Skin Biopsy Techniques: When and How to Perform Shave and Excisional Biopsy

ABSTRACT: Shave biopsies, which can be performed using a scalpel, a curette, scissors, or electrosurgery, are recommended for raised or pedunculated lesions. They often yield good cosmetic results, since the wound edges can be contoured to minimize scarring. These wounds heal by secondary intention, and sutures are not necessary. Shave biopsy is contraindicated for pigmented lesions that may prove to be melanomas. Fusiform excisional biopsy is performed for subcutaneous or deep dermal tumors, deep inflammatory processes, tumors requiring identification of the architectural features for diagnosis, and malignancies requiring evaluation of depth. Incisional or wedge biopsy uses fusiform excision technique and is done when the lesion cannot be completely removed.

THOMAS J. ZUBER, MD, MPH, MBA  
Brody School of Medicine, East Carolina University

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SHAVE BIOPSY

Historically, shave technique has been performed with many devices, including sharp dermal curette, flexible metal razor blade, scissors, electrosurgical wire loop, and No. 15 scalp blade. Shave biopsy is simple and has great practical value in office practice (Table).

Indications and contraindications. Shave biopsy is advocated for rapid removal of raised or pedunculated lesions. This technique enables easy removal of growths on protruding or convex surfaces (eg, the pinna and the nose), as well as numerous superficial lesions (eg, seborrheic keratoses [Figure 1], verrucae, nevi, actinic keratoses, and angiomas).

Cosmetic results are generally good, and suture closure is not required.

Most shave biopsies should be performed at the level of the deep dermis. Superficial skin lesions can be excised completely if you cut deeply enough, but the deeper the incision, the greater the likelihood of scarring. Proper shave technique often balances the need to remove all cells of a lesion with the desire not to cut too deeply. Should you unintentionally penetrate the fat, convert the wound to a standard excision and close with sutures.

Shave biopsy wounds heal by secondary intention. The cosmetic results can often be predicted by the skin surface surrounding the lesion. When this procedure is performed on concave surfaces of the nose, eye,
ear, and temple, the wounds often heal with nearly imperceptible scars. Shave biopsies performed on convex surfaces may result in round, hypopigmented scars.6

Do not use a shave biopsy to remove pigmented skin lesions in which melanoma is a concern.2,3 Shaving a melanoma precludes adequate measurement of the depth of invasion and interferes with prognostic determination and therapeutic planning.2 Furthermore, atypical histologic changes (“pseudomelanoma”) can develop in benign pigmented nevi following shave biopsy, which can result in excessive surgical intervention.3 If pigmented lesions have atypical features or cause you to suspect melanoma, remove them by the excisional biopsy technique described below.3

**Scalpel blade shave technique.** The most commonly performed shave biopsy technique employs a No. 15 scalpel blade.3,4,6,7,9 Depending on your preference, the blade can be used with or without a handle.3

If the lesion is flat, you can pinch it upward or inject the anesthetic underneath it, causing the lesion to float upward. The use of 2% lidocaine with epinephrine produces good anesthesia while limiting bleeding from the wound following the biopsy. Stretch and stabilize the skin with your nondominant hand (as for the punch biopsy), hold the scalpel blade horizontal to the skin, and insert it just outside the periphery of the lesion. Whenever possible, use a single, smooth cutting stroke.2 Long, unidirectional blade strokes will prevent the jagged surface resulting from a choppy, sawing motion.9

A bowed metal razor blade also can be used for shave biopsy, but some physicians consider this technique less desirable because of the risk that the blade might slip and the difficulty in maintaining tension on the blade while moving it beneath the lesion.

**Shave technique using curettage.** Shave biopsy can be performed with curettage (and subsequent electrodessication) to remove nonmelanoma skin cancers.3 Curettage effectively removes superficial lesions that can easily be separated from the skin (eg, molluscum contagiosum and seborrheic keratoses), but it is not widely advocated for skin biopsy because of its significant tissue injury to the biopsy specimen.7

**Scissor shave technique.** Many physicians believe that this technique gives them the best control of wound depth. The scissor shave biopsy easily and rapidly removes many elevated skin lesions (eg, cutaneous horns [Figure 2], filiform warts, keratoses, and small skin tags). Often, anesthesia is not required.9 This method is especially useful at sites where the skin is thin and the depth of the excision is crucial (eg, on the eyelid or the penis).

Carry out the scissor shave biopsy by lifting the lesion with the forceps, stabilizing and slightly elevating it with the tips of the scissors, and then cutting it off.9 Use just the tips of the scissors to avoid excising surrounding skin. Iris scissors are often selected to remove keratoses or condylomas of the penis.

**Electrosurgical shave technique.** In this fast and efficient technique, a fine wire loop is placed

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**Table – Types of biopsy and indications**

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<thead>
<tr>
<th>Type of biopsy</th>
<th>Indications</th>
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<tr>
<td><strong>Punch</strong></td>
<td>Most superficial inflammatory diseases (eg, erythema multiforme major) Papulosquamous disorders (eg, psoriasis) Connective-tissue disorders (eg, SLE) Most superficial bullous diseases (eg, pemphigus) Benign tumors Granulomatous diseases (eg, sarcoidosis) Nonmelanotic malignant tumors (eg, infiltrating squamous cell carcinoma)</td>
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<tr>
<td><strong>Shave</strong></td>
<td>Raised lesions (eg, skin tags) Lesions that separate easily from deeper skin (eg, seborrheic keratoses) Dome-shaped nevi and benign tumors Nonmelanotic malignant tumors (eg, superficial basal cell carcinoma)</td>
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<tr>
<td><strong>Excision</strong></td>
<td>Subcutaneous or deep dermal tumors Deep inflammatory diseases (eg, erythema nodosum) Malignant melanoma Atypical pigmented lesions</td>
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SLE, systemic lupus erythematosus.
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around the lesion. Grasping the lesion with Adson forceps, elevate it through the electrosurgical loop. Bring the loop against the base of the lesion and activate it, using a low-power, blended, high-frequency electrical current. Blended electrosurgical currents enable both tissue cutting and wound coagulation. Use a diamond-shaped loop to remove pedunculated lesions and a square or circular loop for more sessile, broad-based lesions.

