Skin biopsy, which is essential in the management of many disorders, can be performed effectively and safely in the office.1-3 Each of the methods—punch, shave, and excision—offers its own advantages and yields unique information.1,2,4-10 These techniques are easily learned and, with experience, you will become skilled in choosing the procedure best suited for each indication (Table).

Properly performed biopsy of an inflammatory dermatosis can provide useful information when you have narrowed down the differential diagnosis.7 Cutaneous neoplasms also should undergo biopsy, since the discovery of a malignancy influences the required surgical treatment. Routine biopsy of all rashes is not recommended, however, because the nonspecific pathologic results commonly reported will rarely alter clinical management.

The major goal of any biopsy procedure is the correct identification of a tissue process. Your proper selection of the biopsy site and technique, performance of the procedure, and handling of the specimen all assist the pathologist in furnishing you with useful information.

In this, the first of two articles describing office biopsy techniques, I will discuss selection of the biopsy site, preparation for the procedure, and performance of punch biopsy. In a second article, to appear in a coming issue of CONSULTANT, I will consider shave and excision biopsies, handling

Key words: skin biopsy, punch biopsy

Figure 1 – Flaccid blisters of pemphigus vulgaris rupture easily and leave painful erosions, as seen here. (Courtesy of Noah S. Scheinfeld, MD, JD.)
Figure 2 – These plaques on the back of a man’s neck are discoid lupus erythematosus.
(Courtesy of Robert P. Bleréau, MD.)

Table – Types of biopsy and indications

<table>
<thead>
<tr>
<th>Type of biopsy</th>
<th>Indications</th>
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<tbody>
<tr>
<td>Punch</td>
<td>Most superficial inflammatory diseases (eg, erythema multiforme major)</td>
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<td></td>
<td>Papulosquamous disorders (eg, psoriasis)</td>
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<td></td>
<td>Connective-tissue disorders (eg, SLE)</td>
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<td>Most superficial bullous diseases (eg, pemphigus)</td>
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<td>Benign tumors</td>
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<td>Granulomatous diseases (eg, sarcoidosis)</td>
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<td></td>
<td>Nonmelanotic malignant tumors (eg, infiltrating squamous cell carcinoma)</td>
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<td>Shave</td>
<td>Raised lesions (eg, skin tags)</td>
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<td></td>
<td>Lesions that separate easily from deeper skin (eg, seborrheic keratoses)</td>
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<td></td>
<td>Dome-shaped nevi and benign tumors</td>
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<td></td>
<td>Nonmelanotic malignant tumors (eg, superficial basal cell carcinoma)</td>
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<td>Excision</td>
<td>Subcutaneous or deep dermal tumors</td>
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<td>Deep inflammatory diseases (eg, erythema nodosum)</td>
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<td>Malignant melanoma</td>
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<td>Atypical pigmented lesions</td>
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SLE, systemic lupus erythematosus.
of biopsy specimens, and information required by the pathologist.

**FACTORS IN SELECTING A BIOPSY SITE**

Timing of a biopsy and selection of the site can influence the outcome. For vesiculobullous lesions, it is best to carry out biopsy early in the course of the disease in order to detect diagnostic histologic features (eg, of pemphigus [Figure 1] or dermatitis herpetiformis). Such diagnostic features may not develop for weeks in a chronic disease, such as discoid lupus erythematosus (Figure 2).

