THE JOURNAL OF FAMILY PRACTICE

9 tips to help prevent derm biopsy mistakes

The authors—with expertise in dermatology and pathology—provide pointers that can help you improve your approach to skin biopsy.

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The authors reported no potential conflict of interest relevant to this article.

PRACTICE RECOMMENDATIONS

› *Use an excisional biopsy for a melanocytic neoplasm.* (C)

› *Choose a punch biopsy over a shave biopsy for rashes.* (B)

› *Properly photograph and document the location of all lesions before biopsy.* (A)

› *Provide the pathologist with a sufficient history, including the distribution and appearance of the lesion, and how long the patient has had it.* (A)

Strength of recommendation (SOR)

(A) Good-quality patient-oriented evidence

(B) Inconsistent or limited-quality patient-oriented evidence

(C) Consensus, usual practice, opinion, disease-oriented evidence, case series

Most physicians do a satisfactory job in choosing when and how to do a skin biopsy, but there is always room for improvement. The 9 pointers we provide here are based on standard of care practices and literature when available, and also on our collective experiences as a pathologist/dermatologist (JM), dermatopathologist (DZ), primary care physician (BR), and dermatologist/Mohs surgeon (EB).

1 Choose your biopsy type wisely.

Using the appropriate type of biopsy can have the greatest effect on a proper diagnosis. The decision of which biopsy type to use is not always easy. The most common biopsy types are shave, punch, excisional, and curettage. Several reference articles detail each type of biopsy commonly used in primary care and how to perform them.[1,2] (For a series of how-to videos that illustrate how to perform some of these biopsies, visit *The Journal of Family Practice* Multimedia Library at http://www.jfponline.com/multimedia/video.html.)

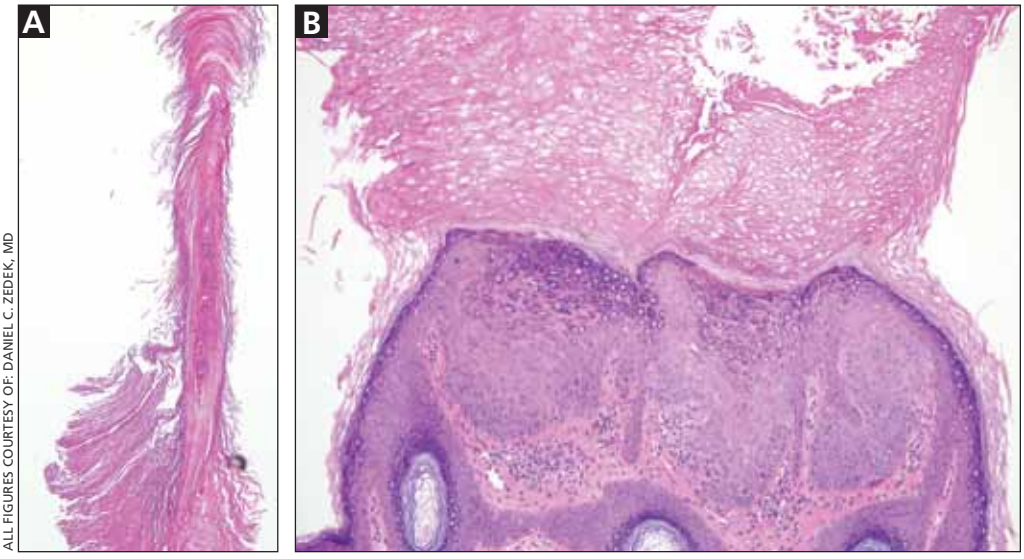
Each type of biopsy has inherent advantages and disadvantages. In general, the shave biopsy is most commonly used for lesions that are solitary, elevated, and give the impression that a sufficient amount of tissue can be sampled using this technique. The punch biopsy is the biopsy of choice for most "rashes" (inflammatory skin disorders).[2] Excisional biopsy is used to remove melanocytic neoplasms or larger lesions. And curettage, while still used by some clinicians for melanocytic lesions because of its speed and simplicity, should almost never be used for diagnostic purposes. Each of these techniques is described in greater detail in the tips that follow.

