

Dermal Electrosurgical Shave Excision

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The dermal electrosurgical shave excision is a fast and inexpensive method of removing epidermal and dermal lesions. The procedure is ideally suited for pedunculated lesions raised above the level of the surrounding skin. It consists of repetitive, unidirectional, horizontal slicing of a cutaneous lesion with a no. 15 blade followed by electrosurgical feathering to smooth out the wound edges. A smoke evacuator is used during electrosurgery to prevent inhalation of heat-disseminated viral particles. The procedure is followed by histologic evaluation of the shaved specimen. Suspicious pigmented lesions should not be shaved because the long-term prognosis of a malignancy may depend on the thickness of the lesion on histologic analysis. Administration of adequate local anesthesia should make this a painless procedure. Basic general surgery skills are required, and formal training in electrosurgery is highly recommended. (Am Fam Physician 2002;65:1883-6,1889-90,1895,1899-900. Copyright © 2002 American Academy of Family Physicians.)

▶ A patient information handout on dermal electrosurgical shave excision is provided on page 1899.

Office Procedures forms on dermal electrosurgical shave excision are provided on pages 1889, 1890 and 1895.

This article is one in a series adapted from the Academy Collection book Office Procedures, written for family physicians, designed to provide the essential details of commonly performed in-office procedures and published by Lippincott Williams & Wilkins.

Shave excision describes the technique of sharp removal of epidermal or dermal lesions by horizontal slicing. Skin lesions can be removed by electrosurgical technique, conventional scissors, or scalpel shaving methods.

Shave excision usually extends to the level of the middle dermis, with the subcutaneous tissue left undisturbed. The shave biopsy is ideally suited for pedunculated lesions raised above the level of the surrounding skin. Skin lesions with a minimal dermal component, such as seborrheic keratoses or fibrous papules of the nose, are also excellent candidates for shave excision technique (Table 1). Pigmented nevi, subcutaneous lesions, and skin appendage lesions warrant the use of an alternative excision technique (Table 2).

It is essential when using the shave excision technique to go deep enough beneath the lesion to remove all of the cells of the growth to prevent recurrence. Generally, the deeper an excision extends into the dermis, the more scarring results. Fortunately, most excision sites heal with minimal postoperative scarring and pigmentary changes.

Electrosurgery refers to the cutting and coagulation of tissue using very high-frequency, low-voltage electrical currents. A blended current combines cutting and coagulation, and is useful in producing a bloodless operative field. Lesion excisions on the face are usually performed with only a cutting

current to limit scarring at the wound base, which can be produced by the effects of thermal coagulation. A clear chemical hemostatic agent, such as 85 percent aluminum chloride, can provide the necessary hemostasis.

TABLE 1
Lesions Amenable to Shave Excision

Acrochordon (skin tag)	Molluscum contagiosum
Angiofibroma	Nonpigmented nevi
Basal cell carcinoma (well-defined, small, low-risk area, primary)	Papilloma
Cutaneous horn	Rhinophyma
Dermatofibroma	Seborrheic keratosis
Fibrous papula	Stucco keratoses
Keratoacanthoma	Syringoma
	Venous lake
	Wart

TABLE 2
Lesions Best Considered for Alternative Excision Technique

Pigmented nevi (pathology specimen should be a full-thickness skin specimen down to the subcutaneous fat in the event the lesion is a melanoma)
Skin appendage lesions (syringomas, cylindromas, epidermoid cysts)
Subcutaneous lesions (may be missed by shave technique)

Dermal electro-surgical shave biopsy is ideally suited for the removal of pedunculated lesions that are raised above the level of the surrounding skin.

Inexperienced physicians often find it easiest to control the depth of excision by using a no. 15 blade held horizontal to the skin surface, which is then brought across the base of the lesion with long, unidirectional strokes.

Electrosurgical feathering (smoothing of the edges using fine brush strokes with the electrode) can then be performed to eliminate sharp wound edges and contour the wound to the surrounding skin. Feathering is generally performed only with an electro-surgical cutting current.

Dermal electro-surgical shave excision is a fast and inexpensive technique that does not require suture closure and is ideally suited for the busy physician because the setup and procedure can be performed rapidly. Electro-surgical generators on mobile carts can be moved into different examination rooms, facilitating performance of the procedure in the office setting.

