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Cutaneous malignant melanoma: audit of the diagnostic process

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The results of a study of the diagnostic process in 202 cutaneous malignant melanomas over a 5-year period in one region are presented. Patient delay of more than 3 months was noted in at least 60% of cases, and delay after presentation was identified in 21% of the case histories. In 12% of the cases an opportunity for earlier diagnosis had been missed. The factors leading to delay in diagnosis are highlighted and the need for the dissemination of information relating to the early stages of the disease is emphasised.

Studies from different parts of the world have shown a steady increase in cutaneous malignant melanoma over the last decade *(1, 2)*. This previously relatively rare tumour has a poor prognosis unless it is treated in the early stages. Breslow demonstrated that the measured thickness of the tumour was the most significant prognostic factor *(3)*, and current efforts have been aimed at achieving earlier diagnosis with the hope that this will increase the proportion of tumours in the thin, good prognosis category. Late presentation by the patient is cited as the most significant reason for late diagnosis and a number of public health education campaigns have been undertaken to alert the general public to the danger of changing or growing moles. This heightened awareness has increased the numbers of pigmented lesions referred for specialist opinion and, it is hoped, will improve the future outcome for those diagnosed as having malignant melanoma.

Nevertheless, there are still case reports of missed melanomas *(4,5)*, and the overall average Breslow thickness in reported series is disappointingly high. A pilot study carried out in Tayside in 1982 indicated that an element of delay was occurring after presentation. This prospective study was therefore instituted to identify the reasons and to find ways of eliminating any medical delay. It should be emphasised that the study includes all tumours diagnosed in the region; this is an important difference to remember when comparison is made with other recent studies, especially those of lesions referred to pigmented lesion clinics. The patients attending these clinics are a selected subgroup, where the potential for malignancy in a mole has been recognised either by the patient or the primary physician. This study includes patients in outlying areas, those where the presentation has been confusing and those who have presented to specialties not normally involved in the diagnosis of skin lesions. This gives a more complete, but perhaps less reassuring picture of the current situation.

Methods

All patients in the Tayside Region with a diagnosis of cutaneous malignant melanoma made histologically between November 1982 and August 1988 were recruited for the study. The majority of patients were referred at some point in their management to the plastic surgery unit and were interviewed by a member of the medical staff using a questionnaire. A minority of patients were treated at other hospitals and data directly from the patient was not available, but relevant information, where recorded in the cases notes, has been utilised.

The length of time a lesion had been present was recorded (duration of lesion), as was the time elapsed from any incidence of change in the lesion as recalled by the patient. The complaints at presentation and the reason for the primary consultation were noted. The

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pathway of referral and the date of the primary consultation and subsequent appointments leading to histological diagnosis were recorded, as was the incidence of other medical contacts during the life history of the lesion. The patients were also questioned about factors which had influenced their decision to seek advice about the lesion. Finally, the pathological diagnosis was reviewed by one pathologist, a member of the Scottish Melanoma Group panel.

Results

A total of 199 patients with 202 primary malignant melanomas were diagnosed in Tayside during the study period, an incidence of 8.7 new tumours/year per 100 000 of the population. (The incidence for Scotland for essentially the same period was 6.7 cases/year per 100 000 of the population.) The mean age was 59 years and the sex ratio was 1:2 male to female. Initial specialist referral was to dermatology in 44% of cases, to plastic surgery in 41% and 15% were referred to other specialties.

Table I reports the site and histological type of the tumours. The mean Breslow thickness was 2.47 mm, median 1.42 mm; 52% of the tumours were in the relatively good prognosis group with a thickness of 1.5 mm or less, 29% were less than 0.76 mm and 21% were 3.5 mm or more in thickness.

Patient delay

Table II gives details of the length of time the lesion had been present and duration of any change in the lesion noted by the patient before presentation.

Symptoms

Table III details the reason given for the initial consultation and the incidence of symptoms and signs noted by the patients.

