

Photographic Confirmation of Biopsy Sites Saves Lives

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Quality photographic documentation of lesions prior to biopsy can decrease the risk of wrong site surgery, improve patient care, and save lives.

Preventable errors by health care workers are widespread and cause significant morbidity and mortality. Wrong site surgery (WSS) is a preventable error that causes harm through both the direct insult of surgery and propagation of the untreated initial problem. WSS also can cause poor patient outcomes, low morale, malpractice claims, and increased costs to the health care system. The estimated median prevalence of WSS across all specialties is 9 events per 1,000,000 surgical procedures, and an institutional study of 112,500 surgical procedures reported 1 wrong-site event, which involved removing the incorrect skin lesion and not removing the intended lesion.^{1,2}

Though the prevalence is low when examining all specialties together, dermatology is also susceptible to WSS.³ Watson and colleagues demonstrated that 31% of intervention errors were due to WSS and suggested that prebiopsy photography helps decrease errors.⁴ Thus, the American Academy of Dermatology has emphasized the importance of reducing WSS.⁵ A study by Nijhawan and colleagues found that 25% of patients receiving Mohs surgery at a private single cancer center could not identify their biopsy location because the duration between biopsy and surgery allowed biopsy sites to heal well, which made finding the lesion difficult.⁶

Risk factors for WSS include having multiple health care providers (HCPs) living remote from the surgery location involved in the case, being a traveling veteran, receiving care at multiple facilities inside and outside the US Department of Veterans Affairs (VA) system, mislabeling photographs or specimens, and pho-

tographs not taken at time of biopsy and too close with no frame of reference to assist in finding the correct site. The VA electronic health record (EHR) is not integrated with outside facility EHRs, and the Office of Community Care (OCC) at the VA is responsible for obtaining copies of outside records. If unsuccessful, the HCP and/or patient must provide the records. Frequently, records are not received or require multiple attempts to be obtained. This mostly affects veterans receiving care at multiple facilities inside and outside the VA system as the lack of or timely receipt of past health records could increase the risk for WSS.

To combat WSS, some institutions have implemented standardized protocols requiring photographic documentation of lesions before biopsy so that the surgeon can properly identify the correct site prior to operating.⁷ Fortunately, recent advances in technology have made it easier to provide photographic documentation of skin lesions. Highsmith and colleagues highlighted use of smartphones to avoid WSS in dermatology.⁷ Despite these advances, photographic documentation of lesions is not universal. A study by Rossy and colleagues found that less than half of patients referred for Mohs surgery had clear documentation of the biopsy site with photography, diagram, or measurements, and of those documented, only a small fraction used photographs.⁸

Photographic documentation is not currently required by the VA, increasing the risk of WSS. About 20% of the ~150 VA dermatology departments nationwide are associated with a dermatology residency program and have implemented photographic

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FIGURE 1 Case 1 Referring Facility Original Right Mid Back Biopsy Sites and Labels Identifying Lesion A Melanoma, September 2016



FIGURE 3 Case 1 Initial Dermatology Consult Mid Lower Back Biopsy Site Circled as Presumed Melanoma, February 2017

FIGURE 2 Case 1 Referring Facility Original Mid Lower Back Biopsy Site of Lesion C Noncancerous, September 2016



FIGURE 4 Case 2 Day of Surgery, No Clearly Identifiable Biopsy Site on Left Upper Back due to Many Scars

documentation of lesions before biopsy. The other 80% of departments may not be using photographic documentation. The following 3 cases experienced by the authors highlight instances of how quality photographic documentation of lesions prior to biopsy can improve patient care and save lives. Then, we propose a photographic documentation protocol for VA dermatology departments to follow based on the photographic standards outlined by the American Society for Dermatologic Surgery.⁹

CASE 1 PRESENTATION

A 36-year-old traveling veteran who relocates frequently and receives care at multiple VA medical centers (VAMCs) presented for excision of a melanoma. The patient had been managed at another VAMC where the lesion was biopsied in September 2016. He presented to the Orlando, Florida, VAMC dermatology clinic 5 months later with the photographs of his biopsy sites along with the biopsy reports. The patient had 6 biopsies labeled A through F. Lesion A at the

right mid back was positive for melanoma (Figure 1), whereas lesion C on the mid lower back was not cancerous (Figure 2). On examination of the patient's back, he had numerous moles and scars. The initial receiving HCP circled and photographed the scar presumed to be the melanoma on the mid lower back (Figure 3).