Methods and Materials

PATIENT PREPARATION

The patient is seated (or lying) comfortably on the examination table with the skin lesion exposed.

EQUIPMENT

Nonsterile Tray for the Procedure

Place the following items on a nonsterile drape covering a Mayo stand:

Nonsterile gloves

A 5- or 10-mL syringe filled with 2 percent lidocaine (Xylocaine), with or without epinephrine, and a 30-gauge needle

No. 15 blade

1 inch of 4 × 4 gauze

4 × 4 gauze soaked with povidone-iodine solution

A small disposable plastic (medicine) cup containing povidone-iodine solution

12 small cotton-tipped applicators

A small disposable plastic (medicine) cup containing Monsel's solution

A small disposable plastic cup containing 85 percent aluminum chloride (if lesion is on the face)

Formalin container

Electrosurgical Cart

Electrosurgical generator

Smoke evacuator with a special small particle (viral) filtration system

Small dermal loop electrodes

Procedure Description

1. Place the patient in a comfortable seated or lying position on the examination table with the skin lesion exposed and illuminated. The lesion should be prepped with povidone-iodine solution and anesthetized with 2 percent lidocaine with epinephrine (5-mL syringe with a 30-gauge needle, or a 10-mL syringe if multiple lesions are to be removed). The lesion is raised with the administration of the anesthesia. The intradermal route of administration creates a blanch to the tissue that indicates the extent of anesthesia. Enough anesthesia should be administered to have a ring of anesthesia at least 1 cm from the lesion in all directions.

2. The area can be re-prepped with povidone-iodine solution. The initial shave can be performed with a no. 15 blade that the physician holds horizontal to the skin surface and moves beneath the lesion (*Figure 1*). Experienced physicians may choose to remove the lesion with the electro-surgical loop (*Figure 2*). After removal, the specimen is immediately placed in formalin. Bleeding from the wound base is controlled by using a cotton swab to apply Monsel's solution (ferric subsulfate) or, on the face, clear 85 percent aluminum chloride.

3. The smoke evacuator is turned on, and the assistant holds the tubing next to the skin lesion site. The smoke evacuator has a special filter that prevents the dispersion of viral particles such as human immunodeficiency virus (HIV) and human papillomavirus (HPV). The smoke evacuator should be used the entire time that electro-surgery is being performed.

4. Electro-surgical feathering is performed with a small dermal loop electrode, using electro-surgical cutting and a setting of 1.5 to 2 (*Figure 3*). The handpiece is held in the operator's dominant hand, and short strokes (like the strokes of a fine painter) are made with the side of the electrode over the wound edges. The operator's fifth finger rests on the nearby tissues, stabilizing the operator's hand. The feathering removes additional cells from the wound base while smoothing the wound edges and blending the final wound color into the surrounding tissue.

5. The physician can use a finger to feel the shave excision site to ensure that no edges remain. If an edge can be felt, additional electro-surgical feathering can be performed to smooth the surface.

6. Monsel's solution can be reapplied if any bleeding persists. An antibiotic ointment, such as Mycitracin Plus,

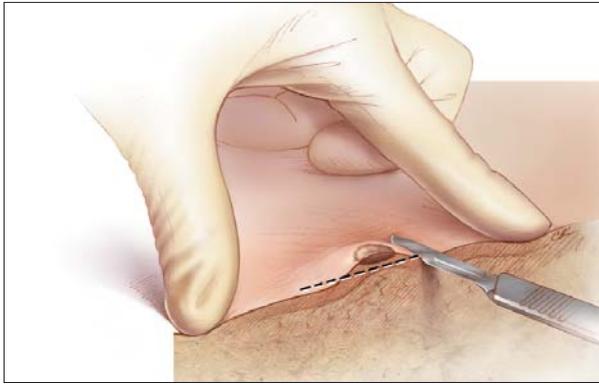


FIGURE 1. Shave biopsy technique. The blade is held horizontal to the skin surface and brought below the lesion while the nondominant hand is used to stretch and stabilize the skin surrounding the lesion during the shave biopsy. Smooth, unidirectional cutting with the blade separates the lesion above from the deep (reticular) dermis below.

which includes a topical anesthetic, can be applied. A bandage can be placed, and the patient is given the postprocedure instruction form.