Table I. Characteristics of tumours

Site	
Head and Neck	19%
Upper Limb	18%
Trunk	20%
Lower limb	43%
Histological type	
Superficial spreading melanoma	69%
Lentigo maligna melanoma	11%
Nodular melanoma	9%
Acral lentiginous melanoma	6%
Unclassifiable	5%

Table II. History and change of the lesion

Length of history of a lesion	
Longstanding lesions (>10 years)	44%
Lesion present 5 to 10 years	9%
Lesion present 1 to 5 years	25%
Lesion present less than 1 year	10%
History unavailable	12%
Duration of change in the lesion	
Patient unaware of any change	10%
Change 3 months or less before diagnosis (Mean Breslow thickness 2.37 mm)	25%
Change 4 to 9 months before diagnosis (Mean Breslow thickness 2.22 mm)	26%
Change 10 to 23 months before diagnosis (Mean Breslow thickness 2.73 mm)	18%
Change for 2 years or longer (Mean Breslow thickness 2.53 mm)	16%
No available details	5%

Table III. Reason for initial consultation and symptoms and signs

Reason given for primary consultation	
Pressure from family/friends or media information	26%
Incidental finding	25%
Change in the lesion	21%
Bleeding	15%
Other reasons	13%
Incidence of major symptoms on presentation	
Change in size	46%
Change in colour	33%
Bleeding	30%
Elevation	11%
Sensory change	3%
Ulceration	2%

Media and other influences

In only 176 of the 199 patients was there detailed information available from the questionnaire. Of these patients, 35% attributed a positive influence to some form of media information and 10% said they had consulted their doctor as a direct result of a specific article or programme. One patient reported a negative influence, having been reassured by the answer to a reader's question printed in a magazine. Patients were also asked about other sources of information, and 10% said they had been told by family or friends, various versions of 'moles should not be interfered with' or 'removing moles can make them turn nasty'. Two patients who had undergone medical training in the 1940s remembered being taught that 'melanoma was incurable and that moles should never be removed'. In contrast, 26% cited the insistence of a family member or friend (often with a nursing or medical background) as the main reason for consulting their doctor. Fear of the

Table IV. Classification of the referral pathways

Patient initiated/immediate referral to specialist	68%
Incidental finding/immediate referral	21%
Patient initiated/delayed referral or diagnosis	22%
Missed opportunity for incidental diagnosis	12%

diagnosis was only mentioned as a delaying factor by two patients in this study.

Medical referral pathway

The case history of each of the patients was reviewed and classified according to Table IV. The categories are not exclusive, for example, a melanoma not diagnosed or referred on first presentation (delayed referral) might be spotted by a colleague at a subsequent consultation (incidental finding). The patient's immediate past medical history was also reviewed in an attempt to assess whether an opportunity for earler diagnosis had existed. A missed diagnostic opportunity was recorded where the patient had had a recent hospital admission or, in the cases of facial lesions, a visit to their general practitioner or an outpatient clinic. For example, two patients who had a melanoma on the temple had been attending a clinic with temporal arteritis.

Timing of referral pathway

After referral to the hospital for a specialist opinion, the mean wait for an outpatient's appointment was 25 days (Table V). Only 44% of the referral letters requested an urgent appointment, and this was one factor contributing to delay. The plastic surgery unit routinely screens all letters and reclassifies as urgent any where suspicious features are mentioned. For these clinics the average wait was reduced to 15 days. However, in only 78% of the referral letters was pigmentation mentioned. Patients' failure to attend appointments was a delaying factor in three cases, and some delay was caused by social factors, such as holidays, in at least four patients. Of the patients, 26% had been seen within 1 week, 50% waited from between 7 and 28 days. Only 4% waited more than 84 days.

Table V. Timing of diagnostic events

	Mean	*Median*	*Range*
Time from change in lesion to visit to GP	10.0	6	0–72 months
Time from change to diagnostic biopsy	11.94	7	0–86 months
Time from first GP visit until specialist appointment	25	17	0–54 days
Time from specialist appointment to biopsy	31	9	0–109 days

The mean time from first hospital contact to diagnostic excisional biopsy was 31 days. However, 42% were biopsied within 1 week, and a further 42% were biopsied within 4 weeks. Only 14% waited longer than 84 days.

