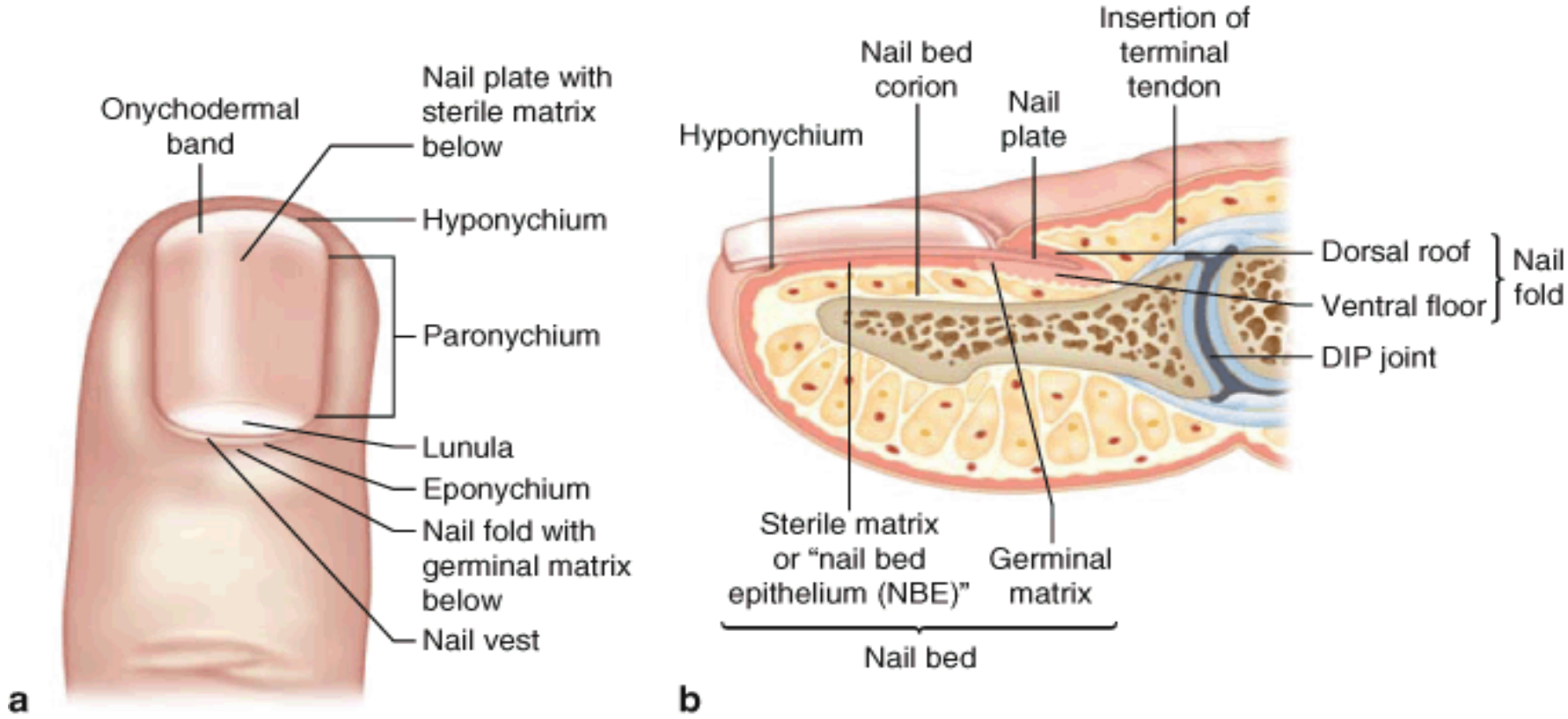
Objectives

- Describe and Review normal nail anatomy
- Describe and review common nail complaints that present to the outpatient office setting
- Describe common nail and nail bed procedures used to treat ingrown nails
- Describe considerations for follow up