Follow-Up

- Histologic evaluation of the shave specimen may report a wide variety of benign growths such as angiofibroma, skin tag, or dermatofibroma. If the evaluation of a benign growth reveals that the specimen margin was positive (some cells remained at the excision edge), the lesion can probably be closely followed. Re-excision of the site is generally performed only if regrowth of the tumor is noted at a later date.

- Shave excision specimens that reveal the margins to be positive for malignancy should prompt consideration for re-excision of the site. Some experts do not recommend automatic re-excision for basal cell carcinomas because of

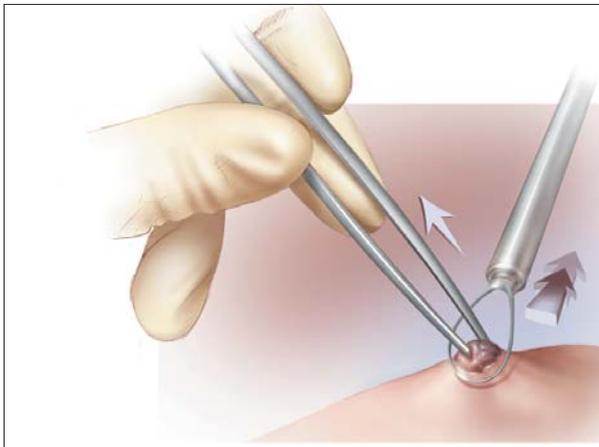


FIGURE 2. Electrosurgical loop technique. The lesion is grasped with forceps through the loop electrode. The electrode is activated going under the lesion, removing the growth.

Electrosurgical feathering removes additional cells from the wound base, while smoothing the wound edges and blending the final wound color into the surrounding tissue.

the superficial nature of these tumors. The electrosurgical shave excision technique also removes additional cells from the wound base, and this may prevent recurrence when the margin of the initial shave excision specimen margin is positive. Results from several studies have demonstrated that re-excision of basal cell carcinoma specimens with positive margins produces a high frequency of second specimens that have negative margins for malignancy. Basal cell carcinomas at low-risk sites, such as the cheek or neck, require close follow-up.

- If the histologic analysis of a shave excision specimen reveals squamous cell carcinoma, full thickness re-excision of the site is recommended to completely eradicate the potentially metastatic lesion.

- Ideally, a melanoma should never be shaved through because therapy and the long-term prognosis of the malignancy depend on the thickness of the lesion at histologic analysis. If a shaved excision specimen is reported to contain melanoma, consider referral to a subspecialist in skin cancer.

- Occasionally, patients develop an excessive reaction known as a hypertrophic scar. This complication is more common at sites that have excessive tension on the scar, such as over the sternum, over the shoulder, or over flex-

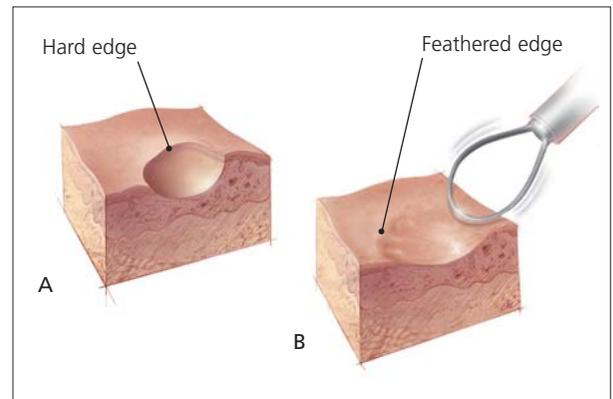


FIGURE 3. Smoothing shave biopsy sites. (A) Dermal electrosurgical shave excisions can result in circular, crater-like defects that produce a step-off creating shadowing and leaving a noticeable scar. Some surgeons advocate the smoothing of shave biopsy skin edges to blend the healing wound into the surrounding tissues. Electrosurgical cutting using a low power setting can be effectively performed with a thin wire dermal loop. (B) The technique of electrosurgical “feathering” involves rapid, short brush strokes to smooth the edges and create a more cosmetically acceptable result.

Dermal Shave Excision

A melanoma should never be shaved through because therapy and long-term prognosis of the malignancy depend on the thickness of the lesion at histologic analysis.

ion creases. Hypertrophic scars often shrink over time, and many experts advocate follow-up or treatment with single or multiple corticosteroid injections.

