Diagnosis and Management of Common Skin Cancers

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More cancers occur on the skin than any other site. Yet, because the skin is directly visible and easily accessible, these tumors offer a unique opportunity for eradication and cure. Indeed, if all skin cancers were accurately diagnosed and adequately treated at an early stage of development, the current morbidity and mortality rates would be reduced.

The three most frequent types of cutaneous cancer, accounting for the great majority of all primary malignant tumors of the skin, are basal cell carcinoma, squamous cell carcinoma and malignant melanoma. According to New York State statistics for 1960, the skin cancer incidence rates per 100,000 population are as follows:

| Diagnosis               | Male  | Female |
|-------------------------|-------|--------|
| Basal Cell Carcinoma    | 26.7  | 20.5   |
| Squamous Cell Carcinoma | 6.6   | 3.0    |
| Malignant Melanoma      | 2.8   | 3.1    |
| Multiple                | 2.2   | 1.5    |
| Other and Unspecified   | 2.6   | 1.8    |
| All Skin Sites          | 40.9  | 29.9   |

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In examining these figures, however, one must remember that the stated incidence of basal cell carcinomas is a low estimate of the actual number. Because of their ubiquitous nature, these tumors are frequently treated simply as small, inconsequential problems, and many lesions are not reported. Some basal cell carcinomas can produce considerable morbidity and, rarely, even mortality, especially after multiple recurrences.

Other less frequent, but nonetheless important, cancers that may arise primarily on the skin include Bowen's disease (squamous cell carcinoma in situ), as well as tumors of the cutaneous adnexal structures (sweat gland adenocarcinomas); vascular system (Kaposi's sarcoma, lymphangiosarcomas); connective and muscular tissues (dermatofibrosarcoma protuberans, leiomyosarcoma); reticuloendothelial system (malignant lymphoma) and others. The skin may also be a site for cutaneous metastases particularly from melanoma and cancers of the lung, large intestine, breast and ovary.

Accurate histologic diagnosis of all skin cancers is essential. This, in turn, depends on an adequate biopsy specimen. With rare exceptions, an extensive therapeutic procedure should not be un-
detected until a confirmed tissue diagnosis has been established.

If subsequent definitive excisional surgery is contemplated, the biopsy incision should be placed so that the resulting scar can be readily excised. Of course, many small carcinomas can be eradicated at the time of biopsy. However, if a malignant melanoma is suspected, total excisional biopsy is preferred. But if it entails a large or disfiguring procedure, incisional biopsy is recommended.3,4

A great deal is known about the etiology of skin cancer. It may result from exposure to electromagnetic radiation (sunlight, X-ray) or chemical carcinogens (arsenic), genetic predisposition (nevus basal cell carcinoma syndrome, xeroderma pigmentosum), or thermal burns, etc. As a result, a large percentage of skin cancers can be prevented.

The early diagnosis of skin cancer depends largely on a high degree of suspicion, as well as clinical acumen. This means that the physician must carefully examine and biopsy any:

- Persistent ulcer not explained by another cause;
- Ulcer in an old thermal burn scar or X-ray treated site;
- Suspicious cutaneous lesion in a patient previously exposed to large amounts of ultraviolet irradiation, arsenicals or petroleum products;

| Skin Ca                  | Incidence                                                                 | Clinical Characteristics                                                                 | Common Sites                                                                 |
|-------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Basal Cell Carcinoma    | Most common form of skin cancer, it occurs primarily in patients exposed to intense sunlight, especially fair complected Caucasians with light eyes and hair. | Nodular basal cell ca: Elevated lesions with an umbilicated, ulcerated center, raised margin and waxy or "peary" border; moderately firm. Superficial basal cell ca: Plaque, usually with a crusted and erythematous center and a raised, pearly border; often multiple. | Commonly found on the nose, eyelids, cheeks and trunk. Uncommon on palms and soles. Metastases are extremely rare. |
| Squamous Cell Carcinoma | Less common than basal cell, it occurs primarily on areas exposed to actinic radiation. | Appearance varies from an elevated nodular mass to a punched-out ulcerated lesion or a large fungating mass. Unlike basal cell ca, squamous cell tumors are opaque. | 75% occur on head; 15% on hands and 10% elsewhere. Can metastasize to regional lymph nodes; in more advanced lesions, pulmonary metastasis can occur. |
| Malignant Melanoma      | Far less common than basal or squamous cell ca. Probably no more than one nevus in a million develops into malignant melanoma. | Usually pigmented (black, gray, blue, brown, red); often under 2.5 cm, in size. The lesion may be flat or elevated, eroded or ulcerated. | Relatively common on nailbeds, mucous membranes, anal canal. This lesion spreads by local extension, regional lymphatics and bloodstream. |
Fig. 1. Nodular basal cell carcinoma. The most common type of basal cell carcinoma. Characteristic features include a translucent "pearly" border with overlying fine telangiectasias and central crust obscuring the ulcer beneath.

