Clinical diagnosis of melanoma
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Clinical diagnosis of Melanoma

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"Melanoma" is considered to be the malignant tumour of melanocytes. For this reason in this paper the adjective "malignant" is not used.

Introduction

Early recognition and prompt excision of primary cutaneous melanoma is the course of action most likely to improve the patient's survival prospects. If cutaneous melanoma is diagnosed when it is a level I or "in situ" melanoma (all malignant cells are still confined to the epidermis above the basement membrane) the cure rate is close to 100%.

It therefore follows that all doctors, both specialists and general practitioners should be aware of the clinical features of early cutaneous melanoma. It is difficult to achieve this by direct personal experience, because although the incidence of melanoma is increasing rapidly, no individual has a great experience unless they work in a specialist centre. At present the highest recorded incidence of melanoma is around 40 new cases per 100,000 per year in Australia and there is a 1 in 60 lifetime risk of developing melanoma in that country. It is now the third most common cancer in Australia.

The incidence of melanoma is steadily increasing, and most large studies suggest that in all parts of the world it is doubling over a 10 year period. However mortality is increasing less rapidly. The difference between increasing incidence and mortality is attributed to earlier diagnosis. Treatment modalities have not changed dramatically in the past 20 years (see below), but the proportion of melanomas removed when they are in an early thinner curable stage has increased. This increase in the proportion of thin melanomas has been particularly marked in parts of the world where intensive public and professional early detection education programmes have been carried out.

Studies from all parts of the world confirm that the most important feature in predicting survival for the patient with melanoma is the tumour thickness measured according to Breslow's method. Patients whose melanoma is excised when it is less than 1mm thick have a 90%+
prospect of disease free survival at 5 years, and few patients have recurrences after this time. In contrast, patients whose tumours are thicker than 3.5mm but who have no evidence of distance spread at the time of primary surgery have a disease free 5 year survival of only 50%. These figures illustrate the extreme need to improve early diagnosis.

The treatment of primary cutaneous melanoma is surgical. Over the past decade the recommended resection margins for melanomas of varying thicknesses have been reduced. At the present time it is suggested that a margin of 1 cm of normal skin is all that is required around a melanoma with a (tumour) thickness of less than 1mm. There are ongoing studies trying to define appropriate resection margins for tumours in the thicker categories. To date there are no studies suggesting that adjuvant therapy given to patients with thick tumours after complete excision offer any survival benefit. There are ongoing studies to assess the value of adjuvant arterial perfusion and the results of the potential beneficial effect of the use of both vaccines and of adjuvant interferon alpha therapy.

Clinical diagnosis

Clinical features of patients with melanoma

The great majority of patients with melanoma are adults. Melanoma is very rare in pre-pubertal children. The average age at presentation with melanoma worldwide is in the late 40s or early 50s. Thus cutaneous melanoma in 50% of cases involves younger adults. In many parts of Europe more females than males develop melanoma, but in higher incidence countries such as Australia and United States the distribution of melanoma between the sexes is approximately equal.

The commonest site for melanoma in females is on the lower leg between the knee and the ankle, and the commonest site for males is on the trunk, most commonly the back. In both sexes in the older age groups (65 years of age and over) the commonest site is the face.
Sub-types of value in melanoma

Melanoma has traditionally been divided into 4 groups on both clinical and pathological features. These are:

- the superficial spreading melanoma, (Fig. 1)
- the lentigo maligna melanoma, (Fig. 2)
- the acral lentiginous melanoma, (Fig. 3) and
- the nodular melanoma (Fig. 4)

In addition there are rarer variants of these types of melanomas such as the desmoplastic and neurotropic variants.

The first 3 entities can be taken together as types of melanoma which begin with a lateral spread across the skin surface, seen pathologically as the radial growth phase. Over a varying period of time, these laterally spreading tumours usually develop nodular invasive components. In contrast the melanoma which is nodular from the beginning has no surrounding lateral spread but is a deeply invasive nodule from the first point in time when it can be clinically recognised.