Procedure Pitfalls/Complications

- *Shaving Lesions on the Face Produces Very Noticeable Scars.* Scars on the face are usually noticeable because wound edges cast a shadow or because the final white scar is markedly different in color than the surrounding tissue. Electrosurgical feathering smooths sharp wound edges and gradually contours and grades the tissue from the wound base to the surrounding tissue. This contouring helps blend the final wound color into the surrounding tissue.

- *The Electrosurgical Shave Went Too Deep and Entered the Subcutaneous Fat.* The shave excision technique is an intradermal excision technique. Family physicians rarely cut into the subcutaneous tissue. If the physician unintentionally cuts into the subcutaneous fat, the procedure should be changed to a full-thickness excision performed with a sterile surgical tray and a sterile field.

- *The Shave Technique Was Used to Remove a Pigmented Nevi.* The shave excision technique should not be used for the removal of pigmented lesions that have any potential of being a melanoma. Melanomas rarely masquerade as a benign pigmented lesion, and a good rule to follow is to remove all pigmented lesions by full-thickness excision. The prognosis and treatment depend on the thickness of the lesion. A shave excision through a melanoma can prevent appropriate histologic identification.

- *Too Much Tissue Is Scooped Out When Excising the Lesion with the Loop Electrode.* Physicians who are inexperienced in performing the electrosurgical shave excision technique often remove too much tissue with the first pass of the loop electrode. To limit the scooping effect, some physicians find it easier to control the depth of the initial excision by using a no. 15 blade. The electrosurgical loop is then used to feather the edges, removing additional cells from the wound base and refining the final wound appearance.

- *During the Procedure the Patient Receives an Uninten-*

tional Burn. The physician must always be observing the electrode tip whenever the electrode is activated. A burn can occur if the electrode is activated while being held close to another part of the patient's skin.

- *The Patient Complains of Pain During the Feathering of the Wound Edges.* Adequate local anesthesia should be administered to prevent patient discomfort during the procedure. Electrosurgical feathering extends out from the wound base in all directions. Enough anesthetic should be infiltrated into the skin to produce a blanching that extends at least 1 cm from the lesion edge in all directions.

Physician Training

The mechanical techniques of dermal electrosurgical shave excision appear to be simple, but expertise in creating cosmetically superior wounds can take years to acquire. Electrosurgical feathering can be a highly difficult technique to master. Physicians in training should perform as many shave excision procedures as possible on nonfacial lesions. Once the fine hand motions have been mastered, removal of facial lesions can be attempted. It is recommended that physicians receive formal training in the use of electrosurgical currents, such as the courses in electrosurgery offered by the American Academy of Family Physicians.

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RESOURCES

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Informed Consent Form

Dermal Electrosurgical Shave Excision

Patient: _____

Date: _____

1. I hereby authorize Dr. _____ to perform the procedure known as the dermal electrosurgical shave excision.
2. I understand that this is a procedure performed under local anesthesia to remove skin growths or tumors. I understand that the doctor will attempt to remove the entire lesion to prevent regrowth, while also trying to optimize the final cosmetic result. I understand that this procedure usually yields acceptable scars, but that each person heals differently. I understand that the practice of medicine is not an exact science, and that no guarantee can be made regarding the outcome of my planned procedure.
3. My doctor has explained to me that this procedure is generally safe, but that certain risks accompany any surgical procedure. Risks associated with the dermal electrosurgical shave excision procedure include the following:
 - Bleeding from the surgical site
 - Unintentional burn to skin (either nearby or distant)
 - Damage to structures or tissues beneath the treatment site
 - Excessive scarring from the procedure
 - Allergic reaction to the medications or surgical instruments
 - Infection in the tissues after the procedure
 - Rare, unusual reactions, including possible death, following any surgical procedure
4. I understand that there are alternatives to this procedure, including full-thickness skin excision, laser destruction, freezing or cryotherapy, or chemical destruction of the growth. I understand that the alternate procedures may not yield the same benefits as the shave excision procedure. I understand that I can refuse this procedure.
5. I understand that unforeseen conditions may alter the planned procedure. I give permission to my doctor to alter the procedure (such as to remove the skin growth by performing a standard excision), if necessary, or to administer additional anesthetics or other medicines if I should need them for the completion of my procedure.
6. I have read this form and other information forms given to me by my doctor. I have had my questions answered to my satisfaction.