Medical delay

In the analysis of 43 (21%) of the case histories, an element of medical delay (that is delay between the first medical contact and biopsy of the lesion) was detected (Table VI). Delays due to the system occurred in six cases and delay due to patient non-attendance in three. In 14 (7%), the significance of the lesion had not been appreciated by the first doctor consulted, referral being postponed until the lesion developed further or the patient was seen by a colleague. In 21 (10%), a mistaken diagnosis led to delay. Mistaken diagnosis was most commonly associated with acral lentiginous melanoma (7 out of the total of 13 cases with this histological type). A previous diagnosis of lentigo maligna was judged to have led to delay in six cases. Of the remaining cases in this group (superficial spreading (19), nodular (6), or unclassified (5)), a further four lesions were seen in the area of the nails, palm or sole. In seven cases there was a history of previous treatment by excision or curettage without histological examination, or of cryotherapy. The performance of an incisional biopsy led to delay in two cases. The diagnosis of the primary lesion was made only after biopsy of secondarily enlarged lymph nodes in five patients, even though suspicious features were present in all but one of the primary lesions.

It was not possible to define the delay accurately in six cases, but in the remaining 37 patients the mean delay was 43 weeks, ranging from 4 weeks to 3 years. In 21

Table VI. Characteristics of lesions where delay in diagnosis occurred

No. of lesions seen where delay occurred	43
Histological types	
Superficial spreading	19
Lentigo maligna melanoma	6
Nodular melanoma	6
Acral lentiginous melanoma	7
Unclassifiable	5
Lesions where delay was greater than 3 months	
No. of lesions	41
Mean Breslow thickness	3.36 mm
Reasons for delay	
Malignant melanoma not considered in differential diagnosis	35
Patient factors eg non-attendance	3
Delay due to the system	6
Curette/cryotherapy/excision with no histology	7
Incisional biopsy causing diagnostic delay	2

patients (10%), delay as a result of medical uncertainty was more than 3 months. The mean Breslow thickness of this group was 3.8 mm.

Discussion

Early diagnosis and treatment is an important prognostic factor in all malignant disease. For most tumours the major problem is to develop suitable methods of detection of the early lesion. When dealing with cutaneous pathology, the skin is freely available for inspection and the problem is one of the differentiation of benign from early malignant lesions.

In the United Kingdom there are still a large number of tumours which are advanced at presentation. Doherty and MacKie *(6)* link the poor prognosis with lack of public awareness and subsequent delay in seeking medical advice. This survey did not find that delay expressed as length of history correlates directly with tumour thickness if all tumour types are included. Cassileth *et al. (7)* had the same finding although Temoshok *et al. (8)* demonstrated a relationship for non-incidentally diagnosed tumours of certain histological types. Early diagnosis does not guarantee a thin tumour as the natural history of individual tumours will vary. The growth rate may also vary during the life of an individual tumour, making delay at different stages more or less significant. However, prompt presentation and biopsy of all tumours at the time of change should lead to an increase in the proportion of thinner tumours diagnosed.

Avoidable delay occurs in a high proportion of patients. This delay can be attributed to three main causes; delay by the patient in reporting a changing lesion; communication delays in the medical referral system; and delays caused by mistaken or missed diagnosis.

At present it appears that a large part of patient delay is attributable to ignorance of the significance of change in a pigmented lesion. Bleeding, a late symptom, was frequently given as the reason for consulting a doctor, whereas slow change was allowed to continue unreported until large size became a reason for seeking advice or the cause for comment by others. Future publicity material should emphasise that any change occurring in a lesion, even if it is slow and painless, may be significant, and a minimum size criterion should be abandoned as it could deter patients with early lesions from reporting for treatment. Recent publicity campaigns *(9)* have been successful in the short term, but continued effort is necessary to alter public attitudes permanently.

Fear of the diagnosis is a common feature of malignant disease, but in this series only two patients actually delayed seeking treatment because of fear. However, there is a deeply rooted belief that harm is caused by interfering with a mole, 10% of the patients surveyed having heard various versions of an 'old wives' tale' advising against removal of moles. These fears may be derived from the newspaper coverage of a paper published in 1944 in the *Lancet (10)*. It was not possible to quantify the extent to which this erroneous belief deterred patients from seeking treatment, but it did cause anxiety in several patients who submitted themselves to biopsy, having been told by an older relative that 'moles which are operated on spread and kill you'. It is important to take these fears and those generated by the increased awareness itself into account in the design of future educational material for the public.