2 When performing a shave biopsy, avoid obtaining a sample that's too superficial.

The advantage of the shave biopsy is that it is minimally inva-

FIGURE 1

Sufficient tissue sampling makes all the difference



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A superficial biopsy (**A**) reveals little diagnostic material. A deeper biopsy of the same lesion (**B**) reveals findings that are characteristic of a wart.

An advantage of the punch biopsy is that patients are left with linear scars, rather than the round scars that are often associated with shave biopsy.

sive and quick to perform. If kept small while not compromising the amount of sample retrieved, the scars left by shave biopsies have the potential to blend well. The major disadvantage of the shave biopsy is that occasionally, if the shave is not deep enough, an insufficient amount of tissue is obtained, which can make it challenging to establish an accurate diagnosis.

Balancing the need to obtain adequate tissue while minimizing scarring takes skill and experience. Taking a biopsy that is inadequate is a common occurrence. At times, the physician's clinical impression may be that a biopsy has obtained adequate tissue, but histologically only the superficial part of the skin surface has been sampled. This often is because of thickening of the superficial skin, whether as a manifestation of the anatomic site (eg, acral skin) or the disease process itself.

Unfortunately, this superficial skin often is nondiagnostic when unaccompanied by underlying epidermis and dermis. It is important to keep this in mind when obtaining a skin biopsy, especially when dealing with lesions that are very scaly or keratinized. An equivocal biopsy wastes time, energy, and money, and can negatively impact patient care.[3] It can be difficult to balance practical aspects of the biopsy (ie, optimizing cosmetic outcomes, minimizing scarring and wound size) with the need to obtain sufficient tissue sampling (**FIGURE 1**).

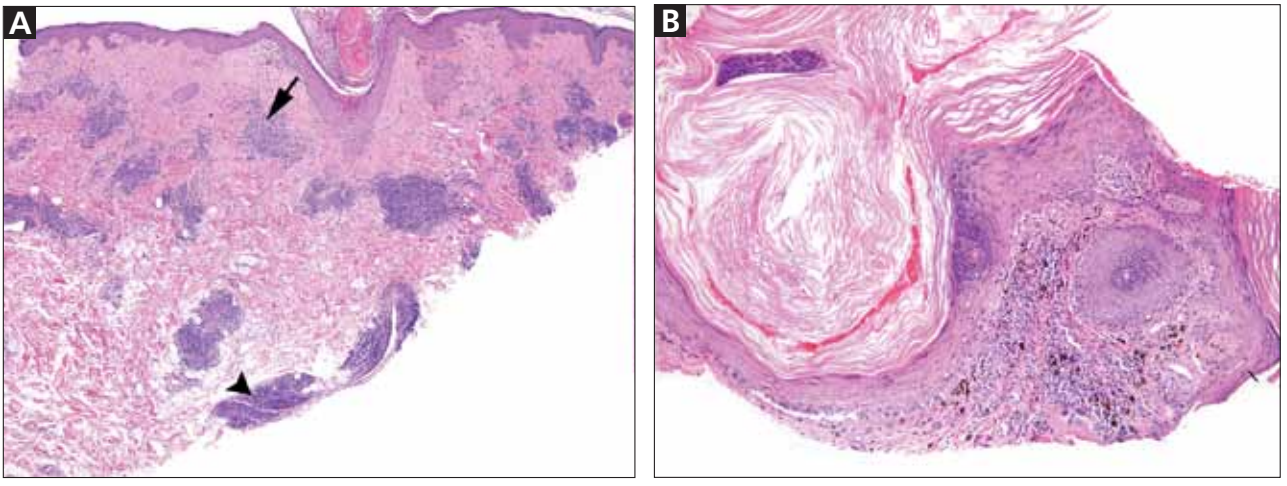
3 Choose punch over shave biopsy for rashes.

In a punch biopsy, a disposable metal cylinder with a sharpened edge is used to "punch" out a piece of skin that can be examined under the microscope. Punch biopsy is the preferred technique for almost all inflammatory skin conditions (rashes) because the pathologist is able to examine both the superficial and deep portions of the dermis[4] (**FIGURE 2**).

