

Melanoma in black South Africans

There are distinct differences in malignant melanoma between black and white populations regarding the incidence, anatomical distribution, histogenetic types of melanoma, stage at presentation and prognosis. Several of these aspects have been addressed both by Lodder and colleagues¹ in this issue of the journal and by other authors who have reported melanoma data from southern Africa.²⁻¹⁶ While there has been an inexorable increase worldwide in the incidence of cutaneous malignant melanoma among white population groups,¹⁷ the incidence of melanoma in black and Asian populations remains low compared with Western series.¹⁸ In a worldwide study evaluating 59 population-based carcinoma registries, Crombie reported a three-times greater melanoma incidence in white compared with black populations.¹⁹ Melanoma in the African-American population is reported to be 20 times less common than in American white population groups. In South Africa, the incidence of melanoma in the black population is 0.9 per 100 000, which is 15 times less than in the white population. In fair or light-skinned Celtic populations, more than 90% of melanomas occur in sun-exposed skin, whereas 60% of melanomas among Africans arise in non-sun-exposed skin, involving, in particular, plantar, palmar, subungual and mucosal surfaces.^{4,5} The volar and subungual areas are the most common anatomical sites of malignant melanoma in black populations, with 70% of melanomas found on the lower limb and 90% of melanomas on the leg occurring below the ankle.³

Acral lentiginous melanoma is the most common histogenetic type and accounts for 75% of all melanomas found in the black population.^{4,5,20,21} Acral lentiginous melanomas typically occur on body sites protected from sunburn by a thick keratin layer and are particularly common in the plantar and subungual surfaces, accounting for most of the melanomas in these anatomical areas.²⁰ Plantar melanomas in the black population are usually heavily pigmented, and ulceration and fungation occur in advanced lesions.⁴ Plantar acral lentiginous melanomas in black patients tend to be large in diameter, with a mean surface area of more than 12 cm², which has important implications for treatment.^{4,5,20,21} Nodular and superficial spreading melanomas occur less commonly in the black population, and lentigo maligna melanoma is rare.³ Patients with acral lentiginous melanoma have a poorer prognosis when compared with those with other subtypes of melanoma, specifically superficial spreading and lentigo maligna melanoma, primarily owing to the diagnosis of acral lentiginous melanoma at a later stage.²¹

Subungual melanoma accounts for 10% of melanoma in black populations and has an equal distribution on the hand and foot.²² Subungual melanoma usually begins as a pigmented linear streak in the nail bed and, in the early stages, has a benign appearance and is symptomless.²³ Often, attention is drawn to the lesion only after an injury. Involvement of the eponychium and paronychia is common

with advanced disease. When left untreated, the nail becomes thickened, deformed and split, and tumour may extrude through the nail plate. Ulceration, secondary infection and bleeding are common at this late stage. One-third of subungual melanomas are either amelanotic or have minimal pigmentation, making diagnosis particularly difficult.²² The clinical differential diagnosis covers a wide spectrum which includes subungual haematoma, pyogenic granuloma, chronic paronychia, bacterial and fungal infections, junctional naevi and rare vascular tumours.²²⁻²⁴

Two features which lead to suspicion of subungual melanoma are the associated pigmentation of the adjacent nail fold (Hutchinson's sign) and progressive elevation of the nail from the nail bed.²³ Distal migration of pigment away from the nail bed helps to distinguish melanoma from subungual haematoma.²² Subungual melanotic bands unrelated to malignant melanoma are common in black patients, but rare in whites. Because of the difficulty in diagnosis, clinical awareness and early biopsy are essential in suspicious or persisting lesions of the nail, whether the abnormality is pigmented or not. A generous biopsy is mandatory to obtain satisfactory diagnostic material, and should include a portion of the proximal terminus of the nail matrix, the nail bed and the nail plate.^{22,23} If the initial biopsy is inconclusive, more tissue should be taken. All pigmented subungual lesions should be considered to be melanoma until proved otherwise by histological examination of adequate biopsy material.²³

