

# Anesthetic Blister Induction to Identify Biopsy Site Prior to Mohs Surgery

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**Background:** *Wrong-site surgery in dermatology often occurs due to difficulty finding the initial biopsy site prior to Mohs surgery. Patients frequently present for Mohs surgery weeks to months following the initial biopsy site. Visualization of the biopsy site may become difficult at presentation due to healing.*

**Objective:** *To investigate the utility of anesthetic blister induction at a suspected biopsy site to identify the location prior to Mohs surgery. The proposed technique is visualization of a blister that is induced by local anesthetic administration at the proposed biopsy site. The addition of this technique among others such as curettage, dermoscopy, and UV fluorescence can prevent wrong-site surgery.*

**Methods:** *A biopsy site of a squamous cell carcinoma on a patient was compared via photography for visibility at the time of initial biopsy, weeks following biopsy, and post-anesthetic blister induction.*

**Results:** *The biopsy site was easier to locate with the assistance of a blister that formed as a result of local anesthetic administration.*

**Conclusion:** *Blister induction by local anesthetic administration can assist in accurately identifying healed or obscured biopsy sites.*

## Anesthetic Blister Induction to Identify Biopsy Site Prior to Mohs Surgery

**W**rong-site surgeries in dermatology are not uncommon due to difficulty finding the initial biopsy site. In fact, a survey of Mohs surgeons indicated that 14% of malpractice cases resulted from wrong-site surgery.<sup>1</sup> The Mohs surgeon may be unable to determine the surgical site if the referring physician does not include detailed documentation, such as a photograph, diagram, or written description of the biopsy site including anatomical landmarks as reference.<sup>2</sup> However, patients often return for Mohs surgery many weeks following the initial biopsy. By this time, the biopsy site has healed and become less visible to both patient and physician, making it dif-

ficult even with proper documentation. Patients themselves may have incorrect site recall, particularly if the biopsy was in a location not visible to the patient.<sup>2</sup> A study by Perri et al revealed that 31.4% of patients could not accurately identify their biopsy site.<sup>4</sup> Despite these attempts to decrease wrong-site surgery, further techniques are exigent in confirming the surgical site.

Dermoscopy is one such technique that helps visualize the scarring and telangiectasias from a prior biopsy site.<sup>5</sup> Ultra-violet-fluorescent tattoo dyes is another method that allows visualization of a biopsy site under a Wood's lamp, even 14 months after biopsy.<sup>6</sup> Finally, curettage takes advantage of the friable nature of skin cancers, revealing the biopsy site upon scraping the suspected area.<sup>7</sup> The proposed technique of blister induction through intradermal anesthetic injection also takes advantage of the inherent nature of skin cancer.

“Upon injection of local anesthetic, blister formation was developed in the initial biopsy site, clearly depicting our surgical location.”

In skin cancer, keratinocytes lack the cohesion to one another that is normally found in unaffected skin. This is due to increased cell turnover, with rapid proliferation and decreased desmosomal attachments, in addition to a looser stroma allowing tumor cells to separate easier. This objective finding provides advantageous identification of presurgical margins, which can be recognized by curettage or in this method by blister formation secondary to anesthetic injection followed by curettage debulking. Upon injection of an anesthetic prior to Mohs surgery, a blister forms as a result of the hydrostatic pressure that accumulates within the cancerous skin. Desmosomal attachments, structure, and function are limited in malignant processes, therefore the anesthetic blister is not time sensitive and ensues initially upon injection administration. In our case study this patient presented with a clearly identifiable neoplasm, which was biopsied and histologically diagnosed as a squamous cell carcinoma (Figure 1). Subsequently, the patient was scheduled for Mohs surgery. On presentation for the surgical procedure, the initial biopsy site was not clearly identifiable and delayed initiation of treatment (Figure 2). It is apparent that identification of the prior surgical site is obscured for various reasons as mentioned above. Upon injection of local anesthetic, blister formation was developed in the initial biopsy site, clearly depicting our surgical location. (Figure 3). This is a clear example of how a new technique of blister formation

**FIGURE 1.** Squamous cell carcinoma. Visible biopsy site immediately following initial biopsy.



**FIGURE 2.** Squamous cell carcinoma. Healed biopsy site weeks later on return visit for Mohs surgery.



**FIGURE 3.** Squamous cell carcinoma. Blister formation induced by local anesthetic injection at suspected biopsy site.



secondary to anesthetic injection can highlight what may be an obscure operative site. The bulla formation induced amongst the weakly adherent malignant keratinocytes allows operation site identification with higher degree of certainty. In our experience and anecdotal data, bulla formation prior to Mohs surgery has increased pre-operative surgical site identification, as evident in our presented surgical case, which was confirmed with frozen sections upon Mohs surgery. Formation of a blister prior to Mohs surgery could therefore be used to help prevent wrong-site surgery.

In conclusion, without confirmation of the biopsy site Mohs surgery should not be performed in order to avoid wrong-site surgery. Rescheduled surgeries may cause lack of patient follow-up and consequently possible medical management neglect and metastasis or growth of tumor.<sup>8</sup> Through the use of many available means to confirm biopsy site location, dermatologists can prevent unneeded delay and damage to the patient. As various methods develop and provide assistance in Mohs surgery, we describe preoperative bulla formation as an additional or adjunctive tool to surgical site identification.

### Disclosure

The authors have no conflicts of interest.

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