In most studies of Caucasian populations, superficial spreading melanoma comprise around 60%-75% of all melanomas, lentigo maligna melanomas around 5 to 15%, acral melanomas around 8%, and 15% are nodular melanomas.

There is some disagreement as to how many cutaneous melanomas arise in association with preexisting naevi. The clinical impression is that around a half of melanomas arise in this setting but pathologists tend to see only around 30% showing evidence of association with benign naevus cells.
Fig. 1 - Black cutaneous lesion of the back with irregular serrated margins, well defined edge and central regression. **Histology:** Superficial spreading melanoma, Clark level III, thickness 1.82 mm.

Fig. 2 - Reddish-brown to black unevenly coloured irregular lesion arising on left mandibular, more than 1 cm in diameter. **Histology:** Lentigo maligna.

Fig. 3 - Female aged 84. Black irregular flat lesion of the left hand. **Histology:** acral lentiginous melanoma, Clark level III, thickness 3.5 mm.

Fig. 4 - Nodular melanoma of the leg in female aged 45. **Histology:** Clark level IV, thickness 3.8 mm.
Checklists of value in the diagnosis of melanoma

There are 2 checklists which may be of value in the diagnosis of melanoma. The first of these is the ABCD system devised in the United States and which appears more relevant for well established melanoma. The second of these is the Glasgow 7 point checklist. Details of these 2 checklists are shown in Tables 1 & 2.

The clinical appearance and clinical differential diagnosis is varied when very early melanoma is compared with established melanoma, and for this reason established and early melanoma will be considered separately in this paper. We will begin with describing established melanoma.

Table 1 - ABCD System

<table>
<thead>
<tr>
<th>ABCD System</th>
<th>GLASGOW System</th>
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<tbody>
<tr>
<td>A = Asymmetry</td>
<td>1 = Change in size</td>
</tr>
<tr>
<td>B = Boundary</td>
<td>2 = Change in shape</td>
</tr>
<tr>
<td>C = Colour</td>
<td>3 = Change in colour</td>
</tr>
<tr>
<td>D = Dimension</td>
<td>4 = Inflammation</td>
</tr>
<tr>
<td></td>
<td>5 = Crusting or bleeding</td>
</tr>
<tr>
<td></td>
<td>6 = Sensory change</td>
</tr>
<tr>
<td>(diameter &gt; 6 mm)</td>
<td>7 = Diameter &gt; 7 mm</td>
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</tbody>
</table>
Established melanoma

Established melanoma which has a laterally spreading component (superficial spreading, lentigo maligna, and acral melanomas) usually presents as an irregular pigmented lesion measuring lcm or more on any body site. As previously stated, the site is most likely to be on the lower leg in women, and the back in men. They are recognised as irregular brown or black lesions with an irregular lateral margin and with a lack of symmetry when two halves of the lesion are compared. Within the lesion there are variations in shades of brown or black, and some degree of erythema or grey or white pigmentation is often seen. This is the clinical sign that there is some degree of regression (Figs. 5-9) which is seen pathologically as an attack on the melanoma cells by the body’s immune system in the form of lymphocytes. While some degree of partial clinical or pathological regression is very common in melanoma, complete regression is rare. (Fig. 10)

Over time, laterally growing melanoma will develop raised palpable nodular areas. This is a sign that the developing melanoma has reached the vertical growth phase, and at this point it is believed that clones of more aggressive tumour cells grow down from the original lesion. Some of these tumour cells in the vertical growth component have the capacity to metastasise and kill the patient. The development of elevated palpable nodules on any previously flat surface pigmented lesion must therefore be regarded with concern. (Figs. 11, 12)

Late primary melanomas may develop an ulcerated surface that may ooze and crust, and occasionally there is frank bleeding. (Figs. 13, 14)