Mucosal melanoma, not limited to any specific mucosal surface, accounts for 10% of melanomas in black patients, which is substantially more than that reported for whites.³ The increased prevalence of mucosal melanoma in black patients is due to areas of pigmentation in the mucous membranes, in particular involving the mucosa of the lip, nose, palate and vulva.^{3,25} Mucosal melanomas tend to spread radially and involve large areas of mucosa. Most patients present with extensive local disease, and complete resection of the primary mucosal lesion is seldom possible. Despite advanced local disease, nodal metastases occur less often than with cutaneous melanoma, and less than 50% of patients present with regional lymphadenopathy. Irrespective of the mucosal site, these tumours are associated with a poor prognosis.²⁶

Surgery is the mainstay of melanoma therapy at all sites.²⁶ Excision biopsy of the primary lesion is essential to confirm the diagnosis and provide histological microstaging information that guides further surgical strategy.²⁶ A tridimensional excision biopsy should be performed with a margin of 3 mm beyond the extent of the lesion. The excision should be elliptical in shape in the direction of Langer's lines to allow tension-free closure. The biopsy must include underlying subcutaneous fat so that complete histological data can be assessed.²⁶ In situations where the size of the primary lesion prevents a diagnostic excision

biopsy, an incision biopsy of a representative area of the lesion is acceptable. The pathology report should include information about the Breslow thickness in millimetres, presence of ulceration, mitotic index, Clark level, lateral and deep margin size in millimetres, and the presence of local metastases.²¹ The mitotic index is the third most important independent prognostic factor and has been introduced in the new American Joint Committee on Cancer (AJCC) staging system as a reporting standard.²⁶ The presence of tumour regression, tumour-infiltrating lymphocytes, vertical growth phase, angiolymphatic invasion, neurotropism and histologic subtype are also of value. Recent molecular advances in determining prognosis in acral lentiginous melanoma include increased expression of c-myc oncogene activity,²⁷ increased p53 protein expression,²⁸ strong c-kit positivity in the basal epidermal cell layer²⁹ and characteristic chromosomal amplification.³⁰

Wide local excision is the treatment of choice for cutaneous melanoma.²⁶ Several factors must be considered before the extent of treatment is decided. The most important criteria are the pathologist's measurements of the tumour thickness and level of invasion. Most experts recommend a 10 mm margin of normal skin for every 1 mm depth of invasion as determined histologically, with a 3 cm margin adequate for lesions 3 mm or deeper. Where anatomical constraints are relevant (for example, in melanomas on the face and ear), lesser margins can be used.³¹⁻³³ Primary closure of the excision is the method of choice.²⁶ Where primary closure is not technically possible, a rotation flap or split skin graft can be used. For subungual melanoma, amputation at the metatarsophalangeal or metacarpophalangeal joint is the optimal treatment.^{22,23} In the sole of the foot, a large surface area of excision is required to achieve adequate local clearance, and the size of the defect may present a difficult problem for the reconstructive surgeon.³⁴ Split-skin grafting generally provides effective cover, and patients are able to walk on the graft site without difficulty. Satisfactory functional results with split-skin graft, even on pressure areas of the ball and heel, are obtained. Some patients may, however, develop hyperkeratosis or fissuring of adjacent pressure-bearing areas, which usually respond to special footwear.³⁴

In many black patients, plantar melanoma is advanced at the time of presentation but, despite this, amputation is seldom necessary, especially with improvements in non-ablative therapy.^{3,4} When combined with operative excision, isolated limb perfusion with melphalan is effective in patients with plantar and subungual melanoma; when performed in centres of expertise, there is minimal morbidity.³⁵ Lymphoscintigraphy and sentinel node biopsy have replaced prophylactic or elective lymph node dissection in patients who have intermediate- or high-risk primary tumour and clinically uninvolved regional nodes, so decreasing the morbidity associated with regional lymphadenectomy.²⁶ Although controversy still exists as to whether or not sentinel lymph node biopsy alters a patient's prognosis, it has been shown to be a powerful prognostic indicator.²⁶ Therapeutic lymph node dissection is reserved for patients with clinically involved regional nodes, either during excision of the primary lesion and, subsequently, if the nodes become enlarged and suspicious during follow-up.²⁶