Pathologists use the pattern of inflammation, in conjunction with epidermal changes, to distinguish different types of inflammatory processes. For example, lichen planus is typically associated with superficial inflammation, while lupus is known to have prominent superficial *and* deep inflammation.

An inadequate punch biopsy sample can hinder histological assessment of inflammatory skin disorders that involve both the su-

FIGURE 2
Choose punch biopsy for rashes



For inflammatory skin conditions, a punch biopsy (**A**) can demonstrate superficial (arrow) and deep dermis (arrowhead) features of the skin, which can help establish a diagnosis, compared to a more superficial biopsy of the same lesion (**B**), which is more difficult to interpret. In this case, the presence of deep inflammation as seen in **A** is helpful in making the diagnosis of lupus.

perficial and deep portions of the dermis and can make arriving at a definitive diagnosis more challenging. The diameter of a punch cylinder ranges from 1 to 8 mm. Smaller punch biopsies often create diagnostic challenges because they provide so little sample. A punch biopsy size of 4 mm is commonly used for rashes.

An advantage of the punch biopsy is that patients are left with linear scars rather than round, potentially dyspigmented (darker or lighter) scars that are often associated with shave biopsy. A well-sutured punch biopsy can be cosmetically elegant, particularly if closure is oriented along relaxed skin tension lines. For this reason, punch biopsies are well suited for cosmetically sensitive locations such as the face, although shave biopsies are also often performed on the face.

4 Choose an excisional biopsy for a melanocytic neoplasm, when possible.

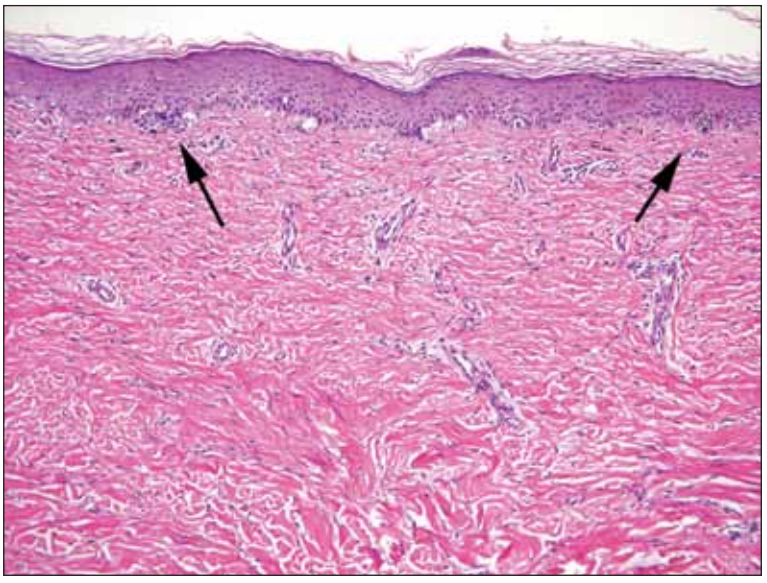
The purpose of an excisional biopsy (which typically includes a 1 to 3 mm rim of normal skin around the lesion) is to completely remove a lesion. The excisional biopsy generally is the preferred technique for clinically atypical melanocytic neoplasms (lesions that are not definitively benign).[4-8]

When suspicion for melanoma is high, excisional biopsies should be performed with minimal undermining to preserve the accuracy of any future sentinel lymph node biopsy surgeries. Excisional biopsy is the most involved type of biopsy and has the largest potential for cosmetic disfigurement if not properly planned and performed. While guidelines from the American Academy of Dermatology state that "narrow excisional biopsy that encompasses [the] entire breadth of lesion with clinically negative margins to ensure that the lesion is not transected" is preferred, they also acknowledge that partial sampling (incisional biopsy) is acceptable in select clinical circumstances,[9] such as when a lesion is large or on a cosmetically sensitive site such as the face.[10]