Established melanoma of the nodular type is more difficult to recognise clinically (Fig. 4). This type of melanoma frequently grows quite rapidly, and the patient may give a history of a lesion developing over a period of only 3 to 4 months. There is usually a very sharp margin between a raised papular area on the skin surface and surrounding normal skin. The papular area may be brown or black, but often has a more red tinge. Amelanotic nodular melanomas also occur (Fig. 15). These are melanomas with relatively little pigment associated. This pigmenta-
**Fig. 5** - Black and brown, irregular, palpable skin lesion of the left thigh. Note that all the ABCD features are present. **Histology:** Superficial spreading melanoma, Clark level IV, 3.25 mm thick, regression present.

**Fig. 6** - Brown, flat-surfaced portion in upper right represents clinically the radial growth phase. Black elevated nodules represent vertical growth phase. **Histology:** Superficial spreading melanoma with both radial and vertical growth phase present.

**Fig. 7** - Female aged 63. Melanoma on thigh which has invaded to Clark level IV and is 1.2 mm thick.

**Fig. 8** - Black cutaneous partially elevated lesion of the upper back with irregular coastline-like margins, well-defined edge and central regression. This is a well established melanoma. **Histology:** Nodular melanoma, Clark level V, Breslow thickness 10.4 mm, ulcerated, high mitotic index.
Fig. 9 - Irregular lesion on back with elevated reddish-black islands and central smooth depigmented area. The history of a regressed naevus confirms the melanoma diagnosis, but even without a history this lesion is a typical regressed melanoma. **Histology:** Superficial spreading melanoma 0.60 mm thick.

Fig. 10 - Greyish oval lesion with prominent non-pigmented halo, arising on the back of a 19 year old boy. This is a very difficult diagnosis. The depigmented halo provides a clue and the history (regression of naevus) suggests a diagnosis of melanoma. **Histology:** Regressed melanoma.

Fig. 11 - Female aged 24. Melanoma of superficial spreading type on thigh which has invaded to Clark level IV and is 1.63 mm thick.

Fig. 12 - Black and brown, asymmetric, palpable skin lesion of the back with small central grey-white area. Note all the ABCD features are present. **Histology:** Superficial spreading melanoma, Clark level IV, Breslow thickness 0.98 mm, with regression, not ulcerated.
Fig. 13 - Frank bleeding of a depigmented nodule (black pigmentation remains on part of the nodule) arising in congenital naevus of the right forearm. (This diagnosis is difficult but the whole lesion should be removed with 1 centimeter margins for histological examination.) Size: the lesion (congenital naevus) measures 7 cm in largest diameter and shows a centrally located round elevated area, 1.1 cm in diameter, ulcerated. **Histology:** Nodular melanoma, ulcerated, Clark level IV, 4.5 mm thick, associated with dermal congenital naevus.

Fig. 14 - Large pigmented skin lesion of the retroauricular region with surrounding erythema and bleeding nodule. The clinical diagnosis of melanoma is easy in this case. **Histology:** Nodular melanoma, ulcerated and polypoid > 10 mm thick, Clark level III.

Fig. 15 - Cutaneous lesion of the back in male aged 30. The diagnosis of cutaneous melanoma might be suggested by the presence of pigmented spots at the peripheral area. **Histology:** acromic melanoma, Clark level IV, thickness 4.2 mm.
tion is very often distributed in a narrow rim around the edge of the lesion. This is due to the fact that the melanoma cells are multiplying so rapidly that there is little time for synthesis of melanin pigment.