**Area to be sampled.** When multiple lesions or multiple skin sites are available for biopsy, select either an early lesion or one that is well developed. The area to be biopsied should be free from crusting, excoriation, fissuring, erosion, ulceration, and secondary infection. Sample larger lesions at areas of active disease, such as the edge of an expanding border.\(^1\)

**Avoiding complications.** In selecting a biopsy site, also bear in mind the healing characteristics of the particular site. When possible, avoid doing a biopsy on a cosmetically sensitive area, such as the face. Legs may heal slowly, especially those of elderly patients who have diabetes mellitus.\(^7\) Try to avoid performing a biopsy in the axilla or the groin because of the potential for infection at these sites. Remember that superficial arteries can be injured during deep facial biopsies at the temple, at the nasolabial fold where it intersects the alae, and near the supraorbital notch.\(^2\)

**Skin cancer.** Selection of biopsy sites within a suspected skin cancer may require special consideration. If you suspect a lesion might be a basal cell carcinoma, you can generally take biopsy specimens throughout, since most sections will yield representative tissue.\(^5\) If you suspect squamous cell carcinoma, obtain samples from the central, edge, and deep portions of the lesion.\(^5\)

Should you be unable to perform an excisional biopsy on a lesion suggestive of squamous cell carcinoma, a wedge of tissue taken from the edge inward usually will suffice.\(^5\) If you suspect melanoma, it is often best to remove the entire lesion by excisional biopsy technique.

**PREPARATION**

Cleanse the skin with an antimicrobial agent such as isopropyl alcohol, povidone-iodine solution, or chlorhexidine.\(^7\) Injection of a local anesthetic is usually required, but some shave biopsies can be performed immediately following the use of topical ethyl chloride. Topical application of a long-acting lidocaine and prilocaine cream also has been employed successfully.

Lidocaine, 1% or 2% with epinephrine, is the anesthetic generally selected for injection. Epinephrine improves wound hemostasis and prolongs the effect of the anesthetic. You can minimize the pain of administration by using a 30-gauge needle, buffering the acid anesthetic solution with bicarbonate, and injecting the anesthetic slowly into the deeper subdermal tissues. Discomfort varies directly with the amount of solution administered and the depth of injection.\(^1,4,7\)

You may use nonsterile gloves to administer local anesthesia and to perform all biopsy procedures except for excisional biopsy. The specific biopsy method selected determines the surgical instruments required.

**PUNCH BIOPSY**

This rapid and useful technique removes a cylindrical piece of full-thickness skin and can be employed to remove the entire lesion.
or just a portion. The circular cutting instrument used—a trephine—is made in 2- to 10-mm sizes, although the disposable 2- to 4-mm instruments are preferred. A smaller instrument creates a smaller scar but may not remove enough tissue for diagnosis.

Punch biopsy technique has the advantage of securing a specimen that extends to the level of fat. Thus, it enables identification of diseases such as sarcoidosis (Figure 3) and granuloma annulare (Figure 4), which show pathologic changes in the deeper dermis. The depth of biopsy can also be a disadvantage, since the full-thickness dermal wound tends to produce a round and slightly depressed scar.

**Technique.** First, determine the lines of least skin tension. Skin creases can be useful as a guide, although they do not always follow the lines of least skin tension. Pinching the skin can also help.

Then, using your nondominant hand, stretch the skin perpendicular to the lines of least skin tension; maintain this distention as you carry out the biopsy. Press the punch instrument vertically into the skin, twirling it clockwise and counterclockwise between your fingertips as it cuts down to the subcutaneous fat. You may note a small “give” as the instrument penetrates the deep (reticular) dermis.

Remove the instrument, and gently lift the specimen with the aid of a 25- or 27-gauge needle or a pair of fine, toothless Adson forceps, taking care not to crush the tissue. Avoid forceps with teeth. Using iris scissors, cut the elevated skin specimen free from the subcuticular tissue. Relax the distending hand; the biopsy site now appears as an elliptical defect.

**Closure.** The small punch biopsy wounds created by a 2- or 3-mm instrument often do not require suture closure. For these wounds, you can achieve hemostasis by applying aluminum chloride or ferric subsulfate solution. Then apply an antibiotic cream to promote healing, which will occur by secondary intention.

Larger punch biopsy sites heal with less scarring if the wound is closed with sutures. The elliptical defect, with its long axis oriented parallel to the lines of least skin tension, is easily closed with a 5-0 or 6-0 nylon suture.

**REFERENCES:**