Witness: _____ Patient: _____

Date: _____

Minor: _____ Parent: _____

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Procedure Recording Form

Dermal Electrosurgical Shave Excision

Patient name: _____ Date: _____ Age: _____

Lesion 1

Location: _____

Symptoms: _____

Clinical impression: _____

Sent for histology?	Yes	No	Irritation from clothing or jewelry?	Yes	No
Bleeding?	Yes	No	Pain or tenderness?	Yes	No
Inflamed?	Yes	No			

Lesion 2

Location: _____

Symptoms: _____

Clinical impression: _____

Sent for histology?	Yes	No	Irritation from clothing or jewelry?	Yes	No
Bleeding?	Yes	No	Pain or tenderness?	Yes	No
Inflamed?	Yes	No			

Lesion 3

Location: _____

Symptoms: _____

Clinical impression: _____

Sent for histology?	Yes	No	Irritation from clothing or jewelry?	Yes	No
Bleeding?	Yes	No	Pain or tenderness?	Yes	No
Inflamed?	Yes	No			

Other lesions: _____

Procedure description:

The patient gave informed consent for the procedure. Other options were discussed, and the patient elected to undergo the electrosurgical shave excision. The lesion and surrounding skin were prepped with povidone-iodine solution and anesthetized with 2 percent lidocaine (with epinephrine) using a 30-gauge needle. The patient tolerated the anesthesia well. Sharp excision was carried out using a no. 15 blade held horizontal to the skin surface. Monsel's solution was applied with a cotton-tipped applicator to the wound base for hemostasis. Electrosurgical feathering was carried out using a cutting current and a setting of 1.5 to 3.0 (15 to 30 W). The wound edges were gently blended into the surrounding skin to improve the final scar result. Monsel's solution again was applied for hemostasis, and antibiotic ointment and a bandage were placed over the wound.

Complications: _____

Plan:

- ____ Patient will be notified of the histology results.
- ____ Patient was asked to be patient as the scar matures over time.
- ____ Patient will return if excessive scar or lesion recurrence are noted.
- ____ Patient was informed to return if the lesion appears infected.
- ____ Postprocedure instruction sheet was given to patient.

Physician: _____ CC: _____

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Nursing Instructions

Dermal Electrosurgical Shave Excision

Patient Preparation

The patient is seated or lying comfortably on an examination table. An absorbent sheet is placed beneath the site to be treated in the event any blood or fluid drains away from the treatment site (e.g., under the arm or over the collar around the neck). The electrosurgery return (antennae) plate is placed beneath the patient (it only needs to be near the patient to collect stray current).

Nonsterile Tray for the Procedure

Place the following items on a nonsterile drape covering a Mayo stand:

Nonsterile gloves

1 inch of nonsterile 4 × 4 gauze

A 5- or 10-mL syringe filled with 2 percent lidocaine (Xylocaine), with or without epinephrine, with a 30-gauge needle attached

4 × 4 gauze soaked with povidone-iodine solution

No. 15 scalpel blade

12 small cotton-tipped applicators

A small disposable plastic (medicine) cup containing Monsel's solution

A small disposable plastic (medicine) cup containing 85 percent aluminum chloride (if lesion is on the face)

Formalin container

Electrosurgical Cart

Electrosurgical generator

Smoke evacuator with a special small particle (viral) filtration system

Small dermal loop electrodes

Procedure Nursing Instructions

Hold the end of the vacuum tubing near the surgical site and activate the smoke evacuator during electrosurgery. For hemostasis, hand the cotton-tipped applicators with Monsel's solution (or aluminum chloride) to the physician (to prevent extensive reaching over the patient).

Postprocedure Nursing Instructions

1. Cleanse the wound with gauze that has been dampened with saline or water. Apply antibiotic ointment and a bandage to the surgical site.
2. Dispose of soiled gauze in a biohazard waste container. Dispose of the blade and needle in a sharps container.
3. The electrodes are cleansed of char, washed, and soaked in glutaraldehyde (Cidex) or autoclaved before the next use.

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