**Differential diagnosis of established Melanoma**

The following entities should be considered in the differential diagnosis of established melanoma:

- Seborrheic keratosis
- Pigmented basal cell carcinoma
- Thrombosed angioma
- Pyogenic granuloma
- Dermatofibroma

**Seborrheic keratosis**

Studies of early detection campaigns for melanoma suggest that seborrheic keratoses are one of the commonest causes of confusion in the diagnosis of melanoma. Seborrheic keratoses are very common in individuals aged 50 or over, and are usually found on covered sites such as the trunk. They are usually well demarcated grey or brown lesions which have a dull hue and a scaly surface. When examined in profile they appear to be above the level of the normal surrounding skin and may have a rather stuck-on appearance. The surface may be cerebriform (i.e. have a surface rather like a piece of brain tissue) and has a rather greasy look. (Figs. 16, 17)

**Pigmented basal cell carcinomas**

While the majority of basal cell carcinomas are easily recognised, a small proportion have some central pigment which may be either melanin or altered blood. These lesions may sometimes cause confusion with melanoma. The colour here is usually grey or blue black rather than brown
and there may be visible capillaries associated with the lesion. Sometimes these lesions are multiple. (Figs. 18, 19)

**Thrombosed angioma**

Haemangiomas may be very dark red or black and therefore can cause concern because of the depth of pigment. The surface is usually shiny and smooth and there is a sharp cut off between the lesion and surrounding normal skin (Figs. 20, 21). Sometimes small capillaries can however be seen in this area. This is a lesion in which the use of the dermatoscope is of great value as usually the fact that the pigment is altered blood rather than melanin becomes apparent with use of the dermatoscope.

**Pyogenic granuloma**

Pyogenic granulomas usually grow extremely rapidly and are moist vascular lesions. The rate of growth over a period of days or weeks, is much faster than that for nodular melanoma, and the site distribution is usually rather different. The majority of pyogenic granulomas occur on the fingers. (Fig. 22)

**Dermatofibroma (Alternative names: histiocytoma cutis, sclerosing angioma)**

Dermatofibromas are most often found on the limbs. They are firm lesions which usually have a yellowy brown tinge with poor demarcation between normal skin and the individual lesion (Fig. 23). The bulk of the lesion is situated deeply in the dermis.
Fig. 16 - Black cerebriform elevated skin lesion of the trunk, with relatively regular margins and "stuck-on" appearance.

**Histology:** Pigmented seborrhoeic keratosis.

Fig. 17 - Brown elevated skin lesion of the back with regular margins and crusted appearance.

**Histology:** Seborrhoeic keratosis.

Fig. 18 - Upper back, basal cell carcinoma (5 x 3.5 cm) with outer ring and islands of bluish pigmentation. Marginal ulcerated areas and telangiectases (just visible on left edge). The clinical diagnosis could not exclude that this lesion was a regressed melanoma. It was removed with 3 mm margin.

**Histology:** Pigmented basal cell carcinoma.

Fig. 19 - Irregular, reddish-brown lesion of the back with darker and crusted areas. An excision with 3 mm margins is sufficient to cure basal cell carcinoma and to resolve a suspicion of melanoma.

**Histology:** Superficial basal cell carcinoma.
Fig. 20 - Shiny black lesion of the back with surrounding erythema. Although the clinical diagnosis is almost certainly benign, there is some doubt because of the dark coloration. **Histology:** Angioma.

Fig. 21 - Shiny black lesion of the neck with prominent elevations. Although the clinical diagnosis is almost certainly benign, there is some doubt because of the dark coloration. **Histology:** Angioma.

Fig. 22 - Pyogenic granuloma. In the absence of a clear case history, clinical differentiation of this lesion from achromic melanoma can be extremely difficult. It is usually excised for histological confirmation.

