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Melanoma seen as the Curse of the Sun Exposed

The first accredited mention of melanoma was by Hippocrates in the fifth century, B.C. The oldest finding of melanoma is in Peruvian mummies radiocarbon dated to 2400 years ago. Examined in the 1960's, they were found to have melanoma of the skin with local tumors and bone metastasis. These mummies were found a high elevation and no doubt lived a life with significant sun exposure.

Melanocytes are the skin cells which provide the color to normal skin. The difference in skin color between fair people and dark people is due not to the number of melanocytes in their skin, but to the melanocytes' level of activity. Through a process called *melanogenesis*, these cells produce the pigment melanin. There are usually 1000 to 2000 melanocytes per square millimeter of skin.

Melanoma is a cancer of the skin arising from the melanocytes. It accounts for only about 5% of all skin cancer, but is responsible for the majority of skin cancer deaths. This year it is estimated there will be over 62,000 new cases of melanoma in the United States. The lifetime risk of developing melanoma is 1 in 57 for males and 1 in 81 for females.

It is thought that exposure to UV-B radiation increases the risk of melanoma. This is correlated with the finding that people living closer to the equator or higher elevation with more sun exposure have a higher risk of melanoma. This radiation causes mutations in DNA, in the genes important in controlling cell growth. The damage to these genes allows the melanocytes to grow out of control. This risk seems to be acquired early in

life, probably the first 20 years. Individuals from high sun exposure countries retain their risk of melanoma even when they move to lower sun countries. People with fair skin and those with red hair are at increased risk. There is also a definite increased lifelong risk associated with severe sunburn in one's youth. While sunscreen works to prevent sunburn, it doesn't reduce the risk of melanoma.

Most people are aware that a dark colored mole, particularly one that has changed in size or ulcerated is a matter of concern. Additional ways of identifying melanomas are the ABCDE's. These are *A*symmetric outline, changing irregular *B*orders, variation in *C*olor, *D*iameter greater than 6 mm, and *E*levation. Any combination of these findings raises concern, and should be further investigated. The first step is usually examination by a physician and a biopsy.

The prognosis (long term outcome) for melanoma can best be estimated by its thickness and whether or not it has spread to local lymph nodes. Most melanomas diagnosed today are fairly thin. Thicker melanomas have a much poorer outcome. This poor prognosis is also true of melanomas which have spread to the lymph nodes. Modern surgical treatment of a melanoma will involve surgical removal with a surrounding margin of normal skin, and then sentinel lymph node biopsy. The sentinel lymph node is that node or small group of nodes that are determined to be the first place a tumor would spread. Removal of these nodes is considered to give accurate information about all the regional lymph nodes.

Following surgery, high risk tumors may be treated with adjuvant therapy. This is normally a year of intravenous interferon, but not all researchers agree that it is helpful. An interesting new therapy announced from a group in Israel is a vaccine to prevent recurrence. The vaccine is made from the patients own tumor and seems to be most effective if the remaining tumor is microscopic in size. Because each vaccine is created

individually, it may be too expensive to be a commercially viable therapy. Various chemotherapy agents have been tried for metastatic melanoma with occasional remarkable results, but in most cases a limited response is all that is seen. For this reason early detection and early treatment provide the best outcome.

In summary, melanoma is a skin cancer more common in the highly sun exposed population. It is identified by the ABCDE's and when in doubt a biopsy is a good idea. Surgical treatment when it is small offers the best chance for a cure.

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