Nail Anatomy



Common Nail Complaints

- Ingrown nails (onychocryptosis) is a common problem encountered in primary care practice
- Other common nail complaints include:
  - Brittle nail syndrome, onychomycosis, paronychia, nail psoriasis, longitudinal melanonychia, Beau's lines, onychomadesis and retronychia

Ingrown Nail common presentation

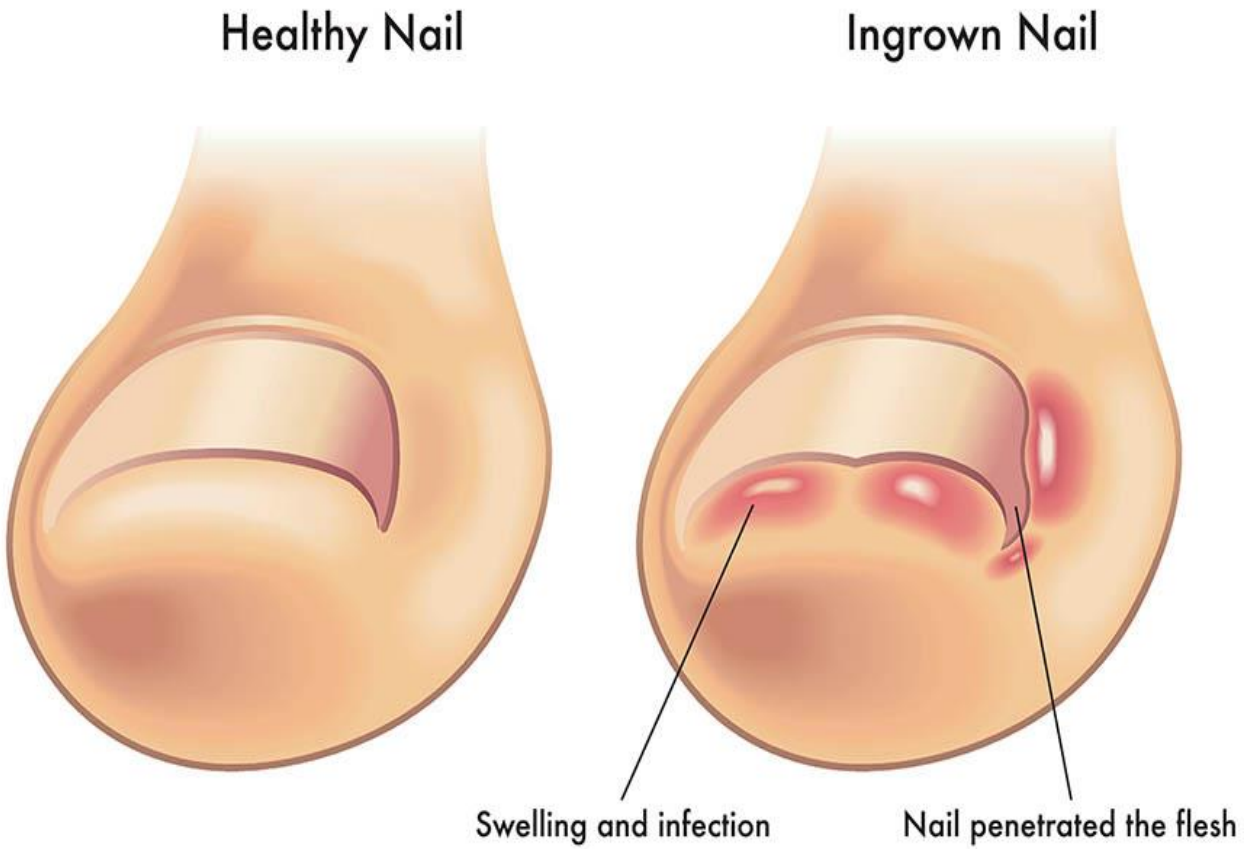
- Edema or inflammation of tissue surrounding the nail bed
- Erythema of the same tissue
- Macerated or friable granulation tissue
- Crusting
- Drainage
- Hypertrophy of the nail margin
- Hypertrophy of the surrounding epidermis
- Accordingly, ingrown nail has been divided into the following three stages [20] :

Ingrown nail stages

- Stage 1: Mild erythema edema and pain with pressure
- Stage 2: Significant erythema, edema, local infection, and discharge
- Stage 3: Granulation tissue formation and hypertrophy of the lateral wall besides the significant erythema, edema, and discharge

Ingrown nail

Ingrown nail



What is the physiology behind the infection?