Fig. 23 - Elevated regular lesion on thigh, poorly demarcated from surrounding skin. Pigmentation darker than normal skin. **Histology:** Dermatofibroma.
Thin or early Melanoma

Thin melanoma for the purpose of this paper is defined as melanoma less than 1mm thick. While the majority of thin melanomas are small (Figs. 24-33) with a diameter even less than 6-8mm, some melanomas, particularly of the lentigo melanoma type may have a relatively large surface area. (Fig. 2)

Thin melanomas are usually flat asymptomatic lesions. A high proportion of thin melanomas are found incidentally in the course of the patient being examined for other medical care such as blood pressure check or by a member of the family. In a recent study as many as 23% of all melanomas were first identified by a family member. The features which are of value in making the diagnosis of thin melanoma are:

- the presence of a new or growing or changing pigmented lesion on the patient's skin.
- as with more advanced melanomas, the outline of the lesion may be irregular, and the pigmentation within the lesion may show varying shades of brown, black and grey.

At the present time it is believed that a higher proportion of thin melanomas arise on the basis of pre-existing naevi (Figs. 34 - 36) than is the case with thicker melanomas, but this may be due to the fact that the evidence of a pre-existing naevus has been destroyed during the evolution of the thicker tumours.
Fig. 24 - Reddish-brown to black unevenly coloured irregular lesion arising on back of 34-year-old man, roughening and accentuation of skin margins. **Histology:** melanoma in situ + dermal naevus.

Fig. 25 - Reddish-brown to black unevenly coloured irregular lesion arising on trunk. **Histology:** superficial spreading melanoma 0.66 mm thick.

Fig. 26 - Reddish-brown to black unevenly coloured irregular lesion arising on trunk. **Histology:** superficial spreading melanoma 0.9 mm thick.

Fig. 27 - Reddish-brown to black unevenly coloured irregular lesion arising on trunk. **Histology:** superficial spreading melanoma <0.75 mm thick.
Fig. 28 - Reddish-brown to black unevenly coloured irregular lesion arising on back. 
**Histology:** melanoma 0.44 mm thick.

Fig. 29 - Reddish-brown to black unevenly coloured irregular lesion arising on left leg, slight accentuation of skin margins. 
**Histology:** superficial spreading melanoma 0.10 mm thick. Level II, with regression.

Fig. 30 - Reddish-brown and black skin lesion of the trunk, 1 centimeter in diameter. 
The clinical diagnosis was uncertain. The lesion was excised with 3 mm margins for histological examination. 
**Histology:** Superficial spreading melanoma 0.73 mm thick.

Fig. 31 - Male aged 50 with a superficial spreading melanoma on back. The lesion has invaded to Clark level II and has a Breslow thickness of 0.5 mm.
Fig. 32 - Reddish-brown to black unevenly coloured irregular lesion arising on periauricular.
**Histology:** Lentigo maligna.

Fig. 33 - Female aged 37. Lesion on thigh. Superficial spreading malignant melanoma which has invaded to Clark level III and is 0.52 mm thick.

Fig. 34 - Black and brown indented lesion of the back (19x9 mm) with ill defined margins, contiguous with red, elevated, more regular lesion. A good example of an elevated melanoma arising in contiguity with benign naevus.
**Histology:** Cutaneous melanoma, Clark level II, 0.67 mm thick associated with compound naevus.

Fig. 35 - Black indented elevated lesion of the back with well defined margins, contiguous with brown, more regular lesion, also elevated. Congenital naevus 0.9 cm in diameter; SSM 1.2 cm in diameter. An example of an elevated melanoma arising in contiguity with benign naevus.
**Histology:** Superficial spreading melanoma, Clark level II, 0.9 mm thick, associated with congenital dermal naevus.

Fig. 36 - Thin flat lesion of the back, irregularly shaped and pigmented, arising in contiguity with smaller raised red lesion. A good example of an impalpable thin melanoma arising in contiguity with benign naevus.
**Histology:** Superficial spreading melanoma, Clark level II, 0.8 mm thick associated with dermal naevus.
Differential diagnosis of thin Melanomas

The most important items here are:

- Benign pigmented naevi (Pigmented moles)
- Lentigos
- Superficial basal cell carcinoma

Benign pigmented naevi

The differentiation at the clinical level between thin early melanoma and a benign pigmented naevus can at times be very difficult. However, the majority of benign pigmented naevi have a round or oval outline which is regular, and are composed of a single shade of pigment with little irregularity (Figs. 37-55). Some early melanomas show some inflammation within the lesion, and this is not usually seen in non-traumatised benign pigmented naevi.

