

Looking for Melanoma

by Joseph L. Pace

Melanoma is increasing worldwide and UK death rates from melanoma have more than doubled from 1.2 per 100,000 in 1971 to 2.6 per 100,000 in 2007. Cancer Research UK predicts that by 2024, rates of malignant melanoma in people aged 60 to 79 will rise by a third.

Genetic factors are the most important of the known risk factors, including the familial tendency to develop melanoma, prominent moles, and atypical moles. Overexposure to ultraviolet radiation in sunlight is believed to be a contributing factor to some cases of melanoma; short periods of intense exposure, such as sunbathing is associated with a 2-fold increase in melanoma risk. Indeed, both cheaper package holidays to sunny destinations and the excessive use of sunbeds from the 1970's are said to be related to increased melanoma risk.

Malta has not been spared and in the decade between 1998 and 2008 reported cases trebled from just under 20 to 60 per annum. Some of these will be due to increased awareness among both doctors and public and many will be curable melanomas in situ, but nevertheless this increase is

in keeping with the experience of other countries. The outcome in each case depends on the extent of the lesion in particular the depth of skin affected. When melanoma is detected at its early stage, simple surgical removal cures the disease in most cases, but when spread to lymph nodes, the 5-year survival rate is 30-40%, falling to a dismal 12% with spread to distant organs. Thin melanomas therefore have an excellent prognosis, unlike thicker lesions.

With the realisation that for cases with metastases there is relatively little available in the way of consistently successful therapy, the onus is on the dermatologist to make a crucial early diagnosis when cure becomes the rule and not the exception.

According to The Melanoma Letter, a publication of the Skin Cancer Foundation, a dermatologist using a quality hand lens will only make a correct diagnosis in 65% of cases. The arrival of the dermoscopy technique (surface microscopy) which utilises a microscope to identify characteristic melanoma patterns not otherwise visible was a major landmark enabling the experienced dermatologist to



diagnose melanoma earlier and thus make it more amenable to curative treatment. In addition, the number of innocent moles removed "just in case" was expected to diminish resulting in less morbidity and more cost effectiveness. It was however realised early on that Dermoscopy (also known as Epiluminescence Microscopy, ELM) would enable a trained dermoscopist to achieve >80% correct diagnosis but that casual dermoscopy can degrade diagnostic accuracy.

Amid rising melanoma rates and with less than 20% of US dermatologists confident with dermoscopy, attention was turned to the possible use of computerised systems to make the benefits of dermoscopy even better and available to dermatologists who are not experienced dermoscopists.

The technology has evolved rapidly in recent years with major research centres such as the renowned Sydney Melanoma Diagnostic Centre placing Automated diagnosis of melanoma on the skin in the forefront of their current major research programmes.

The approach developed is an image-analysis system of computerised (digital) dermoscopy images. These are displayed so that analysis of a 'mole-like lesion' can be compared with a large database of previously analysed melanomas and benign moles. This approach, initially conceived to help dermatologists not fully expert in dermoscopy, has now been repeatedly demonstrated to achieve a comparable or superior diagnosis to that of a range of clinician groups, including the acknowledged experts in the field.

There are a number of different computerised digital dermoscopy applications, all successful in their own way. One of the more advanced systems is the DB-Dermo MIPS developed in Siena by Dellaera and Burroni, the latter holding a Chair at the University of Siena, dedicated solely to the computerised diagnosis of melanoma. Publications have confirmed that the inspection of pigmented skin lesions by digital epiluminescence has a better diagnostic accuracy than that of a trained dermatologist using the epiluminescence technique only, and that this computerized system can play an essential role in the detection of early melanomas.¹ The same research group later showed that computerized analysis of digital images obtained by epiluminescence light microscopy evaluated 48 objective parameters used to train an artificial neural network (compared to 5-7 parameters analysed by the dermatoscope alone) and obtained a maximum accuracy in distinguishing

melanoma from benign lesions of about 93%. It was also independently confirmed that a diagnostic algorithm for digital image analysis of melanocytic lesions can achieve the same range of diagnostic accuracy as the application of dermoscopic classification rules by experts.² Differentiation of small melanomas from small benign pigmented lesions challenges even expert physicians. Computer-vision systems can facilitate early detection of small melanomas and may limit the number of biopsies to rule out melanoma performed on benign lesions.³

Computerised digital dermoscopy is now increasingly being utilised to supplement the dermatologist's clinical acumen and improve outcomes for patients with melanoma by providing an early diagnosis. A secondary beneficial effect is reduction of need of excision and pathological examination of benign lesions. The technology available

In Malta is the DB-Dermo MIPS and this highly efficient system is set at a sensitivity level that will also give a warning result (and hence notice to excise) to a small number of benign lesions that do not satisfy all or almost all of the 48 parameters examined.

This system has been in use in a number of countries for some years with excellent results. Computerised digital dermoscopy like all sophisticated diagnostic systems in other fields of medicine, is NOT for mass screening purposes but rather to help the dermatologist look for melanoma in persons considered to be at higher risk, as well as to support the clinical ELM diagnosis in individual cases. These higher risk cases which merit at least 2-yearly examinations include: (1) when there is a personal / family history of melanoma (annually for this group); (2) when there are numerous dysplastic (atypical) naevi; (3) when the skin is light-colored and heavily freckled due to excessive sun exposure and/or Ultraviolet radiation from sunlamps and sunbeds; and (4) Post organ transplant patients. In addition, a one-time total-body skin exam to hunt for melanoma in patients who are older than 50 is considered as cost-effective as other widely accepted cancer screenings such as mammograms and Pap smears⁴ while the American Cancer Society recommends having a complete skin exam every year if you're older than 40. These screening exams involve a head-to-toe inspection of your skin by a dermatologist.

Single lesions that exhibit recent changes will ordinarily be removed and examined unless clinical examination and ELM confirms a benign condition such as a pigmented seborrheic keratosis. Digital dermoscopy can help to confirm a diagnosis which may not yet be totally clear.

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References

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NOTE-This digitalised dermoscopy computer system has been up and running for some time with highly satisfying results. To strongly support and compliment the initiative of the The Maltese Association of Dermatology and Venereology in the sphere of melanoma prevention with the annual Melanoma Monday campaign, it has been decided to emphasise this important health message on a continuing basis by offering a number of free DB-Dermo MIPS examinations, where indicated on one day each month throughout 2010. Patients will be referred by their family doctors as explained above and should be limited to those at higher risk. It is important that only those in these risk groups are referred since slots are of course limited. This programme is being held with the generous support of the Chemmart Group, owners of the DB-Dermo MIPS system in Malta, and of a number of dermatologists who will give their time gratuitously. Colleagues are of course welcome to visit and see DB-MIPS - please email us on mpl@