Factors associated with biopsy site identification, postponement of surgery, and patient confidence in a dermatologic surgery practice

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Background: Biopsy site identification is critical to avoid wrong-site surgery and may impact patient-centered outcomes.

Objective: We sought to evaluate risk factors for biopsy site misidentification, postponement of surgery, and patient confidence in surgical site selection and to assess the near-miss rate for wrong-site surgeries.

Methods: This was a prospective observational cohort study.

Results: Near-miss wrong-site surgeries were detected and averted in 1.3% (3 of 239) of patients with biopsy site photographs. Risk factors for biopsy site misidentification by patients were 6 weeks or longer between biopsy and surgery (odds ratio [OR] 2.19, 95% confidence interval [CI] 1.12-4.27; $P = .028$) and patient inability to see biopsy site (OR 3.95, 95% CI 1.50-10.37; $P = .002$). Risk factors for physician misidentification were 6 or more weeks between biopsy and surgery (OR 3.68, 95% CI 1.40-9.66; $P = .007$) and biopsy specimens from multiple sites (OR 4.39, 95% CI 1.67-11.54; $P = .003$). Postponement of surgery was associated with absence of a biopsy site photograph (OR 12.5, 95% CI 2.79-62.21; $P < .001$). Patient confidence in surgical site identification was associated with the presence of a biopsy site photograph (OR 5.48, 95% CI 1.96-15.30; $P = .001$).

Limitations: This was a single-site observational study.

Conclusion: Biopsy site photography is associated with reduced rates of postponed surgeries and improved rates of patient confidence in surgical site selection. Risk factors for biopsy site misidentification should be considered before definitive treatment. (J Am Acad Dermatol 2016;74:1185-93.)

Key words: biopsy; excision; identification; Mohs; photograph; skin cancer; wrong-site surgery.

Reliable biopsy site identification is critical for appropriate treatment of cutaneous neoplasms. Wrong-site surgery is the most common reason for malpractice claims against Mohs surgeons,[1] and it is the most frequent serious error reported in a recent survey of dermatologists.[2] However, patient and physician identification of the original biopsy site is often incorrect.[3-6] Although several risk factors for incorrect biopsy site identification have been proposed, the only published, evidence-based predictor is whether the site is visible to the patient.[4]

Given the known challenge of biopsy site identification, a consensus conference composed

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of dermatology experts was convened to guide best practices when faced with this common clinical challenge. Taking a high-quality photograph at the time of biopsy with at least 1 visible anatomic landmark achieved "strong" consensus.[7] In addition, when surveyed, dermatologic surgeons expressed a preference for biopsy site photography as the best method to document a biopsy site.[3]

This study presents data obtained during a quality improvement initiative during the implementation of routine biopsy site digital photography in an outpatient academic dermatology practice. Clinical risk factors for incorrect biopsy site identification were evaluated. In addition, risk factors for postponement of surgery (because of the inability to confidently identify the biopsy site) and factors associated with patient confidence that the correct site was treated were explored. Finally, we report the observed rate of near-miss wrong-site surgeries detected and averted when a biopsy site photograph was available.

CAPSULE SUMMARY

- Biopsy site identification is prone to error, which can lead to wrong-site surgery.
- Longer intervals between biopsy and surgery, multiple biopsy sites, and patient difficulty visualizing the biopsy site were associated with increased rates of biopsy site misidentification.
- Providers should be cognizant of risk factors for biopsy site misidentification before administering definitive treatment.

METHODS

A prospective observational consecutive cohort study of patients referred for surgical treatment of biopsy-proven cutaneous neoplasms to the dermatologic surgery unit at Penn Dermatology at Bucks County in Yardley, PA, was conducted between October 8, 2014, and March 4, 2015. All patients were treated by a single Mohs surgeon (J. R. E.), and the majority of referrals (>98%) were internal at the time of this quality improvement initiative.

Consecutive patients older than 18 years were asked to participate in the quality improvement initiative. Patients with multiple visits during this time period were only asked to participate once. Exclusion criteria for the project included patients younger than 18 years, those without a biopsy-proven cutaneous neoplasm, and those who could not provide informed consent. This study was exempted from review by the institutional review board of the University of Pennsylvania as a quality improvement initiative.

The biopsy site identification procedure is outlined and described in Fig 1. Briefly, the patient identified where their original biopsy site was located. Patients were permitted to use the input of persons accompanying them and the aid of a mirror or multiple mirrors to help identify their biopsy sites. The biopsy site was not physically marked by the patient before the physician entering the room. The physician then entered the room, reviewed the medical record (pathology reports, progress notes, and diagrams), consulted with the patient, and then performed a focused physical examination aided by ×2.5 loupe magnification. The patient demonstrated where they thought the original biopsy site was located by pointing to the site with their finger or a cotton-tipped applicator, and the physician identified the location that he (J. R. E.) suspected was the original biopsy site with a surgical marking pen. Only after the patient and physician had identified sites that they suspected were the original biopsy site was the medical record reviewed for a biopsy site photograph. All photographs from internal referrals were reviewed as color images embedded within the electronic medical record. Before starting surgery, the biopsy site was reconfirmed with the patient and physician looking at the marked location with or without the aid of a mirror.

Rates of patient and physician error in identifying the correct biopsy site were recorded. Reasons for incorrect site identification (inability to identify any biopsy site or incorrect biopsy site identified) were noted. Physician-patient agreement was recorded. If a photograph was available, the photograph was considered the gold standard for biopsy site identification. If a photograph was absent and the patient and physician agreed on the site, this was considered the correct biopsy site. If the patient and physician disagreed or there was uncertainty, the location marked by the referring provider after consultation was considered the correct site. The frequency of inadequate photographs and the reason for a photograph being deemed inadequate was also recorded. Near-miss wrong-site surgery was defined as when the patient and surgeon identified the same suspected anatomic location, and the photograph showed a different location. In these near-miss instances, the suspicious site that was agreed on by the patient and provider but disputed by the photograph was biopsied.