The blue naevus is a type of naevus which may cause some confusion with nodular melanoma because of its deep colour (Figs. 56-58). Blue naevi may be present from birth, or may first appear around puberty. They are characterised by the presence of deeply set pigment producing cells in the dermis, and are clinically seen as smooth regular blue or blue grey lesions. They are commonly seen on the face, the wrists and the buttocks, and may require an excisional biopsy.
Fig. 37 - Regular, uniformly black, elevated lesion of the leg with marked cutaneous solci. Note the indistinct edges and the regular form.  
**Histology:** Compound naevus.

Fig. 38 - Regular, uniformly black, elevated lesion of the back with marked cutaneous solci. Note the indistinct edges and the regular form.  
**Histology:** Compound naevus.

Fig. 39 - Predominantly brown elevated lesion of the breast with regular outline containing smaller darkly pigmented areas. To be safe this lesion should be excised.  
**Histology:** Compound naevus.

Fig. 40 - Brown lesion of the abdomen of 1.5 cm in greatest diameter, peppered with melanic spots. Note indistinct margins and contiguous papule. The presence of the dark spot leaves some doubt and to be safe this lesion should be excised.  
**Histology:** Compound naevus.
Fig. 41 - Contiguous lesions of the back with uniform pigmentation and fairly regular outlines. Note the indistinct margins and the regular forms which suggest benignity.

_Histology:_ Melanocytic naevus.

Fig. 42 - Fairly irregular shaped, uniformly-pigmented brown lesion arising on a child's breast. Note not clearly defined edges. Melanoma is very rare in children.

_Histology:_ Melanocytic benign naevus.

Fig. 43 - Dark brown rhomboid lesion of the foot with ill-defined edges.

_Histology:_ Junctional naevus.

Fig. 44 - Black and brown lesion of the breast. Less than 6 mm in diameter with fairly regular circular outline and not well-defined edge. The clinical evidence is that this lesion is benign, but this patient has already had a melanoma removed.

_Histology:_ Compound naevus.
Fig. 45 - Somewhat irregular oval-outlined black and brown lesion arising on abdomen. Although regular in outline, the variable pigmentation suggests removal of this lesion. **Histology:** Compound naevus consistent with dysplastic naevus.

Fig. 46 - Circular light-brown lesion containing darker area on left thigh of 11-year-old girl. The size is approximately 5 mm diameter. Notwithstanding the presence of a dark pattern, the regularity of the shape and margin are typical signs of benignity. **Histology:** Dermal naevus.

Fig. 47 - Uniformly dark-coloured lesion on the right side of trunk. The lesion's small size (3x2 mm) and uniform pigmentation are typical signs of benignity. **Histology:** Junctional naevus.

Fig. 48 - Regular oval lesion of the back with typical "fried egg" appearance and indistinct borders. These characteristics indicate a diagnosis of dysplastic naevus. **Histology:** Dysplastic naevus.
Fig. 49 - Rectangular-oval, reddish-brown, partially raised lesion on anterior thigh, with well defined edges. The pink coloration and the form suggest a diagnosis of dysplastic naevus.

**Histology:** Dysplastic naevus.

Fig. 50 - Red elevated lesion on the arm with halo of erythema and indistinct margins.

**Histology:** Spitz naevus.

Fig. 51 - Elevated, circular uniformly red lesion arising on a child's face. This lesion does not need histological examination.

**Histology:** Spitz naevus.

Fig. 52 - Hairy pigmented, large size lesion on back of hand. Note uniformity of the coloration and fairly regular form.

**Histology:** Congenital naevus.
Fig. 53 - Large, oval, hairy, brown lesion peppered with darker spots. Note distinct margins. 
**Histology:** Congenital naevus.

