



Procedural review of toenail excision

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Matrixectomy

Toenail removal is a common procedure that family physicians routinely perform in the office. This article highlights the acute and chronic indications for toenail removal and its contraindications, potential complications, and procedural details including digital block anesthesia. A sample consent form and patient educational handout are provided as well as the current diagnostic *International Classification of Diseases, 9th revision*, and current procedural terminology codes for the clinician to use.

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Family physicians are often the primary health care contact for patients with toenail problems. Toenail complaints ranging from paronychia to onychomycosis affect every age group, and surgical excision of the nail may be an appropriate treatment option. Our purpose is to review the indications and procedural details for toenail removal, provide a concise patient consent form and educational handout for postprocedural care, and review the current *International Classification of Diseases, 9th revision (ICD-9)* and current procedural terminology (CPT) coding for such procedures. In addition, multiple authoritative references are provided to include an internet-based video demonstrating the basic components of this procedure.¹⁻⁶

Indications

Nail removal is an appropriate office-based procedure for many acute and chronic toenail conditions treated by family physicians.¹⁻⁶ Some of these acute conditions, such as nail trauma and ingrown toenails (onychocryptosis), may require partial or full nail plate removal. In addition, recurrent paronychia, onychomycosis, and onychogryphosis (nail deformities that cause pain) constitute chronic ailments that may necessitate toenail removal when response to conservative medical management has failed.⁷⁻¹⁰ After removal of the nail,

a partial or complete matrixectomy (permanent nail removal) may be necessary for these chronic conditions, and with onychocryptosis because of its high rate of recurrence.^{2,4,11} Finally, in cases of growths or discoloration beneath the nail, nail plate removal with biopsy may be needed to rule out malignant neoplasms, although biopsy techniques of the nail and nail bed are outside the scope of this review.^{2,3}

Contraindications/complications

Caution should be used in patients with peripheral vascular disease, diabetes mellitus, collagen vascular diseases, or other immune compromised states. Procedural complications include laceration of the nail bed, infection and parathesias postoperatively, and failure of matrixectomy leading to regrowth of the nail.¹⁻⁵

Materials

1. Absorbant drape/pad
2. Sterile and nonsterile gloves
3. 5-7 mL of local anesthetic (1% lidocaine without epinephrine) and a 23-25-gauge needle
4. Alcohol wipes
5. Betadine or chlorhexidine topical solution
6. Large and small cotton-tipped swabs
7. Rubber band or other tourniquet
8. Straight hemostat or periosteal elevator
9. Nail splitter (if performing partial nail removal)

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10. Scissors
11. Electrocautery or silver nitrite applicators
12. Phenol 85-88% and petroleum jelly (if performing matrixectomy)
13. Saline solution
14. 4 × 4-inch gauze
15. Antibiotic ointment
16. Surgical tape

Procedure¹⁻⁶

Consent

1. Obtain written consent for the procedure from the patient or legal guardian, using the consent form example provided in the Appendix.
2. Preparation of the above listed materials should be available in the procedure room and can provide for an appropriate “timeout” for the patient procedure.

Digital nerve block (three-sided)

1. Have the patient lie supine on the examination table with knees flexed. The affected foot should be placed flat on the examination table over an absorbent drape or pad.
2. Cleanse the distal portion of the metatarsophalangeal (MTP) joint with an alcohol wipe or sterilizing solution at the injection locations mentioned below.
3. Hold the needle perpendicular to the toe and place it distal to the MTP joint on the medial aspect of the digit (Fig. 1).
4. After aspirating for blood, slowly inject 1-2 mL of anesthetic while slowly advancing the needle toward the plantar surface until a wheal of the anesthetic medicine is seen on the plantar aspect of the digit.
5. Without removing the needle completely, redirect it across the dorsal aspect of the toe. Administer anesthetic



Figure 1 Medial anesthetic injection of the toe.



Figure 2 Redirection of the needle for anesthetic injection across the dorsum of the toe.

while directing the needle laterally. A total of 2 mL is sufficient (Fig. 2).

6. Remove the needle completely and replace where the wheal of anesthetic is present on the lateral aspect of the toe, distal to the MTP joint (Fig. 3).
7. Repeat step 4 above.
8. This digital nerve block can be adapted to perform a four-sided (ring) block by performing the procedure above with one additional step. After performing the three-sided block, remove the needle completely. Reposition the needle to the plantar surface of the toe medially and slightly distal to the MTP joint. Administer 1 mL of anesthetic while the needle is advanced laterally.