While a larger punch biopsy (6 or 8 mm) or even deep shave/saucerization *may* function as an excisional biopsy for very small lesions, this approach can be problematic. For one thing, these biopsies are more likely than an excisional biopsy to leave a portion of the lesion in situ. Another concern is that a shave biopsy of a melanocytic lesion can lead to error or difficulty in obtaining the correct

FIGURE 3

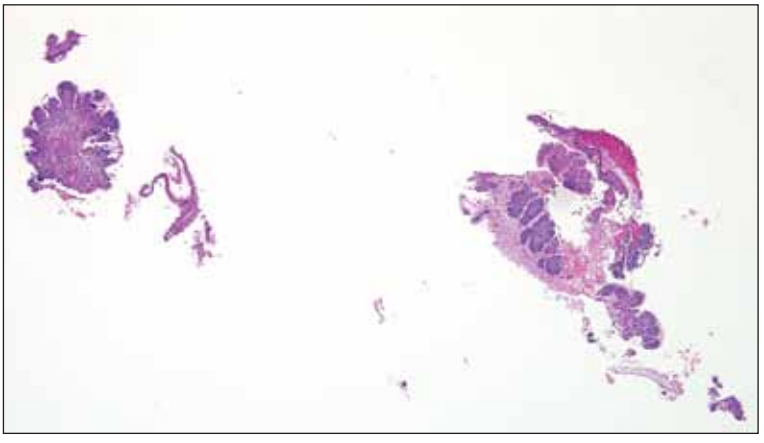
Worrisome or not?



Melanocytic proliferation at a previous biopsy site (arrows) can be very difficult to differentiate from more threatening melanocytic hyperplasia or lentiginous melanoma without appropriate history. In this case, the melanocytic proliferation shown is benign.

FIGURE 4

The downside of curettage



Curettage destroys the architecture of the lesion's tissue, which can make it difficult to establish a proper diagnosis, and should be avoided for taking a biopsy of a melanocytic lesion. In this sample, the ability to assess the architecture of the tissue was lost because the specimen is fragmented and discontinuous. For some types of lesions, this can make diagnosis difficult.

diagnosis on later biopsy.[11] For pathologists, smaller or incomplete samples make it challenging to establish an accurate diagnosis.[12] Among melanomas seen at a tertiary referral center, histopathological misdiagnosis was more common with a punch or shave biopsy than with an excisional biopsy.[9]

It has been shown that partial biopsy for melanoma results in more residual disease at wide local excision and makes it more challenging to properly stage the lesion.[13,14] If a shave biopsy is used to sample a suspected melanocytic neoplasm, it is imperative to document the specific site of the biopsy, indicate the size of the melanocytic lesion on the pathology requisition form, and ensure that all (or nearly all) of the clinically evident lesion is sampled. Detailing the location of the lesion in the chart is not only essential in evaluating the present lesion, but it will serve you well in the future. Without knowing the patient's clinical history, benign nevi that recur after a prior biopsy can be difficult to histologically distinguish from melanoma (**FIGURE 3**). For more on this, see tip #7.

5 Be careful with curettage.

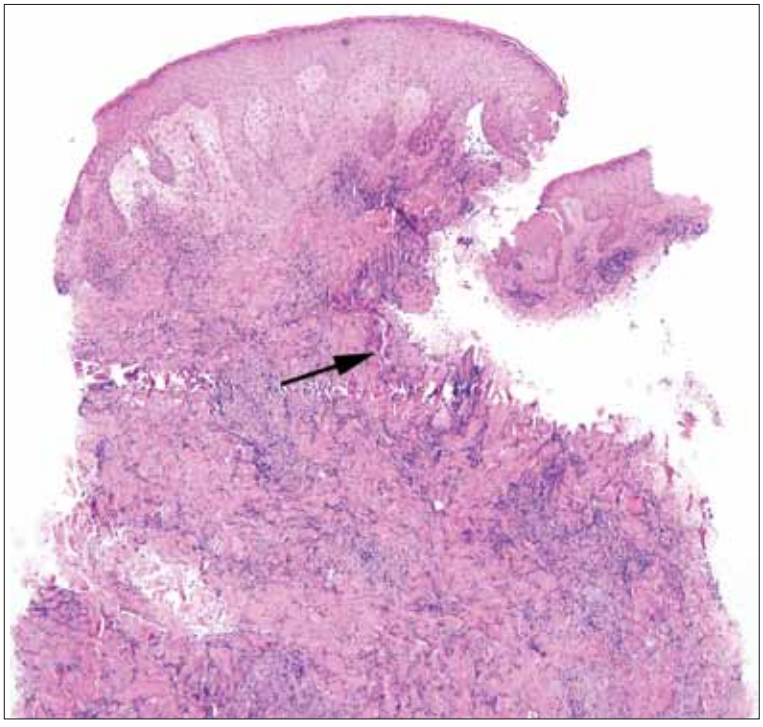
Curettage is a biopsy technique in which a curette—a surgical tool with a scoop, ring, or loop at the tip—is used in a scraping motion to retrieve tissue from the patient. This type of biopsy often produces a fragmented tissue sample. Its continued use reflects the speed and simplicity with which it can be done. However, curettage destroys the architecture of the tissue of the lesion, which can make it difficult to establish a proper diagnosis, and therefore is best avoided when performing a biopsy of a melanocytic lesion (**FIGURE 4**).

