Practical Radiation Oncology (2015) 5, e543-e547

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Teaching Case

Radiation therapy for synchronous basal cell carcinoma and lentigo maligna of the nose: Response assessment by clinical examination and reflectance confocal microscopy

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Received 10 December 2014; revised 19 January 2015; accepted 2 March 2015

Introduction

Radiation therapy (RT) is a noninvasive treatment for a variety of skin cancers. Although surgery is often preferred for basal cell carcinoma (BCC) and lentigo maligna (LM), these conditions often affect patients that are medically inoperable, who decline surgery, or have lesions in challenging anatomic locations. Although nonsurgical treatments can be employed, close monitoring for disease recurrence and progression is of utmost importance. Typically, this is carried out by clinical examination, without adjunctive imaging. Reflectance confocal microscopy (RCM) is an emerging imaging technology that is proving useful to aid in the assessment of treatment response and disease recurrence (Fig 1). RCM has a high sensitivity (93%) and specificity (82%) for diagnosing LM (odds ratio = 60.8), and is Food and Drug Administration–approved for "review by physicians to assist in forming a clinical judgment."[1] Herein, we describe the case of a patient with a synchronously occurring BCC and LM of the nose, treated with definitive RT, and evaluated pre- and post-RT with RCM, which demonstrated complete response of the BCC and eventual recurrence of the LM.

Case report

An 83-year-old woman with a history significant for several nonmelanoma skin cancers and stage IV mantle cell lymphoma presented for management of a microinvasive LM of the nasal tip (Fig 2A). At initial consultation, mapping RCM using the handheld VivaScope 3000 (Caliber I.D. [formerly Lucid Inc], Rochester, NY) was performed and revealed areas of dendritic melanocytes and pagetoid cells diagnostic of melanoma as well as areas of polarized nuclei, tumor nests, and elongated blood vessels diagnostic of BCC (Fig 2B-C). Biopsies of these confocally suspicious areas to define the extent of the lesion revealed a multifocal BCC superior and lateral to the LM (Fig 2D-E). In light of the multifocal nature of the BCC and melanoma on the nasal

Conflicts of interest: Dr Barker reports personal fees from RP Pharmaceuticals, grants and personal fees from Elekta, grants and nonfinancial support from American Society for Radiation Oncology, nonfinancial support from MASCC, and nonfinancial support from MesoScale Diagnostics outside the submitted work. The other authors declare that they have no relevant or material financial interests that relate to the case described in this article.

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http://dx.doi.org/10.1016/j.prro.2015.03.006

Figure 1 VivaScope reflectance confocal microscope system.

bridge, the patient declined surgery because of the risk of significant disfigurement.

To treat both skin cancers, the patient elected to undergo definitive, curative-intent RT directed at the entire nose. She was treated with a prescription dose of 57.5 Gy in 23 fractions at the 96% isodose line (Fig 3C) using parallel, opposed, lateral 6-MV photon fields (Fig 3B) produced by a linear accelerator. A custom wax block bolus was created to allow for adequate dose buildup. Skin surface dose was measured in triplicate by optically stimulated luminescent diodes that confirmed the skin surface received 101.4% of the prescription dose. Treatment was carried out as planned with no interruptions or delays. The patient experienced the expected acute effects of RT, including grade 2 dermatitis (Fig 3A), mucositis, and grade 1 pruritus and fatigue. At 4 months post-RT, there was a complete clinical response with resolution of all apparent hyperpigmentation (Fig 4A); however, there were persistent features of LM by RCM, including atypical cells and architectural pleomorphism, and subtle signs of BCC on RCM, including tumor nests and clefting (Fig 4B-C). One year following treatment, a pigmented macule appeared on the patient's nasal tip, which enhanced on Wood's lamp examination (Fig 5A). RCM at that time revealed multiple large pagetoid dendritic cells in the epidermis, suggesting recurrence of the LM. No signs of BCC were noted by RCM (Fig 5B-C). The patient declined biopsy or topical treatments at that time and she elected to observe the lesion clinically, given concerns over side effects from treatment. The patient has remained asymptomatic with stable hyperpigmentation on examination, and RCM has been performed every 3 months (latest visit 21 months post-RT) with no evidence of dermal invasion detected.

