Evaluating methods for detecting deadly skin cancers

Melanoma is a rare, but potentially deadly, type of skin cancer that develops in skin cells called melanocytes, which are responsible for producing the pigment in your skin. According to the American Cancer Society, the probability of developing melanoma from birth to death in the U.S. is now estimated to be 1 in 34 in men and 1 in 53 in women.

Skin cancer screening, or early detection, is key to catching melanoma before it spreads. The detection and removal of melanoma before it has metastasized, or spread to other areas of the body, dramatically improves whether a patient will survive this disease. If detected early, melanoma is usually survivable, whereas late detection is usually life-threatening and costly. Six independent studies of the cost of melanoma treatment in the U.S. conclude that the direct cost of melanoma care increases with increasing stage of disease, further illustrating the need for effective early detection.

A team led by Sancy Leachman, M.D., Ph.D., chair of the Department of Dermatology in the OHSU School of Medicine and director of the OHSU Knight Cancer Institute's Melanoma Research Program, sought to evaluate melanoma screening approaches, as well as logistical clinical issues to keep in mind when evaluating screening options.

Current strategies for melanoma screening generally occurs in two venues—clinic-based (performed by dermatologists or primary care physicians) or mass screening, often led by the American Academy of Dermatology or similar organizations such as Euromelanoma in Europe. A third form of melanoma screening that has recently emerged combines screening and educational awareness, including publicity on behavioral risks, like outdoor tanning and the use of tanning beds, and training of physicians in behavior modification skills. In addition, skin self-examination remains an important step in the detection continuum.

Technology plays a key role in the advancement of early detection methods. This paper evaluates

various high-tech devices that can be used to detect malignant features of melanocytic lesions, including a process called in vivo confocal microscopy which is likened to an “optical biopsy.” Traditionally, worrisome skin lesions are removed with a skin biopsy and then evaluated under a microscope, but this optical biopsy technique uses a painless laser to analyze the skin tissue so that a biopsy does not need to be performed. Sometimes melanoma is very difficult to diagnose under a microscope. So, this paper also discusses several molecular studies, including CHG, FISH, and qRT-PCR, which can be used to detect problems within the DNA in skin cells that indicate cancerous cells.

The advance of technology will continue to allow melanoma early detection methods and technologies to become increasingly available. However, one of the key challenges physicians face in clinics is integrating newer methods into “tried and true” current practices. The authors outline a realistic approach on the utility of these methods in the context of patient care. That realistic approach aims to maximize the strengths of the various technologies and methods. In order to be effective, a pragmatic approach must take into consideration logistical clinical issues related to the time, equipment, and expertise requirements for each technology as well as the cost and convenience for the patient.

It’s important to note that some forms of rapidly progressive melanoma are unlikely to be detectable prior to metastasis, including aggressive nodular melanomas. However, on the whole, successful application of early detection technologies has enormous potential to save lives and reduce the costs associated with melanoma treatment. Leachman and team surmise that perhaps as never before, through the development of a comprehensive strategy to detect melanoma early, we have the opportunity to reduce suffering secondary to melanoma.

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Publication

Methods of Melanoma Detection.
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