- Ingrown nails are due to abnormal fit of the nail plate in the lateral groove, resulting in a foreign body reaction that produces edema, infection, and granulation tissue.

Risks factors for onychcryptosis

-Improperly trimmed nails or torn distal nails
-Hyperhidrosis
-Excessive external pressure from improperly fitting footwear or poor stance and gait
-Trauma to the nail unit
-Subungual neoplasms or skeletal abnormalities
-Diabetes mellitus
-Obesity
-Nail changes of the elderly, including onychogryphosis and onychomycosis

Nailbed resection approach

- Nail avulsion vs Wedge excision
  - Nail avulsion— Removing your whole toenail
  - Wedge excision — Removing part of your toenail where it is growing into the skin, along with the area of tissue in the corner that your toenail grows from

Nail Resection - Materials

- Syringe (3 mL or 5 mL) with long (1- or 1.5-inch) 25- or 27-gauge needle
- Local anesthetic without **epinephrine**
- Narrow periosteal elevator (nail elevator)
- Sterile scissors with straight blades (or nail splitter)
- Two straight hemostats
- Alcohol swabs
- Sterile gauze and tubular gauze dressing
- Topical antibiotic ointment
- Phenol solution (88%) and a radiofrequency electrosurgical unit with a Teflon-insulated matrix tip or a low-frequency unit with a needle tip (if performing a matrixectomy)

Nail Resection – Procedure

- Step 1
- Position the patient in the supine position, with the knees flexed and the foot flat on the table or the leg extended and the foot hanging off the end of the table. The clinician wears nonsterile gloves. Perform a digital block. After adequate time has elapsed (5 to 10 minutes), test the patient's ability to sense pain in the digit.

Nailbed Resection - Procedure

- Step 2
- Prep the toe. Free the lateral nail plate from the overlying proximal nail fold (i.e., cuticle). A Freer septum elevator or hemostat can be used to lift the cuticle off the nail plate. Create a tunnel between the nail plate and bed with the elevator or one jaw of a hemostat to allow passage of a nail splitter and removal of the lateral one fifth to one third of the nail.

Nailbed Resection - Procedure

- Step 3.
- If performing a partial nail avulsion, cut the nail with nail splitters or bandage scissors, placing the thin blade beneath the distal (free) edge of the nail. Cut the nail straight back beneath the proximal nail fold. As the proximal edge of nail is cut, a “give” is often felt by the operator.

Nailbed Resection - Procedure

- Step 4
- Grasp the lateral nail with straight hemostats and lift the nail out using a side-to-side rocking combined with a twisting motion that pulls outward and laterally. Part or all of the nail plate may be removed in this manner.

Nailbed Resection - Procedure

- Step 5
- After the nail has been removed, examine the lateral sulcus beneath the proximal nail fold to ensure no pieces of nail remain within the corner. Also examine the part of the nail removed. If part of the nail plate is missing, it must be found and removed or it will slow healing and cause pain.

Nailbed Resection - Procedure

- Step 6
- Matrixectomy can be performed chemically or electrosurgically. Make sure the lateral horn of the matrix is ablated by moving the electrode laterally beneath the proximal nail fold. Activate the electrode for 3 to 10 seconds, gently bouncing the electrode against the nail bed to produce ablation of the tissue. A short sizzling sound and a small puff of smoke may be seen. A properly treated nail bed appears white after thermal ablation.