Fig. 54 - Irregular, darkly pigmented mostly flat lesion on hand. Note indistinct margins. Some authorities report that lesions like this can degenerate into melanomas; but the frequency is unknown and the management controversial. 
**Histology:** Congenital naevus.

Fig. 55 - Irregularly shaped lesion. Note peppered variation of pigmentation and well-defined edges. Some authorities report that lesions like this can degenerate into melanomas; but the frequency is unknown and the management controversial. 
**Histology:** Congenital naevus.

Fig. 56 - Raised circular node on the back of the hand with indistinct margins, shiny appearance and deep blue pigmentation. This lesion does not need histological examination. 
**Histology:** Blue naevus.
Fig. 57 - Regular raised oval plaque with non uniform predominantly deep blue pigmentation, ill-defined edges and accentuated skin markings. 

*Histology:* Blue naevus.

Fig. 58 - Very dark bluish-black elevated lesion on the foot with well defined edges in places and relatively regular form. Most of the characteristics of this lesion point to it being benign. However the black colour leaves some doubt and it should be excised for histological examination.

*Histology:* Blue naevus.
Actinic or Senile Lentigo

These flat or macular lesions are commoner on sun-exposed skin of older individuals (Fig. 59). The tendency to develop these frecklelike lesions is also commoner in those with red hair and blue eyes. The lesions are of pale sandy brown with an irregular outline which fade into the surrounding skin. They may become pale during the winter months but rapidly become much darker with sun exposure.

Superficial Basal Cell Carcinoma

While superficial basal cell carcinomas are rarely a cause of confusion with melanoma, on occasion basal cell carcinomas may be pigmented and these can be difficult to distinguish (Fig. 60). A very useful point of discrimination is the raised rather rolled border which is associated with the basal cell carcinoma. This can be both seen and felt if the lesion is palpated.

Fig. 59 - Actinic or senile lentigo. Flat lesion on the face of male aged 65.

Fig. 60 - Irregularly outlined, darkly but non-uniformly pigmented lesion on lower back. Note black pearls ringing a central depigmented and erythematous area. An excision with 3 mm margins is sufficient to cure basal cell carcinoma and to resolve a suspicion of melanoma.

Histology: Superficial pigmented and plurifocal basal cell carcinoma.
Ancillary methods to aid in clinical diagnosis of Melanoma

At present there are two main methods undergoing developmental assessment. These involve the use of image analysers to analyse the individual clinical features of pigmented lesions and the use of the dermatoscope or skin surface microscopy.

Skin surface microscopy (Dermatoscopy, Epiluminescence)

The principle behind this technique is the examination of the pigmented lesion in vivo on the body surface at moderate magnifications of x10-x40, using oil to render the surface epidermis translucent. Machines which can be used for this technique range from the expensive and bulky operation microscope, to the small handheld dermatoscope. Using these techniques, a number of workers have developed an atlas of signs which can be seen in pigmented lesions such as pigment dots, pigment globules, milky veils etc., and have identified certain of these features which are commoner in early melanoma than benign pigmented lesions. At the present time there is no definitive study showing total sensitivity or specificity for any one of these skin surface features, but there is no doubt that it is relatively easy to differentiate non-melanocytic lesions from melanocytic by this technique. For example angiomas are easily identified and separated with skin surface microscopy. However, it at present less easy to separate early melanoma from benign naevi, and further results are awaited.
Image analysis

The basic principle behind the technique of image analysis is to record by computer the clinical features of a specific pigmented lesion and then to analyse it carefully with regard to individual features of the lesion such as symmetry, irregularity of outline, depth of colour, component of basic hues contributing to the overall colour of the lesion etc. A number of these systems are currently under evaluation, and it is likely that within the next few years these may be available to assist both specialists and family doctors in making important decisions about management of pigmented lesions.

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