern and Accuracy of Clinical Diagnosis of Cutaneous Melanoma

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Between 1981 and 1983, 329 patients with cutaneous melanoma registered in Amsterdam and Rotterdam, The Netherlands, were analysed with respect to the referral pattern and accuracy of clinical diagnosis. With increasing Breslow thickness, a greater proportion of the patients were referred to the surgeon than to the dermatologist ($p < 0.01$). The overall clinical suspicion rate was 61.6%. Suspicion of melanoma was greater for lesions ≤ 2 mm thick vis-à-vis the > 2 mm thickness group ($p < 0.01$). Accuracy of clinical diagnosis was better for dermatologists than for surgeons ($p < 0.01$, after adjustment for microstage). Differential diagnoses were more often considered by dermatologists than by surgeons ($p < 0.01$). Vague descriptions such as 'tumour' without specification were less frequently used by dermatologists than by surgeons ($p < 0.01$). Amelanotic melanomas were often missed clinically by both disciplines (overall diagnostic accuracy 28.6%). It is emphasized that close cooperation between dermatologists and surgeons in the clinical management of melanoma is highly desirable. (Received June 17, 1987.)

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The clinical diagnosis of cutaneous melanoma can be difficult. Early melanomas may mimic common naevocellular naevi, dysplastic naevi, Spitz's naevi, or other pigmentary lesions. More advanced melanomas are sometimes difficult to differentiate from a broad variety of solitary skin lesions, e.g. seborrheic keratoses when the lesion is pigmented, or pyogenic granulomas when the lesion is amelanotic.

Most specialists in the field (dermatologists as well as surgeons) are only sporadically confronted with melanoma and, in consequence, individual experience in this area is limited. A correct clinical diagnosis (index of suspicion) accounts for about 50-75% of melanoma cases (1, 2, 3). No recent detailed information on the accuracy of clinical diagnosis or on referral patterns exists. Therefore, we wondered how accurate the clinical diagnosis of melanoma is and whether the suspicion rate is correlated with the referral pattern.

MATERIALS AND METHODS

From 1981 through 1983, 329 patients with cutaneous melanoma were registered in a number of clinics in Amsterdam and Rotterdam, The Netherlands. Participating institutes included two large oncology centres, two university hospitals and nine general hospitals. Melanoma diagnoses were collected from the pathology laboratories in the respective areas. Information on the clinical diagnoses and the referral patterns until diagnostic intervention was gathered from the case notes, from the histopathological reports and from detailed patients' questionnaires. Only diagnostic procedures carried out on the primary tumour or on locally recurrent disease (i.e. previously treated without histopathological examination) were included.

The accuracy of the clinical diagnosis was related to the medical specialty performing the diagnostic biopsy. It appeared that most biopsies were performed by either the dermatologist or the surgeon. In some instances the diagnostic procedure was performed by another discipline, e.g. a general practitioner, a gynecologist or an ENT specialist. After exclusion of those patients who underwent initial diagnostic intervention on a metastatic lesion and those who were initially treated by another specialty,

there remained 296 cases for study. Accuracy of clinical diagnosis was further correlated to two important biological characteristics of the primary lesion: Breslow thickness and degree of pigmentation. Likelihood ratio χ^2 -tests were performed to analyse differences between patient categories. Where appropriate, a logistic regression procedure was also performed.

RESULTS

Of the 296 evaluable cases, 159 (54%) were primarily referred to the dermatologist and 137 (46%) to the surgeon. In 71 out of the 159 cases referred to the dermatologist (45%), the dermatologist himself performed the diagnostic procedure, whereas in 88 instances (55%) the patient was referred to the surgical specialist for diagnostic intervention.