Ingrown nail resection - Procedure

- Step 7
- If needed, the hypertrophied lateral tissue can be cut away or ablated with an electrode or scalpel.

Ingrown nail resection

- Postprocedure Instructions
- Place a thin film of antimicrobial ointment on the exposed nail bed and cover it with a nonadherent dressing. Wrap the digit with 1- or 2-inch rolled gauze. Disposable surgical slippers or open toe shoes can be worn by the patient on leaving the office.
- The foot should be rested and preferably elevated during the first 12 to 24 hours. Because matrixectomy ablates the nerve endings of the nail bed, pain should be minimal when it is used. Nonsteroidal anti-inflammatory drugs (NSAIDs) may be used for discomfort.
- The dressing should be changed in 24 hours, at which point normal ambulation may fully resume. The toe should be soaked and cleaned in warm water to help remove the bandage, and topical antibiotics may be recommended until healing is complete. The dressing change should be repeated daily. Tell the patient to expect a sterile exudate from the nail bed for several weeks. Emphasize proper nail hygiene to the patient.

Post-procedural Considerations

- Infections (treat with soaks and appropriate antibiotics).
- Regrowth of nail and return of symptoms. (The regrowth rate following phenol cauterization is 4% to 25%; for radiofrequency, <5%.)
- Permanent loss of nail plate (mainly with bilateral matrixectomy).
- Damage to underlying structures due to excessive application of electrosurgical matrixectomy.

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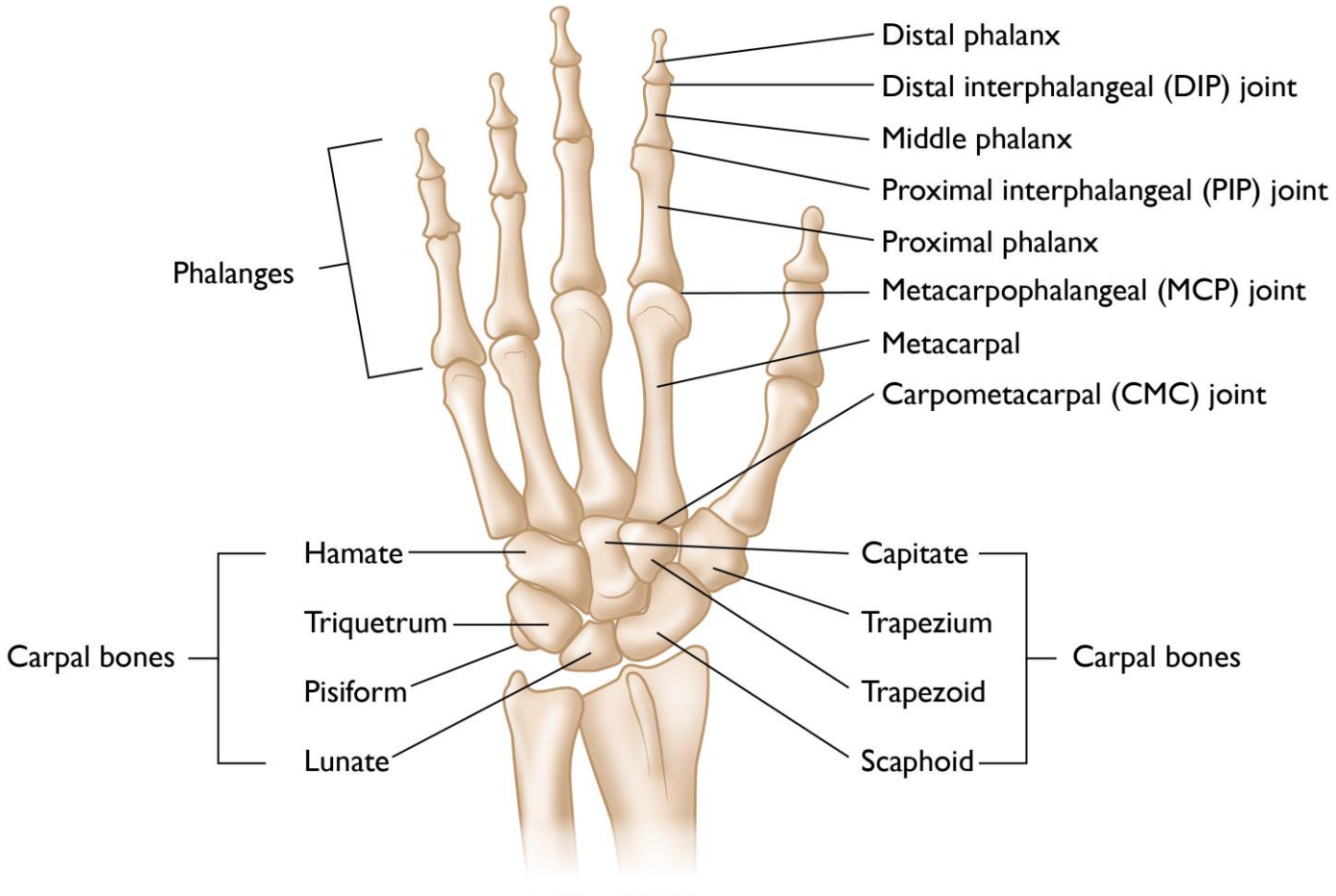
Objectives