Delay in seeking medical care in patients with symptoms of carcinoma is an important determinant of survival.³⁵

Many black patients unfortunately present with advanced disease.³ The major component of delay in black patients is patient-related. Studies from Africa have documented a substantial delay in presentation for both plantar and subungual melanoma. The plantar surface is often covered and overlooked by both patient and physician. Early subungual melanoma is difficult to detect, and is often confused with other benign lesions. More than one-third of black patients with melanoma present with nodal disease, and 15% have disseminated metastatic disease at the time of initial presentation.³ Experience in Australia and the UK has demonstrated that sustained professional and public education programmes focusing on skin tumours can substantially reduce mortality from melanoma by detecting the disease early, and increasing the proportion of thin to thick melanoma at presentation.³⁶

Melanoma in the black population has been generally regarded in the past as an aggressive disease, with reported 5-year survival rates of less than 25%.³ Recent data, however, have challenged the opinion that race is the significant prognostic factor.^{3,4} The poor prognosis in black patients may be the result of the cumulative effect of multiple negative prognostic factors, the most important of which are thick primary lesions and presentation with advanced disease.³ Less than half of black patients present with stage 1 disease.³ In addition, a number of other negative prognostic factors are present, which translates into reduced survival; these include unfavourable subungual, plantar and mucosal primary sites and a disproportionate preponderance of acral lentiginous melanoma.^{3-5,22,23} In the USA, there has been a recent beneficial trend, with black patients presenting with less invasive primary lesions and at an earlier stage of disease, resulting in better survival. Improved public health education programmes and earlier diagnosis should reduce the mortality associated with malignant melanoma in the black population in Africa, as has occurred in the USA.^{36,37}

J. E. J. Krige

Department of Surgery
Faculty of Health Sciences
University of Cape Town

REFERENCES

- Lodder JV, Simson W, Becker PJ. Malignant melanoma of the skin in black South Africans: A 15-year experience. *S Afr J Surg* 2010; 48(3):
- Swan MC, Hudson DA. Malignant melanoma in South Africans of mixed ancestry: a retrospective analysis. *Melanoma Res* 2003; 13: 415-419.
- Hudson DA, Krige JE. Melanoma in black South Africans. *J Am Coll Surg* 1995; 180: 65-71.
- Hudson DA, Krige JE. Plantar melanoma in black South Africans. *Br J Surg* 1993; 80: 992-994.
- Isaacson C, Spector I. Malignant melanomas in the Eur-African-Malay population of South Africa. *Am J Dermatopathol* 1987; 9: 109-110.
- Rippey JJ, Rippey E. Epidemiology of malignant melanoma of the skin in South Africa. *S Afr Med J* 1984; 65: 595-598.
- Rippey JJ, Rippey E. The presentation of malignant melanoma. *S Afr Med J* 1979; 56: 99-100.
- Isaacson C. Cancer of the skin in urban blacks of South Africa. *Br J Dermatol* 1979; 100: 347-350.
- Whiting DA. Skin tumours in White South Africans. Part III. Distribution of skin tumours on the body. *S Afr Med J* 1978; 53: 134-136.
- Rippey JJ, Rippey E. Malignant melanoma of the skin in Johannesburg Whites. *S Afr Med J* 1977; 52: 720-723.
- Rippey JJ, Rippey E. Malignant melanoma with adjacent Hutchinson's melanotic freckle in Black Africans. *Pathology* 1977; 9: 105-109.
- Rippey JJ, Rippey E, Giraud RM. Pathology of malignant melanoma of the skin in Black Africans. *S Afr Med J* 1975; 49: 789-792.

continued on page 99