One disadvantage of the blended-current electrosurgical shave technique is the propensity for increased scarring because of thermal injury from the coagulation current. In my practice, we use only a cutting current when removing skin lesions, to avoid deeper skin injury.

Performance of electrosurgical skin surgery requires proper equipment and training. Once you master this technique and learn the proper depth at which to perform the procedure, biopsy can be performed with good cosmetic results.

Achieving hemostasis. After a skin lesion is removed by shave technique, hemostasis can be achieved with topical application of aluminum chloride or ferric subsulfate (Monsel’s) solution. Both solutions are effective, but aluminum chloride can slow wound healing. Aluminum chloride has been advocated for facial wounds, because the use of Monsel’s solution may, in rare cases, result in iron deposition and tattooing. Many skin surgeons have used Monsel’s solution on facial wounds for years without experiencing difficulty. Following shave biopsy, instruct patients to apply an antibiotic ointment daily until the wound heals or to use transparent wound dressings, which can speed healing.

Contouring wound edges. Surgical scars are more noticeable when they cast a shadow or produce a color different from that of the surrounding skin. Following shave biopsy, many physicians prefer to contour, smooth, and blend the wound edges into the adjacent skin to eliminate both of these potential problems.

Electrosurgical “feathering” uses a low-power, high-frequency cutting current in a thin wire dermal loop and produces graded skin edges that blend into the surrounding tissue. Use short, rapid, superficial brush strokes, such as those used by a fine artist. When it is correctly performed, electrosurgical feathering can remove additional cells in the wound base without excising “divots” of tissue. Contouring is much easier to perform electrosurgically than with a scalpel.

Excisional Biopsy

Fusiform excisional biopsy of a skin lesion is commonly performed by primary care physicians. The disadvantages of this technique—increased time and the need for suture closure—are balanced by patients’ appreciation of good cosmetic results and the fact that one procedure often permits both diagnosis and treatment.

Excisional biopsy is indicated for subcutaneous or deep dermal tumors, deep inflammatory processes (eg, erythema nodosum [Figure 3]), and tumors for which identification is based largely on architectural features (eg, keratoacanthomas). Excisional biopsy is indicated for subcutaneous or deep dermal tumors, deep inflammatory processes (eg, erythema nodosum [Figure 3]), and tumors for which identification is based largely on architectural features (eg, keratoacanthomas).
dermine the skin containing the lesion down to the fat, just below the dermis, keeping the scalpel blade horizontal to the skin surface. Place the central skin island into a container of formalin for histopathologic assessment.

Using skin hooks or toothless forceps, gently grasp the lateral skin edges and undermine them with a blade or scissors. Skin edge relaxation requires 3 cm of lateral undermining for every 1 cm gained. Control bleeding beneath skin edges by using direct pressure, hemostat clamps, or electrocautery.

Deep subcuticular, interrupted, buried sutures ensure hemostasis, closure of “dead space,” and good wound edge approximation. Use 4-0 or 5-0 polyglactin absorbable sutures to reduce tension on the skin sutures and to maintain wound integrity long after the skin sutures are removed.

Everted skin edges provide the best cosmetic results. You can accomplish this by using 4-0, 5-0, or 6-0 nonabsorbable nylon sutures. Remove the skin sutures as early as possible, replacing them with skin tape. Many excellent sources provide additional details that describe proper excisional technique.1,3,5,10,11

**Incisional biopsy.** Incisional (wedge) biopsy can be performed on lesions that cannot be completely excised.2,11 Within a large lesion, for example, use fusiform excision technique and closure to obtain adequate tissue for histopathologic assessment. For giant congenital nevi, carry out incisional biopsy in central, nodular, dark, or suspicious-looking areas.2

**HANDLING OF BIOPSY SPECIMENS**

Handle biopsy specimens carefully to minimize crush injury and excess tissue drying that may interfere with histopathologic evaluation.2,6,7 If you are not sure what type of staining procedure will be required, consult with the pathologist beforehand to coordinate the handling of biopsy specimens. Tissue to be examined by light microscopy is generally fixed immediately in buffered neutral formalin. Pathologists often provide free specimen containers for transporting tissue. Label each with the biopsy site. When you need to perform several biopsies, mark the containers before you start to avoid confusion in identifying the tissues.2

Immunofluorescent staining may be necessary for evaluation of bullous skin diseases or lupus erythematosus. This requires special fixation techniques, and these biopsy specimens may need to be delivered to the laboratory in liquid nitrogen.

Provide a brief summary of the patient’s clinical history when you submit a biopsy specimen. This may guide the pathologist toward an appropriate differential diagnosis, especially if the microscopic findings are nonspecific. The pathology report should describe both the gross and cellular features of the tissue. If tumors are submitted, the report should include the degree of neoplastic activity, type of neoplasia, and involvement of surgical margins.

**REFERENCES:**