6 Remember the importance of proper fixation and processing.

As obvious as it may sound, it is important to remember to promptly place sampled tissue in an adequate amount of formalin so that the tissue is submersed in it in the container.[15] Failure to do so can result in improper fixation and will make it difficult to render an appropriate diagnosis. Conventionally, a 10:1 formalin volume to tissue volume ratio is recommended. If the "cold time"—the amount of time a tissue sample is out of formalin—is long enough (greater than a few hours), an appropriate assessment can be impossible.

Appropriate fixation and fixation times are important because molecular testing is being increasingly used to make pathological diagnoses.[16] Additionally, aggressively manipulating a biopsy sample while extracting it or placing it in formalin can cause "crush" artifact, which can limit interpretability (**FIGURE 5**).

FIGURE 5
Handle samples with care…



Aggressive manipulation of a biopsy sample while extracting it or transferring it to formalin can cause "crush" artifact (arrow), which can limit its interpretability.

7 Properly photograph and document the biopsy location.

When performing a biopsy of a suspicious neoplasm, physicians often remove all of the lesion's superficial components, which means that at the patient's follow-up appointment and subsequent treatments, only a well-healed biopsy site will remain. The biopsy site may be so well healed that it blends seamlessly into the surrounding skin and is nearly impossible for the physician to identify. This problem is seen most often when patients present for surgical excision or Mohs micrographic surgery.[17]

To properly record the site of a biopsy for future dermatologic exams, take pictures of the lesion at the time of biopsy. The photographs should clearly document the lesion in question, and should be taken far enough from the site that surrounding lesions and/or other anatomic landmarks are also visible. Biangulation or triangulation (taking a series of 2 or 3 measurements, respectively, from the site of the lesion to nearby anatomic landmarks) can be used in conjunction with photographs.

When using measurements, be as specific and accurate as possible with anatomic terms. For example, measuring the distance from the "ear" is not helpful. It would be more helpful to measure the distance from the "tragus" or the "root of the helix." Without a properly photographed and documented biopsy site, surgical treatment may need to be delayed until the location can be confirmed.

8 Give the pathologist a pertinent history.

Providing the pathologist with a sufficient history, including the distribution and appearance of the lesion, and how long the patient has had it, can be essential in narrowing the diagnosis or making the differential diagnoses. Things like medication use or new exposures to perfumes, lotions, or plants can be especially helpful and are often overlooked when filling out the pathology requisition form.

When warranted, phone calls are helpful. You might, for example, call the pathologist and give him or her a more detailed physical examination description or additional pertinent history that was discovered after the requisition was filled out. Providing a good history can make the difference between a specific diagnosis and a broad differential.

9 Know when to refer.

There is no shame in asking for a second opinion when it comes to evaluating

a skin issue, especially in regards to melanocytic neoplasms, where the stakes can be high, or skin eruptions that do not respond to conventional therapy. Remember, many cases are difficult, even for experts, and require a careful balance of clinical and histopathological judgment.[18] JFP

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