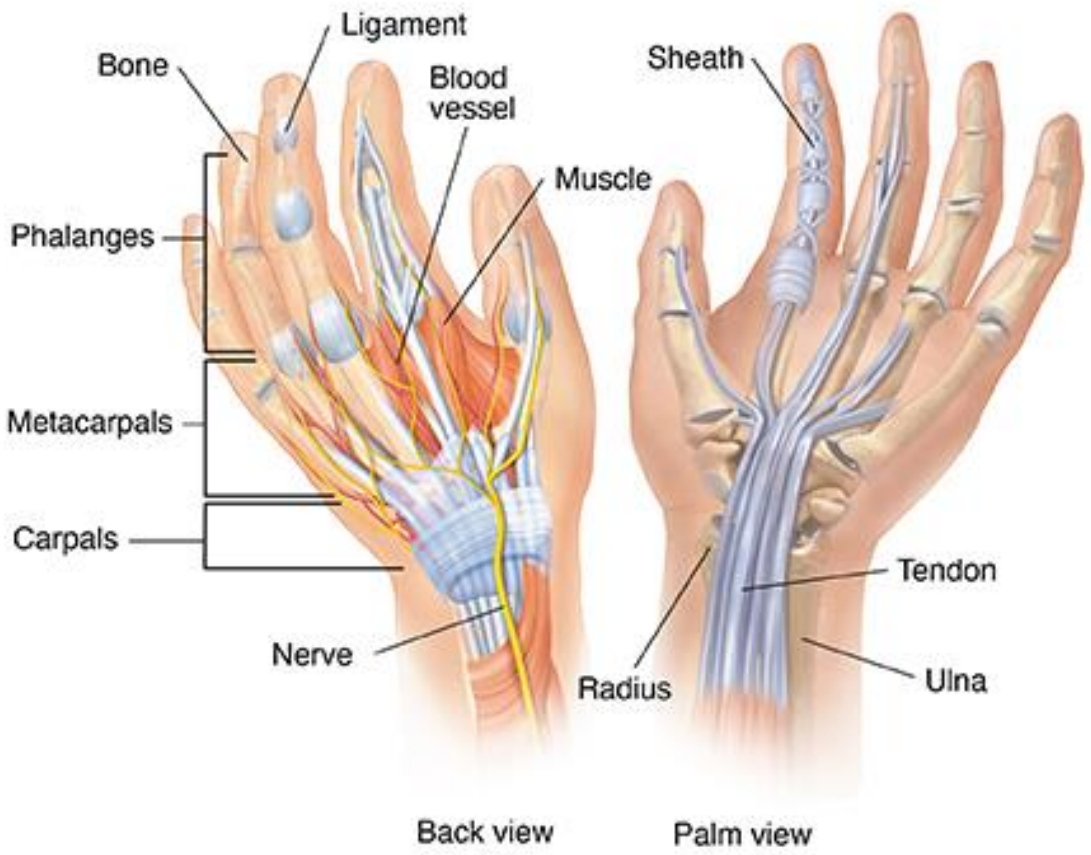
- Describe and review normal anatomy
- Describe and review common presentation of finger and toe dislocations
- Describe and review techniques for finger and toe reductions
- Discuss common follow up considerations