Fig. 2. Nodular basal cell carcinoma. This early lesion well represents the elevated "pearly" border and the umbilicated center of this type of tumor.

- firm cutaneous or subcutaneous mass of unusual nature;
- pigmented or nonpigmented mole that is undergoing a growth pattern significantly different from its expected biologic behavior.

During the examination for possible cutaneous cancers, the patient should be completely undressed so that the entire integument can be inspected. Skin cancers are not infrequently multiple and the patient may be unaware of other lesions, especially in areas not readily visible to him. For a proper cutaneous examination two things are essential: a high index of suspicion and good lighting. A gooseneck light or comparable illumination throws oblique light across the skin surface, often pinpointing unobtrusive lesions. Following this topographical inspection, the regional lymph nodes should be carefully palpated.

Note the lesion’s size, elevation, consistency, color and the presence of ulceration. Also carefully determine its mobility in relation to underlying tissues, and its proximity to nearby important anatomical structures. These factors may have an important bearing on the choice of therapy. Color photographs of lesions are particularly helpful.

Once an accurate tissue diagnosis has been made of an incompletely removed lesion, the method of treatment depends on the location and size of the lesion, the patient’s age and general condition, and the histologic type of cancer involved.

**Basal Cell Carcinoma**

The incidence of basal cell carcinoma is highest in those regions of the world
where sunlight is most intense and on those areas of the body that receive the most sunlight. Caucasians are most susceptible, particularly those who have light eyes, light hair, fair complexions, sunburn easily and spend more hours per day outdoors than the general population. Some individuals have an inherited predisposition to this neoplasm. The incidence of basal cell carcinoma is lowest in deeply pigmented races.

The two major clinical types include: nodulo-ulcerative basal cell carcinoma and superficial basal cell carcinoma. (Table 1.)

The nodulo-ulcerative basal cell carcinoma is most common. This elevated lesion has an umbilicated, ulcerated center and raised margins with a waxy or "pearly" gleam. Occasionally, telangiectatic vessels may be seen threading across the border. The lesion is moderately firm to the touch. (Figs. 1, 2 and 3.)

The superficial basal cell carcinoma is often multiple and frequently appears on the trunk. It presents as a superficial, sharply marginated plaque with a raised, pearly, thread-like border. The center is usually crusted, scaly and erythematous. Deep ulceration is uncommon, but a deeply invasive nodular component within the plaque is occasionally present. (Fig. 4.)

Other less common types of basal cell carcinomas include the cystic (Fig. 5) and pigmented varieties. When, as sometimes occurs, a basal cell carcinoma is deeply pigmented, the differential diagnosis of malignant melanoma must be considered. (Fig. 6.) A very subtle basal cell carcinoma, the morphea type, may appear as a flat white spot.
which slowly enlarges to form a plaque. This lesion may be very difficult to diagnose clinically and only a biopsy will reveal its true nature.7 (Fig. 7.)

In general, basal cell carcinomas are most frequently found around the nose, eyelids and cheeks, but they can occur anywhere on the skin. However, the palms and soles are very rarely involved. At times, the lesion may be so extensively ulcerated that the typical pearly border with its occasional telangiectatic vessels may be difficult, if not impossible, to see. (Fig. 8.) In this case, knowledge of the lesion’s history, location and behavior will help suggest the diagnosis, even before a biopsy is performed.

Local extension and invasion by basal cell carcinoma is the principal problem of management. Metastasis is very rare; only a few cases have been reported.8

The treatment of basal cell carcinoma is usually surgical excision or radiation therapy. Dermatologists frequently treat these lesions with electrodesiccation and curettage. In recent years, Mohs chemosurgery has had a high degree of success in curing difficult recurrent lesions where the extent of the tumor margin is in doubt.9,10 This method uses a zinc chloride paste to fix the tissues in vivo, surgical removal of the cancer in multiple, progressive layers and painstaking microscopic examination of each excised specimen. Topical chemotherapy, cryotherapy and immunotherapy have also been used for the treatment of basal cell carcinoma, but still must be considered in the developmental phase until long-term follow-ups of a sufficient number of lesions are reported.11
Since recurrent basal cell carcinoma can produce considerable morbidity and occasionally mortality, it is incumbent on the physician who initially treats the patient to do his utmost to completely eradicate the tumor the first time.