Nail avulsion

1. After sufficient anesthesia is achieved, a rubber band may be used to minimize bleeding by cinching it tight



Figure 3 Lateral injection placed at the previous wheal of anesthetic.

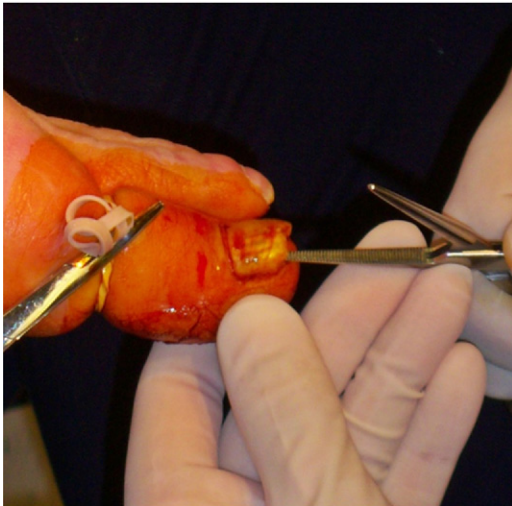


Figure 4 Use of hemostats to separate the nail from the nail bed.

around the base of the toe with a pair of hemostats. A tourniquet wrapped from the nail to the base of the MTP can be used as an alternative.

2. Wearing nonsterile gloves, prep the toe with sterilizing solution using large cotton-tipped applicators or 4 × 4-inch gauze. Start at the center and work outward, covering the entire digit. Repeat three times.
3. Apply sterile gloves and stabilize the affected toe with your nondominant hand.
4. Slide the tip of a hemostat or periosteal elevator under the distal edge of the nail plate. Advance proximally parallel to the nail while applying gentle pressure. Force should be applied proximally and superiorly to minimize damage to the nail bed (Fig. 4).
5. Continue to work proximally to loosen the nail plate from the nail bed until you reach approximately 0.5 cm past the cuticle. Repeat this procedure under the adjacent areas until you have freed the entire width of the nail plate.



Figure 5 Freeing the nail from the lateral folds (repeat on the other side of the toe).



Figure 6 After removal of the nail, debride any loose epithelial tissue and obtain hemostasis.

6. Grasping the lateral edge of the nail, use a twisting motion to free the nail plate from the lateral fold. Repeat on the other side.
7. Push back the cuticle to free the proximal nail fold along the entire width of the nail. A blade or scissors may be needed for this step.
8. Insert the hemostat or periosteal elevator under the entire surface of the nail plate to ensure that all soft tissue attachments are loosened prior to attempting to remove the nail (Fig. 5).
9. Grasp the distal nail plate lateral to the midline with the hemostat. Administer a steady pull with a twisting force medially. You will feel the nail plate free from under the cuticle. If needed, move to the medial side and repeat the motion laterally.
10. After the nail plate is removed, clean any loose epithelial tissue remaining on the nail bed with a pair of sharp

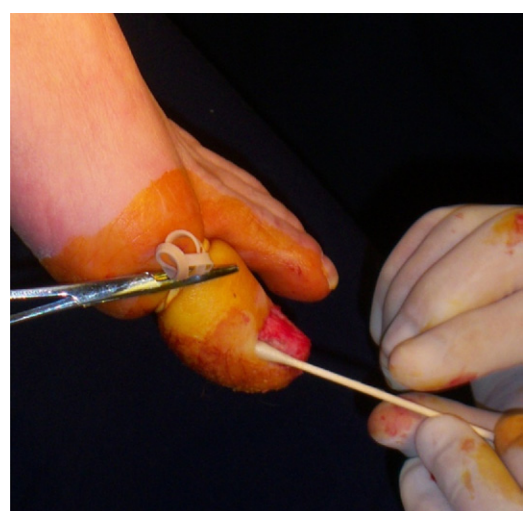


Figure 7 Phenol application to the lateral fold for chemical matrixectomy.

scissors. Stop any bleeding of the nail bed using electrocautery or silver nitrate applicators (Fig. 6).

11. This procedure may be adapted for partial avulsion by simply removing the affected portion of the nail plate. Separate the affected portion (typically one-third of the entire nail) from the nail bed and lateral fold as described above. Advance a nail splitter down the length of the nail to the cuticle, then cut. Remove the avulsed nail plate with hemostats, leaving the unaffected nail intact.