Finger and Toe Dislocations

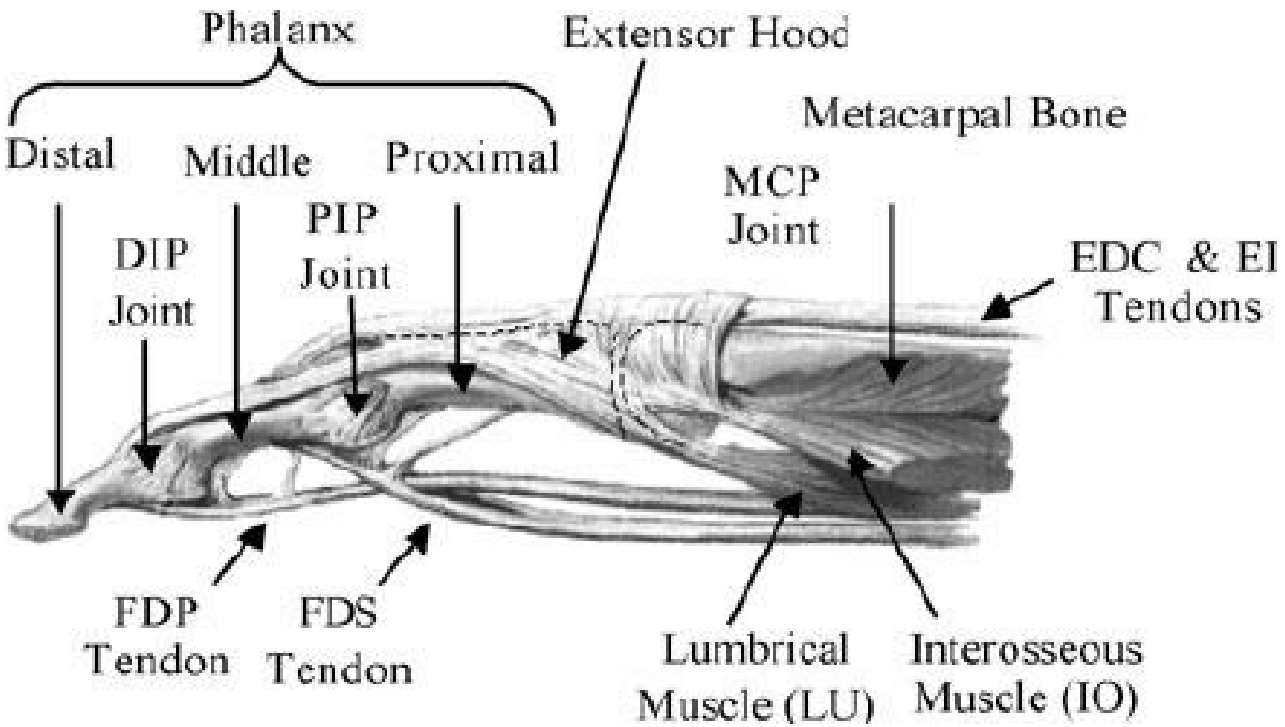
- Anatomy review



Hand/Finger Anatomy



Finger Anatomy



Finger and Toe Dislocations

The most commonly dislocated joint in the body is the proximal interphalangeal (PIP).