Discussion

RT serves as a viable alternative for treatment of BCC and LM when the patient has comorbidities that limit surgery or when these lesions occur in areas where excision may result in significant cosmetic and/or functional deficit. One advantage of RT over surgery is the preservation of normal tissue within the radiation field. Treating the patient with a highly fractionated course allows for selective killing of tumor cells and sparing of

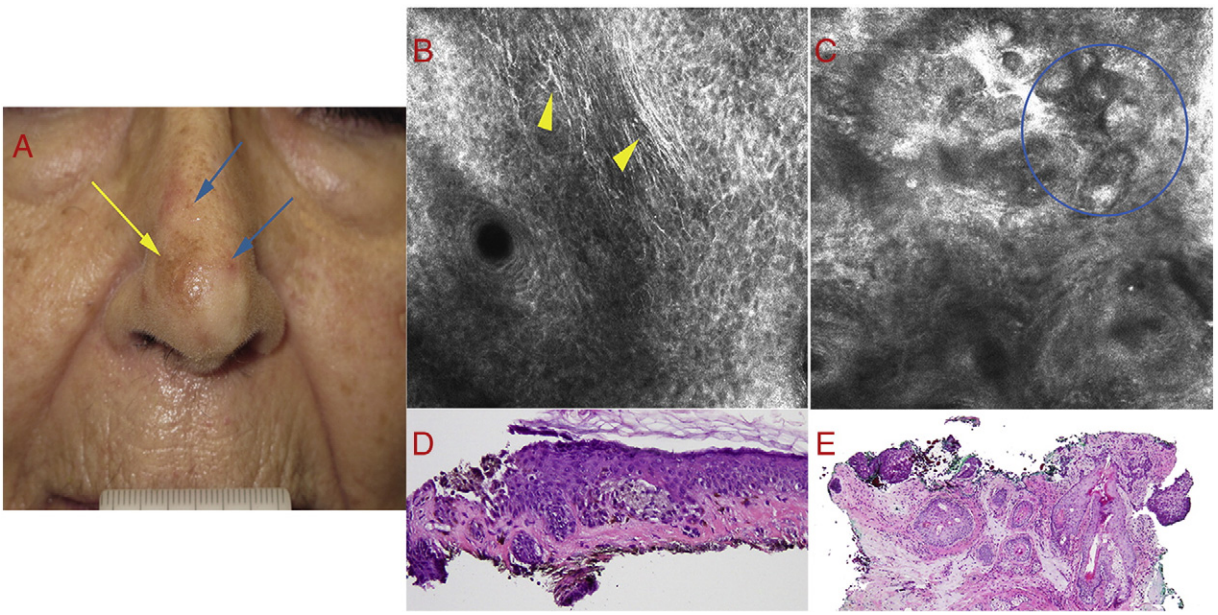

Figure 2 (A) Lentigo maligna of the right nasal tip presenting as a hyperpigmented patch with poorly defined borders (yellow arrow). Mapping biopsies guided by reflectance confocal microscopy showed clinically occult basal cell carcinoma at the sites indicated by the blue arrows. (B) Reflective confocal microscopy evaluation of the hyperpigmented patch identified sheets of atypical dendritic cells (yellow arrowheads) and epidermal disarray around adnexal structures. (C) Reflective confocal microscopy identified areas of tumor nests (blue circle) and dilated blood vessels suspicious for basal cell carcinoma. (D) Shave biopsy of the right nasal tip showing melanoma in situ extending to the margins (hematoxylin and eosin, 200×). (E) Mapping biopsies surrounding the hyperpigmented patch identified basal cell carcinoma encroaching on the melanoma (hematoxylin and eosin, 40×).