Melanoma Screening and MelaFind

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Abstract—MelaFind is a screening device that was created to provide additional information about abnormal skin lesions. It is used by dermatologists to provide a more informed decision as to whether or not a biopsy should be performed. The device does this by emitting, receiving, and then analyzing waves of light.

I. INTRODUCTION

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elanoma is the deadliest form of skin cancer, responsible for approximately 75% of skin cancer fatalities” (About MelaFind®). Cancer is caused by abnormal cells dividing and growing with no restraint. Normal body cells grow and divide to replace the ones that die, but damage to their DNA causes issues to arise. If a cell isn’t directed by its DNA “instructions” it will continue to grow and form more of these cells. When this happens these cells begin to invade other tissues and generally form tumors. The American Cancer Society also estimated 76,690 diagnoses and 9,480 deaths from melanoma in the U.S. this year. One of the worst facts about these statistics is that “melanoma is virtually 100% curable if detected when it is confined to the epidermis” (Gutkowicz-Krusin). This type of information is horrifying but it also led to a potential solution. MelaFind® was created to screen for abnormal skin lesions to potentially discover skin cancers before they became fatal. Dermatologists, or skin doctors, have training in identifying these atypical lesions. Generally they use medical history, an exam of the body and lesion, dermatoscopy, and as a last result biopsy. Occasionally dermatologists can’t justly perform a biopsy or ignoring a lesion even with all this information. As a result, “MelaFind® was designed to be used when a dermatologist chooses to obtain additional information for a decision to biopsy” (About MelaFind®).

II. METHODS

MelaFind® consists of an illuminator, a lens system and a photon sensor. To analyze the lesions it emits 10 different wavelengths of light from its illuminator and “creates multi-spectral data of the light scattered back from the lesions” (About MelaFind®). It then uses algorithms to automatically analyze the data and compares it back to a database with results from over 10,000 biopsied lesions. There are, however, certain conditions for using MelaFind®. On their main website it specifically states: It should be used on lesions “with a diameter between 2 mm and 22 mm, lesions that are accessible by the Hand-Held component of MelaFind®, lesions that are sufficiently pigmented..., lesions that do not contain a scar or fibrosis consistent with previous trauma, lesions where the skin is intact..., lesions greater than 1 cm away from the eye, lesions which do not contain foreign matter, and lesions not on special anatomic site” (MelaFind).

III. RESULTS

According to Dina Gutkowicz-Krusin, the pivotal trial of MelaFind had 1632 lesions available for analysis. In the study it identified 175 to be potentially positive. “The biopsy sensitivity of MelaFind® was 98.3% (172/175) which met the study endpoint for sensitivity” (MelaFind®). In the final results it only missed 3 cases of melanoma showing great promise. In addition, the device discovered 10.8% of the false lesions while the dermatologists in the study only found 5.6%. This shows that MelaFind® generally has a better chance at finding false positives when compared to a specialist. In addition, there are no known side effects for using the device.

IV. DISCUSSION

Overall MelaFind® is a major improvement in skin cancer identification. This device has shown higher results, when analyzing atypical skin lesions, than the specialists in this field. It shows no adverse side effects and the only major disadvantage are the stipulations for using the device. It will also save money for patients if it discovers false positives during a dermatologist’s evaluation. In addition, the device is relatively inexpensive when compared to most medical devices. According to Emily Greenhalgh, Mela Sciences CEO Dr. Joseph Gulfo stated that the device will “cost $7,500 (including placement and training fees) and a patient use fee of $50” (¶1). In the future, as its technology improves, it could become more influential in determining patient procedures as well.

REFERENCES