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Toenail Removal

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Nail Avulsion Basic Nail Anatomy and Surgery for the Internist

I. Nail Unit Anatomy

A. Nail Unit Terminology
   i. Nail Plate: Commonly referred to as toenail/fingernail
   ii. Proximal Nail Fold (PNF): Fold of skin on dorsal digit overlapping the proximal nail plate
   iii. Lateral Nail Folds (LNF): Folds of skin that overlap and support the lateral aspects of the nail plate
   iv. Lunula: the distal aspect of the nail matrix, visible as the white crescent beneath the proximal nail plate
   v. Nail bed: epithelium under the nail plate, extending from the matrix to the hyponychium
   vi. Hyponychium: epithelium under the distal aspect of the nail plate marking the end of the nail bed
   vii. Matrix: thick epithelium under the proximal nail fold responsible for production of the nail plate. The proximal matrix forms the top portion of the nail plate, the distal matrix forms the undersurface of the nail plate

B. Vascular Supply
   i. Lateral digital arteries divide into dorsal and ventral branches near distal interphalangeal space (DIP)
   ii. Ventral arteries extend distally, course around distal phalanx and form superficial and deep arcades
   iii. Vessels form arterial-venous (AV) anastomoses and AV shunts in the nail bed and matrix
C. Nerve Supply
   i. Paired palmar and plantar digital nerves parallel arteries to innervate nail bed, digital tip and pad

D. Nail plate
   i. Nail plate is a compact tri-laminar unit of keratin
   ii. Proximal matrix forms the dorsal nail plate
   iii. Distal matrix forms the ventral nail plate
   iv. Damage to the matrix causes nail dystrophy which could be permanent

E. Nail growth facts
   i. Fingernail growth: 0.1 mm/day, 3mm/month
   ii. Toenail growth: 0.03 mm/day, 1 mm/month
   iii. Nail growth is faster in
       1. men
       2. on middle digits
       3. on dominant hand
       4. in the summer
       5. during pregnancy
       6. after trauma, including nail biting
       7. psoriasis
   iv. Nail growth is slower during viral illness, lactation, and atopic dermatitis

II. Nail Disorders

A. Terminology
   i. Onychodystrophy: nail abnormality
   ii. Onychocryptosis: ingrown nail
   iii. Onychogryphosis: claw-like overgrowth of nail, usually caused by neglect
   iv. Onychorrhexis: longitudinal striations and ridging of nail plate
   v. Onychoschizia: layered splitting of free edge of nail plate
   vi. Onychauxis: hypertrophied thickened nail plate
   vii. Onychomadesis: shedding of nail plate from proximal end
   viii. Onycholyosis: separation of nail plate from nail bed

B. Causes of onychocryptosis
   i. Excess curvature of nail plate
   ii. Hypertrophic skin of lateral nail folds or tip of digit
   iii. Congenital or acquired abnormal nail or digit shape
   iv. Trauma – e.g. improper nail trimming, tight fitting shoes
   v. Hyperhidrosis//sweating, esp. in adolescents
   vi. Medications – Isotretinoin, acitretin

III. Management of Ingrown Nails
A. Temporary
   i. Cotton wisp under corner of nail plate
   ii. File or sand thickened nail plate
   iii. Chemical thinning of nail plate using 40% urea
   iv. Partial avulsion

B. Permanent
   i. Chemical matrixectomy
   ii. Surgical matrixectomy

IV. Nail Avulsion – Indications

A. Complete avulsion
   i. Onychogryphosis
   ii. Expose nail bed and matrix for nail unit biopsy to diagnose benign and malignant lesions or dermatoses
   iii. Complete matrixectomy
   iv. Treatment of subungual warts

B. Partial avulsion
   i. Temporary or permanent treatment of ingrown nails
   ii. Paronychia associated with onychocryptosis
   iii. Treatment of subungual warts
   iv. Expose part of nail unit for biopsy

V. Nail Procedures

A. Pre-operative considerations
   i. Obtain pertinent medical history – diabetes, peripheral vascular disease, artificial heart valve, allergies to anesthetics
   ii. Current medications – especially anticoagulants
   iii. Obtain informed consent – risk of permanent nail dystrophy, infection, bleeding, pain, reoccurrence
   iv. Counsel patient about post-operative course – time for regrowth, potential discomfort, activity limitations

B. Supplies
   i. Instruments – Freer septum elevator(nail plate elevator), nail splitter, hemostat, +/- curette.
   ii. Anesthesia – 1-2% plain lidocaine, 3 cc syringes, 30 gauge needle, 0.5% bupivacaine
   iii. Hemostasis – Penrose drain (tourniquet), cautery, aluminum chloride
   iv. Misc – cotton tipped applicators or urethral swabs for phenol matrixectomy, gloves
v. Dressings – petrolatum, non stick gauze, cotton tipped applicators, tape

C. Anesthesia tips
   i. Patient relaxation is critical for a successful procedure!
      1. Positioning – patient should be reclining in chair or flat, not sitting
      2. Relaxed atmosphere – music, calming demeanor of physician and
         nursing staff
      3. Reassurance
   ii. Administer anesthetic VERY SLOWLY using 30 gauge needle
   iii. Digital block – inject 1.0 - 1.5 cc at proximal aspect of digit. Inject
      midway between dorsal and ventral aspects. Goal is to bathe the digital
      nerves proximally with anesthetic. Less painful than distal injections
   iv. Allow adequate time for anesthetic effect, approx 10-15 minutes, this is
      critical
   v. Supplement with wing block if needed – inject anesthesia near junction
      of lateral and proximal nail fold. Supplement locally as needed
   vi. Assure that digit is completely numb prior to procedure.