On the day of surgery, the surgeon routinely checked the biopsy report as well as the photograph from the patient's most recent HCP visit. The surgeon noted that biopsy A (right mid back) on the pathology report had been identified as the melanoma; however, biopsy C (mid lower back) was circled and presumed to be the melanoma in the recent photograph by the receiving HCP—a nurse practitioner. The surgeon compared the initial photos from the referring VAMC with those from the receiving HCP and subsequently matched biopsy A (melanoma) with the correct location on the right mid back.

This discrepancy was explained to the patient with photographic confirmation, allowing for agreement on the correct site before the surgery. The pathology results of the surgical excision confirmed melanoma in the specimen and clear margins. Thus, the correct site was operated on.

CASE 2 PRESENTATION

A veteran aged 86 years with a medical history of a double transplant and long-term immunosuppression leading to numerous skin cancers was referred for surgical excision of a confirmed squamous cell carcinoma (SCC) on the left upper back. On the day of surgery, the biopsy site could not be identified clearly due to numerous preexisting scars (Figure 4). No photograph of the original biopsy site was available. The referring HCP was called to the bedside to assist in identifying the biopsy site but also was unable to clearly identify the site. This was explained to the patient. As 2-person confirmation was unsuccessful, conservative treatment was used with patient consent. The patient has since had

subsequent close follow-up to monitor for recurrence, as SCC in transplant patients can display aggressive growth and potential for metastasis.

CASE 3 PRESENTATION

A veteran was referred for surgical excision of a nonmelanoma skin cancer. The biopsy was completed well in advance of the anticipated surgery day. On the day of surgery, the site could not be detected as it healed well after the biopsy. Although a clinical photograph was available, it was taken too close-up to find a frame of reference for identifying the location of the biopsy site. The referring HCP was called to the bedside to assist in identification of the biopsy site, but 2-person confirmation was unsuccessful. This was explained to the patient, and with his consent, the HCPs agreed on conservative treatment and close follow-up.

DISCUSSION

To prevent and minimize poor outcomes associated with WSS, the health care team should routinely document the lesion location in detail before the biopsy. Many HCPs believe a preoperative photograph is the best method for documentation. As demonstrated in the third case presentation, photographs must be taken at a distance that includes nearby anatomic landmarks for reference. It is suggested that the providers obtain 2 images, one that is far enough to include landmarks, and one that is close enough to clearly differentiate the targeted lesion from others.¹⁰

Although high-resolution digital cameras are preferred, mobile phones also can be used if they provide quality images. As phones with built-in cameras are ubiquitous, they offer a quick and easy method of photographic documentation. St John and colleagues also presented the possibility of having patients keep pictures of the lesion on their phones, as this removes potential privacy concerns and facilitates easy transportation of information between HCPs.¹⁰ If it is discovered that a photograph was not taken at the time of biopsy, our practice contacts the patient and asks them to photograph and circle the biopsy site using their mobile phone or camera and bring it to the surgery appointment. We propose a

TABLE Recommended Protocol for Photographic Documentation of Biopsy Sites

Detailed prebiopsy documentation of lesion

Providers should obtain 2 images: 1 that is far enough to include landmarks and 1 that is close enough to clearly differentiate the targeted lesion from other nearby ones; photographs should be input in electronic health record; biopsy sites should be clearly labeled and provide identifying information

Self-identification—if it is discovered that a photograph was not taken at time of biopsy, the patient is contacted and asked to photograph and circle biopsy site and bring photograph to the surgery appointment

High-resolution digital camera photographs are preferred; cell phone photographs are acceptable if they are high quality and are able to meet the standards listed above

VA protocol for photographic documentation of biopsy sites (Table).

HCPs who are not comfortable with technology may be hesitant to use photographic documentation using a smartphone or camera. Further, HCPs often face time constraints, and taking photographs and uploading them to the EHR could decrease patient contact time. Therefore, photographic documentation presents an opportunity for a team approach to patient-centered care: Nursing and other medical staff can assist with these duties and learn the proper photographic documentation of biopsy sites. Using phone or tablet applications that provide rapid photographic documentation and uploading to the EHR also would facilitate universal use of photographic documentation.

