MELANOMA

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What is it?

Melanoma develops in the cells (melanocytes) that produce melanin. When melanocytes are exposed to UV radiation, such as sunlight, they make more pigment, causing the skin to darken or tan. Melanoma can develop either from an existing mole or appear as a new mole when the melanocytes become malignant (Negin et al., 2003). Melanoma starts when healthy melanocytes change and grow out of control, developing into a cancerous tumour. A cancerous tumour is malignant; therefore, it can develop, grow and spread to other body parts. In addition, melanoma can develop from a normal mole already existing in someone's skin. In such a case, the mole will undergo changes in shape, size, color, or the mole border that are usually visible.

Functions of the skin

Naturally, skin cells develop in an orderly and controlled manner. New healthy cells push older cells toward your skin's surface, where they eventually and slough off. Melanocytes are cells of neural crest origin. They are specialized melanin-producing cells found in the basal layer of the epidermis. Although melanocytes retain a large part of the melanin produced, they also secrete it to absorb the surrounding cells (Quintana et al., 2008). The main body is part of the basal epidermis; it is one cell thick but has extensions that branch into the "spikey cell layer" on top to help the melanin spread. Keratinocytes that divide rapidly in this layer use melanin to protect themselves from radiation damage. Melanin is also present in hair, made up of dead keratinocytes (Negin et al., 2003). The thickness of the hair and the amount of melanin work together to produce most hair colors and provide additional protection against harmful UV radiation.

PHYSIOLOGICAL AND ANATOMICAL STAGES

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1 The primary melanoma is only on the skin and is relatively thin. Stage I is divided into subgroups, IA or IB, depending on the thickness of the melanoma (Rigel et al., 2010). This stage also depends on whether a pathologist sees ulceration under the microscope.

2 At this stage, the melanoma is thicker than stage I melanoma and extends through the epidermis and then further into the dermis, making it have a greater chance of spreading (Zhang et al., 2006). Stage II is divided into three subgroups: A, B, or C, depending on the thickness of the melanoma and whether there are ulcerations.

3 This stage describes a melanoma that has spread locally or through the lymphatic system to a regional lymph node near the start of cancer or to an area of the skin on the way to a lymph node known as in-transit metastasis, satellite metastasis, or Microsatellite disease (Zhang et al., 2006). Stage III is divided into four subgroups: A, B, C, or D, based on the size and number of lymph nodes associated with melanoma, whether the primary tumor has satellite or intransitive lesions, and whether it appears ulcerated under the microscope.

4 This stage describes a melanoma spread to other body parts through the bloodstream, such as distant areas of the skin or soft tissues, lymph nodes, or other organs such as the lungs, liver, brain, bones, or gastrointestinal tract (Zhang et al., 2006). Stage IV is further assessed based on the location of the distant metastasis:

M1a: Cancer has only spread to outlying areas of skin and soft tissue.
M1b: Cancer has spread to the lungs.
M1c: Cancer has spread to all other places that do not affect the central nervous system.
M1d: Cancer has spread to the central nervous system, including the brain, spinal cord, cerebrospinal fluid, or on the brain or spinal cord lining (Zhang et al., 2006).

Signs and symptoms

Signs and symptoms may include a new, unusual growth or a change in an existing mole. Additionally, other signs to look out for include a spot that looks different from all of the other spots on your skin.·Also, the ABCDE rule is another method that can tell the usual signs of melanoma.

·A stand for Asymmetry: One half of a mole or birthmark does not match the other.
·B stands for Border: The edges are irregular, ragged, notched, or blurred.
·C stands for Color: The colour is not the same all over and may have varying shades of brown or black, or occasionally with patches of pink, red, white, or blue.
·D stands for Diameter: The spot is more significant than 6 millimeters across, measuring approximately ¼ inch the size of a pencil eraser even though melanomas can sometimes be smaller.
·E stands for Evolving:

The mole is changing in size, shape, or colour.
Other symptoms are;

·A sore that doesn't go away
·New swelling beyond the periphery of the mole.
·Change in sensation, for instance, tingling, tenderness, or discomfort.
·Change in the appearance of a mole – flaky, oozing, bleeding, or the formation of a lump or bump.

Diagnosis

To determine if a mole or spot is melanoma, removing a small part of the birthmark or spot and the surrounding tissue is usually necessary (Rigel et al., 2010). This is called a biopsy. The tissue is examined in a laboratory. The information from this test can determine if the tissue is cancerous and how deep it has grown below the skin's surface. Melanomas that are deeper than 1 millimeter are more likely to have spread to other parts of the body (Rigel et al., 2010). If this has happened, your doctor may suggest additional blood tests, CT scans, and chest x-ray.

If the melanoma is more than 1 millimeter deep, your doctor will want to know if it has spread to nearby lymph nodes (Rigel et al., 2010). To do this, youcan inject a radioactive liquid into the tumor. The fluid flows through the natural drainage path that connects cancer to nearby lymph nodes. You can follow the drainage route. The first lymph node beside the path is known as the sentinel node.

References

https://www.researchgate.net/publication/335191357_A_review_of_microsampling_techniques_and_their_social_impact

Jaworek-Korjakowska, J., & Kleczek, P. (2018). Eskin: a study on the smartphone application for early detection of malignant melanoma. Wireless Communications and Mobile Computing, 2018.https://www.researchgate.net/publication/323624522_eSkin_Study_on_the_Smartphone_Application_for_Early_Detection_of_Malignant_Melanoma

Lei, B. U., & Prow, T. W. (2019). A review of microsampling techniques and their social impact. Biomedical microdevices, 21(4), 1-30. https://www.researchgate.net/publication/335191357_A_review_of_microsampling_techniques_and_their_social_impact

Negin, B. P., Riedel, E., Oliveria, S. A., Berwick, M., Coit, D. G., & Brady, M. S. (2003). Symptoms and signs of primary melanoma: important indicators of Breslow depth. Cancer, 98(2), 344-348.

Quintana, E., Shackleton, M., Sabel, M. S., Fullen, D. R., Johnson, T. M., & Morrison, S. J. (2008). Efficient tumour formation by single human melanoma cells. Nature, 456(7222), 593-598.

QRigel, D. S., Russak, J., & Friedman, R. (2010). The evolution of melanoma diagnosis: 25 years beyond the ABCDs. CA: a cancer journal for clinicians, 60(5), 301-316.
Zhang, S., Guo, H., Zhang, D., Zhang, W., Zhao, X., Ren, Z., & Sun, B. (2006). Microcirculation patterns in different stages of melanoma growth. Oncology reports, 15(1), 15-20.