Margin Analysis
Cutaneous Malignancy of the Head and Neck

Donita Dyalram, DDS, MD[a,*], Steve Caldroney, DDS, MD[a], Jonathon Heath, MD[b]

KEYWORDS

• Margin analysis • Cutaneous malignancy • Margins of skin cancers • Basal cell carcinoma • Squamous cell carcinoma • Cutaneous melanoma

KEY POINTS

- Frozen section analysis of basal cell carcinoma and squamous cell carcinoma is best accessed by complete circumferential and peripheral and deep margin assessment (CCPDMA) or Mohs micrographic surgery. Pan cytokeratin stains can be used in challenging cases.
- Immunostaining with MART-1 has improved frozen section analysis of cutaneous melanoma.
- The use of immunostains has made significant strides in frozen section analysis of cutaneous malignant melanoma.

INTRODUCTION

This article focuses only on margin analysis of the cutaneous malignancy of the skin and discusses basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and cutaneous malignant melanoma (CMM). The management of the neck and distant disease are beyond the scope of this article. It answers what is the appropriate surgical margin when excising these skin tumors, validity of frozen section analysis, and what to do if a positive resection margin is identified both intraoperatively and in the postoperative setting.

Skin cancer is a growing concern worldwide and has increased at epidemic rates as the baby boomer population ages. In the United States, it is the most common form of cancer, with 1 in 5 Americans developing skin cancer in their lifetime. Eighty percent of sun damage that will lead to skin cancer will have occurred before the age of 18 years.[1]

The 3 most common types of skin cancer are SCC, BCC, and CMM. Together, SCC and BCC are referred to as nonmelanoma skin cancer. It is difficult to accurately assess the number of new cases of skin cancer each year because they are inconsistently accounted for in tumor registries due to their high incidence and management in outpatient settings. The current estimate is that there are approximately 3.5 million cases diagnosed in the United States each year. More than $400 million dollars are spent in the United States annually to treat this disease.[1]

BASAL CELL CARCINOMA
Epidemiology

BCC is the most common skin malignancy and accounts for 75% of all skin cancers. This is a cancer

Disclosure Statement: The authors have nothing to disclose.
[a] Department of Oral Maxillofacial Surgery, University of Maryland, 650 West Baltimore Street, Suite 1218, Baltimore, MD 21201, USA; [b] Department of Pathology, University of Maryland School of Medicine, 22 South Greene Street, Baltimore, MD 21201, USA
* Corresponding author.
E-mail address: ddyalram@umaryland.edu

Oral Maxillofacial Surg Clin N Am 29 (2017) 341–353
http://dx.doi.org/10.1016/j.coms.2017.04.001

that develops in the epithelial keratinocytes of the basal layer of the skin. Despite being the most common, it has a low metastatic rate and accounts for less than 1% of deaths caused by cancer.

Areas closer to the equator have a high incidence of nonmelanoma cutaneous malignancy. The state of Hawaii has 4 times the annual incidence of BCC compared with mainland United States.[2] The eyelids, nose, ears, lips, and scalp are most susceptible to sun damage. It is clear that sun exposure plays a critical role in the pathogenesis of BCC. Race and ethnicity are also important risk factors. Light hair, blue eyes, freckles, fair complexion, Celtic ancestry (Scottish, Irish, Welsh), and Fitzpatrick skin types I and II patients have increased incidence of BCC.[3]

Pathogenesis

BCC is a neoplasm of hair follicles arising from keratinocyte stem cells, sebaceous glands, and interfollicular basal cells. Ultraviolet (UV) damage to the DNA creates mutation to genes, such as p53 for BCC and SCC, and the Patched (PTCH1) gene in BCC. Mutation to the p53 suppressor gene in these cells leads to inhibition of apoptosis and the development of skin cancer. This is seen is about 56% of BCC and alteration to the PTCH1 gene is seen in 30% to 40% of sporadic BCC. This gene has been involved in 2 inherited disorders: Gorlin syndrome and xeroderma pigmentosum.[4]

Preoperative and Risk Assessment

A patient with a suspicious BCC needs a diagnostic workup, which will include a history and physical, a complete skin examination, and a biopsy. The biopsy should include the deep reticular dermis. If the tumor is suspected to have extensive disease, then imaging studies are needed. Extensive disease is defined as tumor that involves bone, has perineural invasion (PNI), and has spread into the deep soft tissue. An MRI with contrast is indicated if there is PNI. A computed tomography (CT) scan with contrast is indicated if there is bone involvement. The patient then undergoes a risk assessment to determine the preferred method of treatment.

A BCC is stratified as low risk if it is on the trunk or extremities. On the head and neck region, tumors on the forehead, cheeks, scalp, and neck are considered low risk. Primary tumors are those that are well-defined and have not been treated by other modalities. Additionally, there should be no evidence of PNI and histologic subtype should be nodular or superficial type.

The high-risk BCCs are those that are greater than 2 cm in the trunk and extremities, in the mask area of the face (around the eyes, nose, and lips), poorly defined, recurrent, has PNI, and shows an aggressive growth pattern (Fig. 1).

Management

Once a diagnosis of BCC is established, there are various therapeutic options available. In choosing the appropriate treatment option, size, location, histologic subtype, whether it has invaded local structures, and the presence of distant disease, will help to determine which modality is best. Curettage and electrodessication, cryosurgery, radiation therapy, Mohs surgery, laser surgery, surgical excision, photodynamic therapy, and medical treatment with interferon, imiquimod, 5-fluorouracil, and retinoids may play a role. However, to answer the question posed by this article, the focus is on surgical excision.

Surgical excision is the primary treatment modality. This is particularly true in locations where cosmesis is less an issue and where the tumor is well-demarcated.

The National Comprehensive Cancer Network (NCCN) recommends a 4 mm clinical margin for low-risk lesions.[5] For high-risk lesions, Mohs micrographic surgery or resections with complete margin assessment versus standard excision with wider

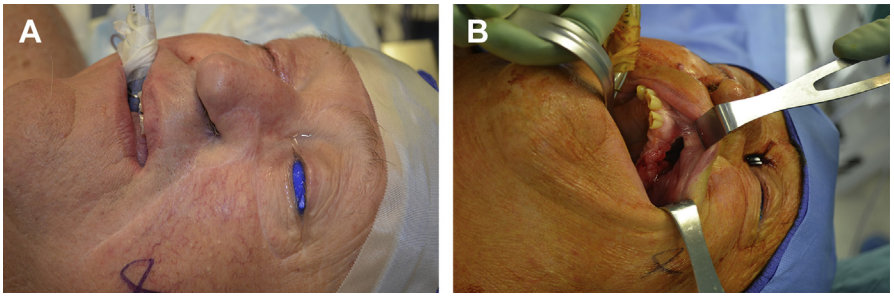

Fig. 1. (*A*) A recurrent BCC of the nose, which is considered high-risk because of its location in the mask area of the face. (*B*) The tumor has invaded into the maxilla. (*Courtesy of* Joshua E. Lubek, MD, DDS, Department of Oral and Maxillofacial Surgery, University of Maryland Medical Center.)