Matrixectomy

If the patient desires permanent nail ablation, a chemical matrixectomy should be performed after nail avulsion as follows:

1. Coat the lateral nail folds with petroleum jelly to prevent unwanted damage during phenol treatment. Also, ensure excellent hemostasis with electrocautery or silver nitrate applicators as above because of the inactivation of phenol by blood.
2. Apply phenol-soaked small cotton swabs to the nail bed at the cuticle and hold in place for 60 seconds. The matrix will turn gray-white. Repeat across the entire nail bed and under both lateral nail folds (Figs. 7 and 8).
3. Remove the rubber band or tourniquet.
4. Irrigate the area with isopropyl alcohol or saline solution to neutralize the phenol.

Post-procedural care

1. Apply antibiotic ointment to the entire nail bed. Cover with folded 4 × 4-inch gauze, wrap toe with roll gauze, and secure with surgical tape.
2. Provide the patient with a medication for pain relief for at least the first 48 hours post procedure (ibuprofen or acetaminophen are typically sufficient), as well as the patient handout provided in this article for home care.



Figure 8 Phenol application across the nail bed for chemical matrixectomy.

Table 1 Coding and billing

Current ICD-9 codes ¹²	CPT codes ¹³
Onychomycosis (110.1)	Nail removal, partial or complete (11730)
Onychogryphosis, onycholysis (703.8)	Permanent nail removal, partial or complete (matrixectomy) (11750)
Paronychia, toe (681.11)	Biopsy of nail unit (plate, bed, matrix, hyponychia, etc.) (11755)
Onychocryptosis (703.0)	
Toe neoplasm, primary malignant (195.5)	
Finger neoplasm, primary malignant (195.4)	
Toe or finger neoplasm, benign (229.8)	
Toe or finger neoplasm, uncertain behavior (238.8)	

Coding and billing

Current diagnostic ICD-9 and CPT codes are provided (see Table 1) to allow the physician to accurately document the patient's indication for toenail removal and bill for this service.

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Appendix

Patient handout: toenail removal

What do I do after the procedure?

- Wear an open-toed shoe home from the procedure and for the next several days.
- Have a family member or friend drive you home after the procedure.
- Try to elevate your foot and rest for the first 24 hours.
- Use a cloth-covered ice pack as needed for pain. Keep it in place for no longer than 20 minutes without a break.
- Take pain medication as instructed by your doctor for at least the first 24 hours.
- After the first 24 hours, wash the toe with soap and warm water 1-4 times daily for at least 5 days after the procedure.
- You may return to normal activities in 48 hours, but do not perform strenuous exercise for at least one week.
- Change your dressing daily until fully healed. Soak the toe in warm water to help remove the gauze. Apply a small amount of antibiotic ointment to the nail bed, and then cover with a clean gauze.

What are the possible complications?

- Pain and swelling
- Infection
- Bleeding
- Deformity of the nail if it grows back
- Numbness or tingling in the affected toe

When should I call my doctor?

- Persistent or increasing pain, redness or swelling of the toe after 24 hours
- Pus formation
- Persistent or excessive bleeding
- Fever or chills
- Unwanted regrowth of the nail

How do I avoid toenail problems in the future?

- Avoid trauma to the nail from pedicures or from poorly-fitting shoes
- Avoid prolonged exposure to irritants such as water and nail polish,
- Frequently change sweaty socks and shoes.
- Cut the nail flat across the entire length and don't share nail clippers (see Figure 9 below).



Figure 9 Correct nail cutting technique. Cut the nail so that the corners of the nail protrude beyond the nail folds (flat across the length of the nail).

Consent for medical procedure: toenail removal

Name of Patient: _____ Date of Birth: _____

I authorize and direct Doctor(s) _____ and/or such assistants as may be selected by him/her to perform the following procedure upon me: Partial/Total Toenail Removal with or without Matrixectomy.

The indicated procedure will be performed on my Left/Right _____ toe.

Description of operation in layman’s terms: Removal of deformed or ingrown nail with or without chemical treatment to prevent nail regrowth. An anesthetic medicine will be injected within the toe to provide pain control.

Dr. _____ has explained to me my condition, the procedure and its potential risks and complications. These complications include: Bleeding, infection, numbness or tingling to the affected toe, laceration to the nail bed, deformity of the regrown nail, and regrowth of the nail (if matrixectomy is performed).

No guarantee or assurance has been made as to the results that may be obtained and he/she has advised me of alternative therapies and has answered my questions.

I, the undersigned, have read and fully understand this consent form and it has been explained to me, to my satisfaction.

Patient Signature

Date and Time

Person Authorized to Sign for Patient

Relationship

Signature of Physician Obtaining Consent

Physician Name

Witness Signature

Witness Name