Each year in the US, clinicians treat more than 5.4 million cases of non-melanoma skin cancer (NMSC) in more than 3.3 million people.1 While many people know how to identify the suspicious irregular-shaped moles that could be melanoma, fewer are familiar with the warning signs of NMSC. Recently, the Mayo Clinic published a study that shows that the incidence of the two most common types of NMSC have increased significantly in recent years. The report showed an increase of 263 percent in cases of squamous cell carcinoma (SCC) and 145 percent in cases of basal cell carcinoma (BCC) between 2000 and 2010.2

The study results also show that there is a disproportionate increase in the incidence of NMSC in women, as well as a shift in anatomical distributions. Women overall had the greatest increase in incidence rates for both BCC and SCC, and younger women (under 40 years old) experienced more cases of NMSC compared to younger men. Over the study period, the anatomical distribution of BCC shifted from the head and neck to the torso while SCC shifted from the head and neck to the extremities.

**NMSC: CAUSES AND HOW TO IDENTIFY IT**

As NMSC incidence rates increase, it is more important than ever to understand both prevention and surveillance strategies. This includes following proper guidelines when performing skin self-exams, which the Skin Cancer Foundation recommends doing every month.3 For identification of melanoma, the ABCDE rule (A for asymmetry, B for border irregularity, C for color, D for diameter greater than 6mm, and E for evolving)4 can be an effective guideline to follow. If a mole exhibits one or more of these characteristics or changes in size, shape, color or elevation, or if you experience new symptoms, such as bleeding or itching, you should contact your doctor immediately. However, the ABCDE rule is not as effective in monitoring for NMSC; these lesions do not appear as irregularly shaped and dark pigmented moles. BCC often appears as a small bump or itchy red or pinkish spot that can bleed easily from slight friction. BCC also often develops on the face, where it might be confused with a pimple. Meanwhile, SCC typically appears as a rough or warty growth that is thicker and more irregular compared to BCC and can be extremely painful. BCC is the most commonly occurring cancer in the world; an estimated 20 to 30 percent of people will experience BCC during their lifetime.5

---

“In this targeted approach reduces the risk of radiation exposure to nearby healthy tissue and results in virtually no scarring and a reduced risk of complications compared to traditional surgical options.”

---

**Painless, Non-Invasive Treatment for Non-melanoma Skin Cancer Offers Patients a Convenient Alternative**

In recent years, an increasing number of clinicians and patients have opted for treatment with an advanced form of radiation called electronic brachytherapy (eBx).

**BY DAVID BERMAN, MD**
Recent research suggests that climate change and ozone depletion, which can increase exposure to ultraviolet (UV) radiation, may be playing a role in the increased incidence of skin cancer. Unlike melanoma, where the relationship between UV exposure and tumor development is still ambiguous, the incidence of NMSC (especially BCC) directly correlates with prolonged sun exposure. With warmer, drier summers, people are more likely to spend more time outdoors, increasing their exposure to sunlight and UV radiation. This is especially true for people who live in four-season climates who may be more inclined to soak up as much sun as possible in the summer months. During the summer people also tend to wear clothing that leaves skin open to increased sun exposure.

Most NMSC occurs in people over the age of 50, but cases in people in their 30s and 40s are not uncommon, especially if they are very fair skinned, burn easily, and have excessive sun exposure. Research suggests that patients who have had NMSC once are at higher risk for not only future cases of NMSC, but also for developing other malignancies, such as cancers of the buccal cavity, salivary glands and lungs, as well as lymphoma, leukemia, and melanoma.

**CURRENT STANDARD OF CARE**

There are three options for treating most cases of NMSC: surgery, chemotherapy, or radiation. Typically, the standard of care treatment for NMSC is Mohs micrographic surgery. This treatment involves surgical removal of the lesion, which can result in disfigurement, depending on the size and anatomical location of the lesion. In some cases, disfigurement associated with Mohs surgery can be so severe that patients require corrective plastic surgery, resulting in additional procedures, costs, and an increased risk of complications.