When a basal cell carcinoma is treated by surgical excision and the biopsy indicates that the tumor reaches the surgical margins, the area should be re-excised. Several studies show a high incidence of reappearance when basal cell carcinomas are "incompletely excised."12,13 In addition, some investigators feel that it is preferable not to shift flaps of tissue to cover the defects of excision;14 one cannot be sure the lesion has been adequately excised until the specimen has been thoroughly examined and the surgical margins found wide of the tumor. In addition to this must be added the test of time. Placing a flap of skin and subcutaneous tissue over a surgical defect may shift tumor-containing tissue before the final pathology report has been rendered. Even more important, it may delay the detection of reappearance. While there are indeed times when an immediate flap is required (such as for a full-thickness defect of a cheek, lip or eyelid), in most instances a free full-thickness graft will give a very acceptable cosmetic result. The result is often so cosmetically good that patients rarely ask that the graft be removed and replaced with a flap.

In general, if a patient is carefully selected for a particular treatment modality, surgery, radiation therapy, electrodessication and curettage and Mohs chemosurgery may all, in the hands of skillful physicians, give good results.
Squamous Cell Carcinoma

Squamous cell carcinoma occurs less frequently than basal cell carcinoma and tends to develop primarily on areas exposed to actinic radiation. Approximately 75 percent are on the skin of the head (face, cheeks, ears, nose, lips), 15 percent on the hands and 10 percent elsewhere. This tumor can metastasize to the regional lymph nodes and, therefore, shows a higher mortality rate than basal cell carcinoma.

Numerous factors may lead to the development of squamous cell carcinoma on the exposed surfaces of the skin. For instance, the lesion may arise from pre-existing "actinic keratoses." These erythematous, scaly lesions are found on the face, shoulders and dorsa of the hands in patients markedly exposed to the elements. Squamous cell carcinoma may also occur in old, unstable thermal burn scars, many years after the original injury was incurred (Marjolin’s ulcer). It develops at sites of chronic sinus tracts, such as those from osteomyelitis or other long-standing chronic infections, where previous radiation therapy was administered many years earlier. (Figs. 9 and 10.) The latter is a compelling reason to avoid excessive radiation therapy to infants or children for benign lesions, unless no other method of treatment is available for very pressing problems. Squamous cell carcinoma is also known to occur after prolonged exposure to coal tar derivatives, hydrocarbons, arsenicals and other chemicals. Pott’s squamous cell carcinoma of the scrotum in chimney-sweeps, described in 1775, was the first identified etiological agent of cancer.
The clinical appearance of squamous cell carcinoma varies from a scaly and ulcerated lesion or an elevated nodular mass to a punched-out ulcerated lesion or a large fungating tumor. (Fig. 11.) (Table 1.) As previously mentioned, this tumor can spread to lymph nodes and the regional nodes must therefore be carefully evaluated at each examination. In addition, a chest X-ray is necessary to rule out pulmonary metastases in more advanced lesions.

Primary squamous cell carcinoma is treated in much the same way as basal cell carcinoma. Surgery, radiation therapy and chemosurgery (Mohs) are the usual treatments of choice. Adequate margins in width and depth must be provided in order to prevent reappearance. Electrodesiccation and curettage may also be successfully used. 23

Elective regional lymph node dissections are not recommended as routine treatment for most squamous cell carcinomas. Unlike malignant melanoma, once the regional lymph nodes are clinically involved with squamous cell carcinoma, a regional lymph node dissection may be performed without great risk that the tumor has spread beyond the nodes. Lymph node dissections for squamous cell carcinoma are usually performed only when the lymph nodes are thought to contain tumor.

Melanoma

The incidence of this tumor is, fortunately, lower than the previously mentioned two lesions since it is a much more lethal cancer. Etiologically, melanomas often appear to be related to previous pigmented nevi or birthmarks. Al-
This is the onset of the "vertical growth phase." Note areas of presumed spontaneous involution near the center of the plaque indicated by the relatively nonpigmented flat areas.

Fig. 13. Superficial spreading melanoma. Superficial spreading melanoma begins as an elevated plaque often with red, white and blue superimposed on tan, brown and black. The border of a superficial spreading melanoma is palpable whereas that of a lentigo maligna is not. After some months or a few years, one or more papules and nodules develop on the surface of the plaque.