If a HCP is uncomfortable or unable to use photography to document lesions, alternative strategies for documenting lesions exist, including diagrams, anatomic landmarks, ultraviolet (UV) fluorescent tattoos, and patient identification of lesions.¹⁰ In the diagram method, a HCP marks the lesion location on a diagram of the body preferably with a short description of the lesion's location and/or characteristics.¹¹ The diagram should be uploaded into the EHR. There are other methods for documenting lesion location relative to anatomic landmarks. Triangulation involves documenting distance between the lesion and 3 distinct anatomic locations.¹⁰ UV fluorescent tattooing involves putting UV tattoo dye in the biopsy site and locating the dye using a Wood lamp at the

time of surgery. The lamp was used in a single case report of a patient with recurrent basal cell carcinoma.¹² Patient identification of lesions by phone applications that allow patients to track their lesion, a phone selfie of the biopsy site, or a direct account of a lesion can be used to confirm lesion location based on the other methods mentioned.¹⁰

Patients often are poorly adherent to instructions aimed at reducing the risk of WSS. In a study that asked patients undergoing elective foot or ankle surgery to mark the foot not being operated on, 41% of patients were either partially or non-adherent with this request.¹³ Educating patients on the importance of lesion self-identification has the potential to improve identification of biopsy location and prevent WSS. Nursing and medical staff can provide patient education while photographing the biopsy site including taking a photograph with the patient's cell phone for their records.

Due to subsequent morbidity and mortality that can result from WSS, photographic confirmation of biopsy sites is a step that surgeons can take to ensure identification of the correct site prior to surgery. Case 1 provides an example of how photographs taken prior to biopsy can prevent WSS. In a disease such as melanoma, photographs are particularly important, as insufficient treatment can lead to fatal metastases. To increase quality of care, all available photographs should be reviewed, especially in cases where the pathology report does not match the clinical presentation.

If WSS occurs, HCPs may be hesitant to disclose their mistakes due to potential lawsuits, the possibility that disclosure may inadvertently harm the patient, and their relative inexperience in and training regarding disclosure skills.¹⁴ Surgeons who perform WSS may receive severe penalties from state licensing boards, including suspension of medical license. Financially, many insurers will not compensate providers for WSS. Also, many incidents of WSS result in a malpractice claim, with about 80% of those cases resulting in a malpractice award.¹⁵ However, it is important that HCPs are open with their patients regarding WSS.

As demonstrated in case presentations 2 and 3, having 2-person confirmation and patient confirmation before to surgery is important in preventing WSS for patients who have poor documentation of biopsy sites. In cases where agreement is not achieved, HCPs can consider several other options to help identify lesions. Dermabrasion and alcohol wipes are options.¹⁰ Dermabrasion uses friction to expose surgical sights that have healed, scarred, or been hidden by sun damage.¹⁰ Alcohol wipes remove surface scale and crust, creating a glisten with tangential lighting that highlights surface irregularities. Anesthesia injection prior to surgery creates a blister at the location of the cancer. This is because skin cancer weakens the attachments between keratinocytes, and as a result, the hydrostatic pressure from the anesthesia favorably blisters the malignancy location.^{10,16}

Dermoscopy is another strategy shown to help identify scar margins.^{10,17} Under dermoscopy, a scar demonstrates a white-pink homogenous patch with underlying vessels, whereas basal cell carcinoma remnants include blue-gray ovoid nests and globules, telangiectasias, spoke wheel and leaflike structures.¹⁷ As a final option, HCPs can perform an additional biopsy of potential cancer locations to find the lesion again.¹⁰ If the lesions cannot be identified, HCPs should consider conservative measures or less invasive treatments with close and frequent follow-up.

CONCLUSIONS

The cases described here highlight how the lack of proper photographic documentation can prevent the use of curative surgical treatment. In order to reduce WSS and improve quality care, HCPs must continue to take steps and create safeguards to minimize risk. Proper documentation of lesions prior to biopsy provides an effective route to reduce incidence of WSS. If the biopsy site cannot be found, various strategies to properly identify the site can be employed. If WSS occurs, it is important that HCPs provide full disclosure to patients. With a growing emphasis on patient safety measures and advances in technology, HCPs are becoming increasingly cognizant about

the most effective ways to optimize patient care, and it is anticipated that this will result in a decrease in morbidity and mortality.

Author disclosures

The authors report no actual or potential conflicts of interest with regard to this article.

Disclaimer

The opinions expressed herein are those of the authors and do not necessarily reflect those of *Federal Practitioner*, Frontline Medical Communications Inc., the US Government, or any of its agencies.

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