The referral pattern differed according to the Breslow thickness (Table I). With increasing thickness, patients were more frequently initially referred to the surgeon, bypassing the dermatologist ($p < 0.01$). The number of cases referred to the surgeon increased from 36% for lesions ≤ 1 mm thick to 73% for lesions > 4 mm thick. In all thickness categories the proportion of patients biopsied by the dermatologist was smaller than those referred by the dermatologist to the surgeon (ratio 2:3). Only in the unknown thickness category was diagnostic biopsy more frequently carried out by the dermatologist himself.

The overall clinical suspicion rate was 62%. Suspicion of melanoma was greatest in the favourable microstage groups (Table II). Melanoma was considered in 95 out of 130 cases with tumour thickness ≤ 2 mm (73%) and in 56 out of 103 cases with thickness > 2 mm (54%; $p < 0.01$). It appeared that the spectrum of clinical diagnoses roughly correlates with the discipline to which the patient was initially referred. Thus, clinical diagnoses of lesions that were first seen and biopsied by the dermatologist were more or less the same as the diagnoses of lesions that were first seen by the dermatologist and then referred to the surgeon for diagnostic intervention. On the other hand, the range of diagnoses was quite different in those cases that were immediately managed by the surgeon. Therefore, in Table II the first two categories are considered together. Dermatologists scored better in their clinical assessment of melanoma than did surgeons ($p < 0.01$, after adjustment for microstage). Only in the unknown thickness category was melanoma considered more frequently by surgeons (12/18=67%) than by dermatologists (4/20=20%; $p = 0.01$). The proportion of cases in which melanoma was considered as the first possibility, vis-à-vis the second or third differential diagnosis, was very constant in all subgroups studied.

The most frequent single diagnosis reported was melanoma (37%), followed by naevus (17%) and 'tumour' without further specification (10%). These three diagnoses comprised

Table I. Referral pattern according to lesion thickness; percentages are given in parentheses

Breslow thickness	Number of cases	Referral pattern from family physician to		
		dermatologist	dermatologist → surgeon	surgeon
≤ 1 mm	81	22 (27.2)	30 (37.0)	29 (35.8)
1-2 mm	59	12 (20.3)	24 (40.7)	23 (39.0)
2-3 mm	35	8 (22.9)	9 (25.7)	18 (51.4)
3-4 mm	27	5 (18.5)	7 (25.9)	15 (55.6)
> 4 mm	45	4 (8.9)	8 (17.8)	33 (73.3)
Unknown ^a	49	20 (40.8)	10 (20.4)	19 (38.8)

^a Unknown Breslow thickness includes 31 cases with inaccurate histopathology reporting or initial partial biopsy of the lesion precluding correct assessment of thickness, and 18 cases with locally recurrent disease in which thickness measurement has no significance.

Table II. Accuracy of clinical diagnosis according to referral pattern and lesion thickness; 14 cases with insufficient clinical information are excluded; percentages are given in parentheses

Tumour thickness and referral pattern ^a	Number of cases	Clinical diagnosis		
		Melanoma first diagnosis	Melanoma second/third diagnosis	Other diagnosis
Breslow ≤2 mm				
Dermatologist	81	47 (58.0)	17 (21.0)	17 (21.0)
Surgeon	49	22 (44.9)	9 (18.4)	18 (36.7)
Breslow >2 mm				
Dermatologist	39	20 (51.3)	7 (17.9)	12 (30.8)
Surgeon	64	23 (35.9)	6 (9.4)	35 (54.7)

^a Referral pattern = specialist to whom the patient was initially referred; dermatologists are considered as one group whether they performed the diagnostic procedure themselves or referred the patient to the surgeon for diagnostic intervention.

73% of all surgeons' diagnoses vis-à-vis 54% of the dermatologists' diagnoses ($p < 0.01$). 'Tumour' without specification was the first diagnosis considered in 2 out of 120 lesions initially seen by the dermatologist (2%) and in 21 out of 113 cases of the surgical group (19%; $p < 0.01$). A differential diagnosis (more than one clinical diagnosis) was more often entered on the record by the dermatologist than by the surgeon (50/140=36% vs. 26/131=20%; $p < 0.01$).