VI. Complete Avulsion
   A. Administer anesthesia, and allow adequate time for effect. Verify that
      digit is numb, and if not, add supplemental anesthesia
   B. Prep digit – this is a clean but not sterile procedure. Betadine, chlorhexidine,
      or alcohol can be used.
   C. Insert freer septum elevator beneath nail plate, and gently push proximally
      separating the nail plate from the nail bed, until there is a sudden decrease in
      resistance. Aim the elevator upwards, against the undersurface of the nail
      plate, using care not to damage the nail bed or matrix.
   D. Remove the elevator, and reinsert again. Repeat until nail plate is
      completely separated from the nail bed.
   E. Use the elevator to separate the proximal and lateral nail folds from the nail
      plate.
   F. Using a hemostat or nail pulling forceps, grasp the nail plate, and roll
      laterally to free the most lateral and proximal aspects of nail plate, then pull,
      and remove the nail plate.
   G. Curette debris or granulation tissue if present.
   H. For hemostasis, apply direct compression for 10 minutes, cautery and/or
      aluminum chloride
   I. Consider injecting 0.5% bupivacaine to prolong anesthetic effect
   J. Apply pressure dressing with petrolatum, non adherent gauze, additional
      gauze for drainage and cushioning

VII. Partial Avulsion
A. Administer anesthesia
B. Prep digit
C. Insert freer septum elevator under lateral free edge of portion of nail plate to be removed.
D. Gently advance elevator to proximal aspect of unit.
E. Using nail splitter, with flat side along nail bed, and blunted tip on top, advance along nail plate to proximal aspect. Gently insert blunted edge underneath proximal nail fold.
F. With scissor like action, cut the nail plate
G. Use hemostat to remove lateral aspect of nail plate, in rolling motion, being sure to remove lateral and most proximal aspect of nail plate.
H. Curette any debris or granulation tissue.
I. Obtain hemostasis with pressure, cautery, and/or aluminum chloride.
J. Apply petrolatum, non-adherent dressing, and gauze.

VIII. Chemical matrixectomy (phenol)
A. Phenol (carbolic acid, 88%) can be used for a chemical matrixectomy, partial or complete.
B. Phenol must be kept fresh, in a dark jar, and requires a BLOODLESS field for effect.
C. After complete or partial nail avulsion, obtain hemostasis with pressure or tourniquet
D. Using a cotton tipped applicator or urethral swab, apply phenol to the lateral and proximal corners of the nail matrix (or complete matrix).
E. After 30-45 seconds, rinse with alcohol or sterile water.
F. Repeat steps D & E (total of 2 applications of phenol)
G. Consider applying petrolatum to the proximal and lateral nail folds, before applying phenol, to protect these structures from damage
H. Bandage as above.

IX. Wound Care
A. Some discomfort is to be expected within 1-2 hours.
B. Analgesic given at the time of surgery could be considered – acetaminophen
C. Elevation of the leg is very important to minimize pain – keep foot up on stool when sitting, consider a pillow under foot at bedtime.
D. The patient may apply cool compresses (ice pack)
E. Daily soaks could be considered if there is drainage or debris.
F. The wound should be washed daily with warm soapy water.
G. The wound should then be dried thoroughly, petrolatum applied, and covered with non-adherent dressing. Additional gauze can be helpful for drainage, and cushioning.
H. Consider giving the patient a prescription for pain medicine to have on hand.
Nail Surgery Codes

Avulsion of a nail plate (codes 11730 and 11732) is generally performed under local anesthesia and involves the separation and removal of a border of, or the entire nail from, the nail bed to the eponychium.

Excision of nail and nail matrix (code 11750) is performed under local anesthesia and requires removal of part or the entire nail along its length, with destruction or permanent removal of the matrix (e.g., chemical/surgical matrixectomy).

Wedge excision of skin of nail fold (code 11765) is designed to relieve pressure on the nail/soft tissue and requires an excision of a wedge of the soft tissue and ingrown nail from the involved side of the toe.

Debridement codes (11720, 11721) when actually performing routine foot care,

References

Title XVIII of the Social Security Act, Section 1862 (a)(7). This section excludes routine physical examinations.

Title XVIII of the Social Security Act, Section 1862 (a)(1)(A) states that no payment shall be made for items or services which are not medically reasonable and necessary.

CMS On-Line Manual Pub. 100-2, Chapter15, Section 290

www.cms.gov or www.medicare.gov

ICD-10 Codes

L60 Nail disorders

L60.0 Ingrowing nail
L60.1 Onycholysis
L60.2 Onychogryphosis
L60.3 Nail dystrophy
L60.4 Beau's lines
L60.5 Yellow nail syndrome
L60.8 Other nail disorders
L60.9 Nail disorder, unspecified