Radiation therapy is another treatment option for NMSC that has been used for decades. The traditional methods of administering radiation therapy for NMSC can be cumbersome for both providers and patients. The options for radiation, including traditional brachytherapy, orthovoltage, and electron beam treatment, can require a significant capital investment in equipment and shielded treatment vaults. During the procedure, patients must typically remain alone in the treatment room while healthcare professionals remain outside the room to reduce their risk of exposure. In addition, traditional radiation regimens usually consist of daily treatment sessions for up to six weeks, which can present logistical challenges and significant inconvenience to patients.

**A PAINLESS, NON-INVASIVE ALTERNATIVE RADIATION TREATMENT**

In recent years, an increasing number of clinicians and patients have opted for treatment with an advanced form of radiation called electronic brachytherapy (eBx). This option has been clinically proven to be safe and effective for appropriate patients. The procedure is painless and non-invasive, and involves a shorter course of treatment compared to other forms of radiation therapy. eBx uses a miniaturized, high-dose rate X-ray source to deliver targeted radiation directly to cancer cells. This targeted approach reduces the risk of radiation exposure to nearby healthy tissue and results in virtually no scarring and a reduced risk of complications compared to traditional surgical options. For both patients and healthcare teams, eBx requires minimal shielding, allowing medical personnel to remain in the room during treatment, which can improve patient comfort. eBx typically requires a total of eight treatment sessions in an outpatient setting, which improves convenience and compliance and can allow patients to resume their normal activities quickly.

Recent clinical data has shown local control rates above 90 percent for both BCC and SCC following treatment with eBx, meaning that eBx can prevent NMSC from growing beyond the site of origin.

At the Berman Skin Institute, we adopted eBx using the Xoft Axxent Electronic Brachytherapy System. With the Xoft System, eBx is typically delivered two times a week for four weeks, compared to traditional radiotherapy that can require 20-40 treatments. Each eBx treatment takes less than three minutes. A growing body of evidence supports the use of eBx for NMSC patients who meet specific selection criteria. Ideal candidates for eBx include patients with lesions in anatomically challenging locations such as the ear, nose, scalp, neck, and shin, patients who may have trouble with wound healing, are on anticoagulants, or have pacemakers, patients with medical comorbidities (such as dementia or Parkinson’s disease) that may preclude them from surgery, and patients not interested in pursuing surgery for personal reasons. Patients seem to appreciate the advantages of eBx, including added convenience, fewer treatments, and excellent clinical results. In a recent study, patients unanimously agreed that treatment with eBx was convenient, and most patients said they would recommend the treatment to a friend with NMSC.

A recent study published in the Journal of Contemporary Brachytherapy also found that rates of recurrence of cancer were virtually identical in patients treated with eBx using the Xoft System or Mohs surgery. At about three years post-treatment, 99.5 percent of NMSC lesions treated with eBx and 100 percent of NMSC lesions treated with Mohs surgery were free of recurrence. Statistics provided by the American College of Mohs Surgery state that Mohs surgery has a success rate “up to 99 percent.” In addition, physician-rated cosmetic outcomes were either “excellent” or “good” in 97.6 percent of eBx-treated lesions and 95.7 percent of Mohs surgery.

(Continued on page 88)
cent of Mohs-treated lesions. These results reflect findings from previous studies that assessed outcomes with eBx in the treatment of early-stage NMSC. During one study, a review of outcomes of treatment for 297 lesions at up to 63 months of follow-up showed only one case of recurrence and excellent cosmesis in 100 percent of patients at years four to five. A second study of 524 lesions treated with eBx with mean follow-up at 12.5 months showed a 0.7 percent recurrence rate.

With the incidence of NMSC on the rise, efforts to help patients reduce their risk are more important than ever. For patients who do develop NMSC, the availability of advanced technologies to treat NMSC reinforces the essential need for patients to discuss the risks and advantages of different treatment options with their physicians.

David Berman, MD is Medical Director, Berman Skin Institute in Palo Alto, CA and surrounding areas.

(Continued from page 68)

Last month’s edition featured coverage of another non-surgical treatment option for NMSC: superficial radiation therapy. Read the article at PracticalDermatology.com/2017/08

15. A. Bhutnagar. Electronic Brachytherapy for the Treatment of Non-Melanoma Skin Cancer: Results up to 5 Years. Presented at ASTRO 2015.