Fig. 14. Nodular melanoma. Unlike lentigo maligna melanoma and superficial spreading melanoma, nodular melanoma does not have a surrounding hyperpigmented macular area.

Melanoma tends to spread not only through local extension and regional lymphatics but also through the bloodstream. This accounts for its high mortality rate. The incidence of local reappearance is also high if the primary site is not adequately excised.

In appearance, a melanoma is usually pigmented (black, gray, blue, brown, red). It may not be particularly large and often is under 2.5 cm. in size. The lesion may be flat or elevated, eroded, or ulcerated. Not infrequently "leaking" pigment or "satellite" lesions are present around the periphery. These represent early spread of the tumor from the primary site. The regional lymph nodes must be carefully examined but even when they feel negative on palpation, at least 18 percent already contain microscopic deposits of melanoma. A chest X-ray and liver chemistries should be done prior to definitive therapy in order to determine if distant metastases have already occurred. A liver scan may also be helpful. In addition the patient should be carefully examined for any signs of distant subcutaneous nodules.

The definitive diagnosis of this lesion is best confirmed by means of a total excisional biopsy. If the lesion is exceptionally large, an adequate and repre-
sentative incisional biopsy must be performed. The direction of the biopsy incision scar should be placed so that it can be readily and widely removed at the time of definitive surgery. In recent years the histologic classification of melanoma described by Mihm and Clark and others has been used to determine the type of melanoma being treated, as well as its depth of invasion. These authors have suggested that most melanomas can be divided into three clinicopathologic types: lentigo maligna melanoma (Fig. 12); superficial spreading melanoma (Fig. 13); and nodular melanoma (Fig. 14). Furthermore, each lesion can be classified by its depth of invasion in the skin:

Level I = intraepidermal;  
Level II = invasion of the papillary (superficial) dermis;  
Level III = tumor filling the papillary dermis and invading to the junction of the papillary and reticular (deeper) dermis;  
Level IV = invasion into the reticular dermis;  
Level V = invasion into the subcutis.

Knowledge of the type of melanoma and its depth of invasion is important in planning management and making a prognosis.

Surgery is the preferred method of treatment since melanomas are not ordinarily radiosensitive. Chemotherapy and immunotherapy have also been used in the treatment of advanced melanomas. The recommended treatment for the melanotic freckle of Hutchinson and superficial spreading melanomas (Levels I and II), in the absence of distant metastases, is wide and deep excision of the primary site, following the original biopsy. Ordinarily, the underlying muscle fascia is simultaneously removed and a skin graft is often required to cover the defect. For more deeply invasive malignant melanomas (Levels III, IV and V), the primary site is treated in the same manner but elective removal of the regional lymph nodes is advocated by many cancer surgeons. However, elective removal of the regional lymph nodes is contraindicated in:

- melanomas arising in the melanotic freckle of Hutchinson;
- superficial melanomas (Levels I and II);
- a primary melanoma situated so that lymphatics drain to several different groups of regional lymph nodes;
- patients very ill with intercurrent disease;
- very elderly patients;
- presence of distant metastases.

| Table 2. Danger Signals Suggestive of Malignant Transformation in Pigmented Nevi |
| Change in Color: Especially red, white and blue; sudden darkening, especially shades of dark brown or black; spread of pigmentation from the periphery into previously apparently normal skin. |
| Change in Size: Especially sudden enlargement. |
| Change in Surface Characteristics: Especially scaling, erosion, oozing, crusting, bleeding, ulceration or development of a mushrooming mass on the surface of the lesion. |
| Change in Consistency: Especially softening or friability. |
| Change in Symptomatology: Especially a sense of pruritus, tenderness or pain. |
| Change in Shape: Especially rapid elevation from a previously flat condition. |
| Change in the Surrounding Skin: Especially signs of inflammation with redness or swelling or appearance of satellite pigmentation. |
Fortunately, effective methods for treating primary melanomas and the regional lymph nodes to which they frequently spread are available. The difficult problem of hematogenous spread has still not been solved, however.

Chemotherapeutic and immunotherapeutic approaches are currently being used for advanced melanomas. Unfortunately cure rates are very low, but significant palliation can often be achieved.

The prevention of malignant melanomas by removing all pigmented nevi is obviously not practical since their number is far too great. However, nevi situated in sites where melanomas are relatively common, but moles are uncommon (e.g., nailbeds, mucous membranes, anal canal) or those nevi which do not conform to expected biologic behavior should be removed.

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