Reflectance confocal microscopy as a novel tool for presurgical identification of basal cell carcinoma biopsy site

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Key words: basal cell carcinoma; biopsy site identification; confocal; Mohs micrographic surgery; reflectance confocal microscopy; wrong site surgery.

TECHNICAL CHALLENGE

Wrong-site surgery is a potential complication and the most common reason for malpractice claims for dermatologic surgeons.[1,2] After biopsy, a skin cancer site might be difficult to identify by both the patient and the physician due to wound healing or background sun-damaged skin, especially on the head and neck.[2] The presence of multiple lesions that have been biopsied in close proximity further compounds this dilemma (Fig 1, *A*). Techniques that aid identification of the skin cancer site include triangulation, photos taken by the patient or physician, Wood's light, and dermoscopy. In some scenarios, none of these techniques help in the correct identification of the surgical site.

SOLUTION

When the biopsy site cannot be conclusively identified before surgery with the standard techniques described, noninvasive imaging technology can provide the solution. Reflectance confocal microscopy can be used to locate the residual basal cell carcinoma and correctly identify the surgical site (Fig 1, *B-E*). We use a handheld device (VivaScope 3000; Caliber Imaging and Diagnostics, Rochester, NY) to scout the theoretical 100% of the biopsied area. Reflectance confocal microscopy is advantageous in providing real-time noninvasive quasi-histologic images that both confirms diagnosis and identifies the surgical site.

REFERENCES

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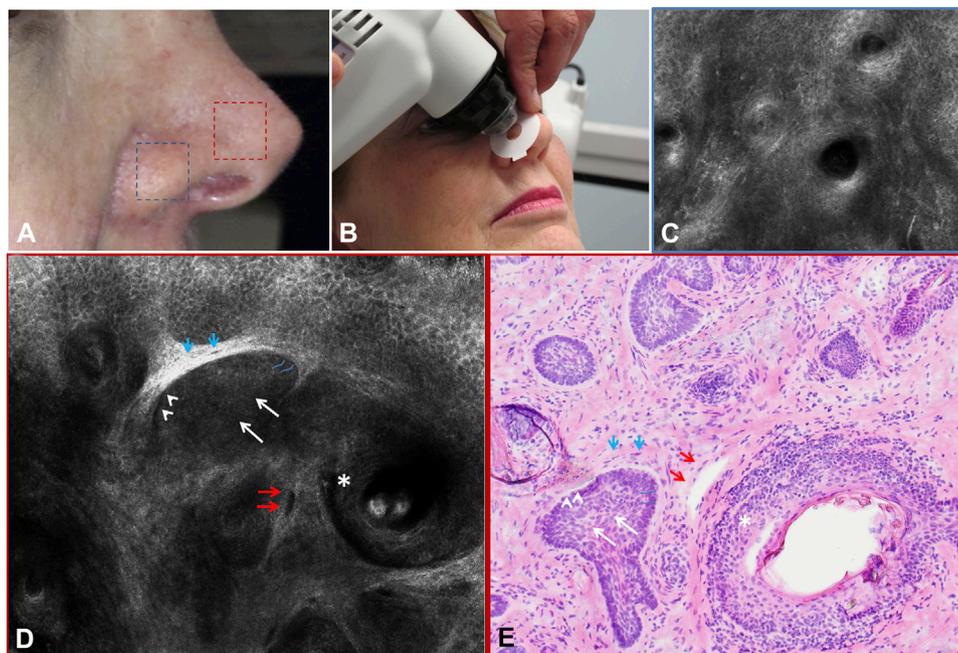
Fig 1. A, Patient presenting with 2 identical well healed biopsy sites on right nasal ala with no residual clinical lesions evident; the biopsy sites were labeled as (1) angiofibroma (*dashed blue square*) and (2) nodular basal cell carcinoma (BCC, *dashed red square*). **B**, To identify the correct surgical site of the BCC, we delineated the biopsy areas with paper rings and imaged with a handheld reflectance confocal microscope (RCM) using circumferential motions that explore the entire area at different levels of the skin. **C**, RCM findings of the angiofibroma biopsy site (*dashed blue square* on panel **A**) showing a regular honeycomb pattern and inflammatory cells; no tumor cells are seen (image size 750 × 750 μm). **D**, RCM findings of the BCC biopsy site (*dashed red square* on panel **A**) showed tumor islands (*white arrows*) with clefting (*white arrowheads*) and palisading (*blue lines*), dilated vessels (*red arrows*), and hyperreflective bundled collagen (*blue arrows*) surrounding a hair follicle (*white asterisk*) consistent with BCC (image size 750 × 750 μm). **E**, Photomicrograph of a Mohs frozen section showing residual BCC, nodular type (*white arrows*) with palisading (*blue lines*) and clefting (*white arrowheads*), a dilated vessel (*red arrow*), and surrounding fibrosis (*blue arrows*) adjacent to a hair follicle (*white asterisk*) (**C** and **D**, RCM image; original magnification: ×30; **E**, Hematoxylin-eosin stain; original magnification: ×20.)