Delay occurs in the medical management for a variety of reasons. For the majority of patients the correct management (referral) was instituted, but it was not always classified as urgent, causing a longer wait for the outpatient appointment. Where the urgency is recognised, referral by telephone or referral to a pigmented lesion clinic (if available) facilitates rapid biopsy. Improved performance at this stage requires a good knowledge of benign skin pathology and a high index of suspicion among general practitioners, especially for the early lesion which may more closely resemble a small benign lesion rather than the textbook picture of a large, dark, obvious neoplasm. Even where the significance of a lesion has not been appreciated by the general practitioner a clear, descriptive letter can alert the specialist to send out an urgent appointment. Postgraduate programmes can be used with good effect to improve performance, at least in the short term (unpublished data). If all brown skin lesions, whether changing or not, are referred indiscriminately there is a danger that the system will become overloaded, leading to delay in the treatment of suspicious lesions.

The majority of medical delays over 28 days before biopsy were the result of mistaken diagnosis. Delay is more likely to occur with the less common types of melanoma which do not fit the 'changing mole' pattern. Malignant melanoma should be included in the differential diagnosis of apparently inflammatory conditions of fingers or toes, especially if there is no response to initial treatment. Fungal infection was a common initial diagnosis which led to delayed presentation of lesions in these sites. Similarly, melanoma should be considered during the investigation of unexplained lymph node enlargement. The malignant potential of lentigo maligna appears to be misunderstood, and two melanomas of this type were missed when the edge of a lesion was biopsied. Failure to send curettings for histology was another avoidable cause of delay, particularly associated with amelanotic tumours. It is in the diagnosis of the unusual lesions that medical awareness is most crucial, as by their nature there is no well-defined pattern about which patients can be warned.

The rate of incidental melanoma diagnosis shown in this series is encouraging. Nevertheless, the 12% of cases where the diagnosis has not been made, even when a doctor has the lesion in his field of vision, shows that an increased emphasis needs to be placed on the teaching of examination of the skin. The mean Breslow thickness (4.08 mm) of this group of 'missed tumours' may reflect the falsely reassuring effect of a practitioner not commenting upon a lesion. A simple question as to the presence of any changing skin lesions during a history

taking, coupled with an examination of the skin as advocated by Monk *et al. (11)* would prove a useful addition to routine admission procedures. Similarly, nurses, whether in the ward or in the community, should be alerted to the suspicious signs and symptoms as they have the opportunity to observe the patient's skin. A routine display of interest in skin lesions by the profession in general would help to reinforce the message of current publicity.

In spite of the slightly higher incidence of melanoma in Tayside compared to the rest of Scotland, the percentage of thinner tumours diagnosed in this 5-year period matches the improved levels quoted in the recent study from the west of Scotland after a publicity campaign *(9)*. Doherty and MacKie *(9)* identified little apparent medical delay, but were studying patients referred to a pigmented lesion clinic, which indicates a degree of selection. The mean diagnostic delay of 56 days in this series compares favourably with the mean physician delay of 3.9 months found by Cassileth *et al. (12)* in the United States of America, and 2.9 months in a study from Northern Ireland *(13)*. In the present situation, where the majority of patients delay seeking advice, rapid biopsy may not make a detectable difference *(14)*, but added medical delay can and should be reduced as far as possible.

Present efforts towards improving the prognosis must be directed at raising the level of awareness of melanoma among the general population and all medical practitioners. Publicity campaigns should be aimed at alerting the public to the symptoms and signs of early melanoma without generating undue alarm. A rapid referral system should be established to meet local needs. Concurrent initiatives to update the knowledge and increase the index of diagnostic suspicion of all medical workers will allow maximum benefit to be obtained from the increased public awareness.

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Assessor's comment

As the incidence of cutaneous malignant melanoma is increasing rapidly and the fact that melanoma can be cured if discovered and treated early, makes this an important paper, identifying delay not only in presentation but also after referral. It is worrying that 12% of the cases in Tayside were, in fact, wrongly diagnosed. I agree wholeheartedly with the authors that there is a great need for widespread and intensive education of both the profession and the public.

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