There were 29 melanomas that were clinically largely amelanotic. Amelanotic melanomas were encountered predominantly in the advanced microstage categories; 2 out of 140 lesions ≤2 mm thick were amelanotic (1%) compared with 20 out of 107 lesions >2 mm (19%; $p < 0.01$). Amelanotic melanomas were more often initially referred to the dermatologist than to the surgeon (not statistically significant; $p > 0.05$). Dermatologists usually performed the diagnostic biopsy on amelanotic lesions themselves rather than referring them to the surgeon; 11 out of 14 amelanotic cases seen by the dermatologist were immediately biopsied (79%) compared with 60 out of 144 pigmented tumours (42%; $p = 0.04$). The suspicion index of amelanotic melanomas was low; in 36% of dermatological cases and 21% of surgical cases, melanoma was considered as one of the possibilities (overall index of suspicion 29%). Granuloma or pyogenic granuloma were the most frequent first clinical diagnoses (9 cases), followed by 'tumour' without specification (8 cases) and melanoma (4 cases).

DISCUSSION

Clinical information on the referral pattern of cutaneous melanoma in relation to tumour thickness and suspicion rate has never been reported. The present study shows that the referral pattern of cutaneous melanoma depends on the clinical picture at the time of first doctor's attendance. Family physicians tend to refer early (thin) melanomas to the dermatologist and late (thick) lesions to the surgeon. Thus, it appears that when there is a *diagnostic* problem, referral to the dermatologist ensues, whereas a *therapeutic* problem is more often directly referred to the surgical specialist.

The referral pattern of amelanotic melanomas is in keeping with this observation. Amelanotic melanomas are more often referred to the dermatologist than to the surgeon despite the fact that amelanosis signifies an unfavourable microstage. Probably amelanotic

melanomas are not readily recognized as such by the general practitioner. They thus represent a diagnostic problem rather than a therapeutic one and referral to the dermatologist is apt to occur. This also applies to the subsequent action taken by the dermatologist. On the whole, in The Netherlands the majority of primary melanomas seen by the dermatologist are immediately referred to the surgeon for further management. However, fewer than one-third of amelanotic primaries are referred to the surgeon; most of them are biopsied by the dermatologist himself. This concurs with the low clinical suspicion of these lesions. Apparently, amelanotic melanomas represent a diagnostic dilemma not only to the general practitioner but also to the dermatologist.

In this series, stage by stage, dermatologists produced a more accurate clinical diagnosis than surgeons. This held true for both categories of patients biopsied by the dermatologist himself and those biopsied by the surgeon after referral by the dermatologist. Dermatologists offered a broader range of differential diagnoses and they rarely used non-specific terms like 'tumour' without further specification. An interesting point is that both dermatologists and surgeons were less good at diagnosing thick than thin melanomas. We have no explanation for this.

Accuracy of clinical diagnosis largely depends on the experience and vigilance of the managing clinician. Many authors have emphasized the difficulties in clinical diagnosis of melanoma. Accuracy of clinical appraisal varies from 48% to 77% (1, 2, 3). In this respect the 'diagnostic accuracy' (or 'index of suspicion') is defined by the percentage of all histologically proven melanomas that were clinically diagnosed as such. The overall index of suspicion of 76% among dermatologists in this series may be lower than for instance in academic dermatology departments with a special interest in melanoma problems. In a similar study from Münster, FRG, it was shown that at the university dermatology department during 1981-83 the accuracy of clinical appraisal was 92% (Dr S. Menzel, personal communication).

The present study underscores the desirability of close cooperation between dermatologists and surgeons in the management of primary melanoma of the skin. Accurate diagnosis of melanoma is the first step in its appropriate treatment. The relative lack of proper recognition of melanoma by non-dermatologists raises serious concern about the effectiveness of their subsequent treatment plans (4, 5). The ability to recognize problem lesions requires visual skills that are often deficient among non-dermatologists.

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