The severity of this injury often is underestimated and improper treatment can cause long-term morbidity. The direction of dislocation is usually dorsal, but lateral and volar dislocations sometimes occur.

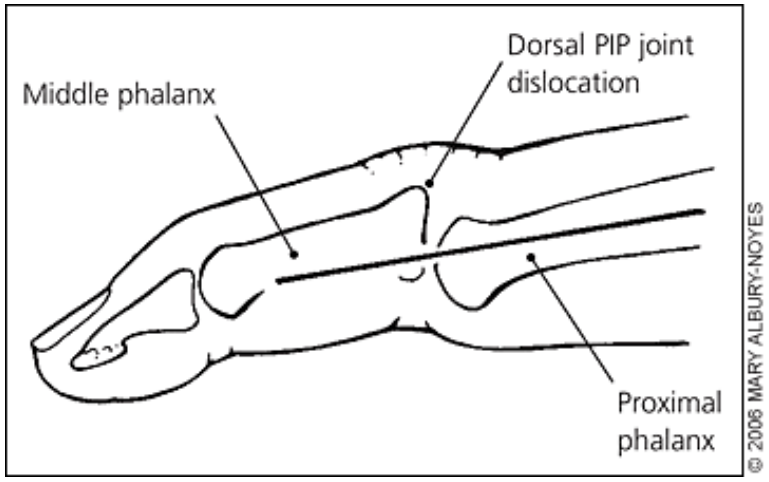
Finger and Toe dislocations reduction aims

- **Initial examination includes xr (oblique, anteroposterior, and true lateral views) and physical examination to detect fractures.**
- **Dislocation reduction is accomplished with careful traction.**
- **An orthopedic or hand surgeon should treat finger injuries that are unstable or that have rotation.**
- **Collateral ligament injuries of the thumb should be examined with radiography before physical examination.**
- **Stable joint injuries can be treated with splinting or casting, although an orthopedic or hand surgeon should treat unstable joints.**

DIP dislocations

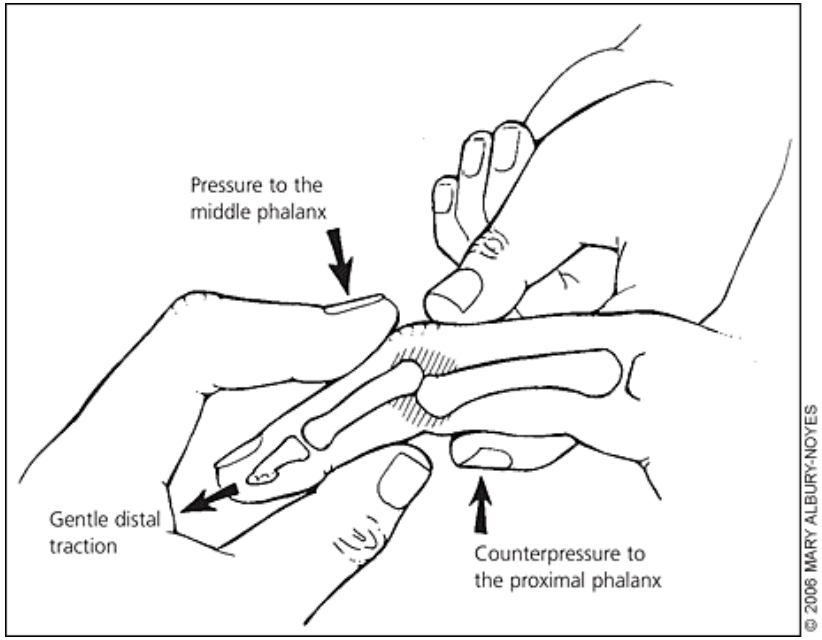
Dorsal PIP joint dislocation can injure the volar plate or cause an avulsion fracture of the middle phalanx.

A patient with a dorsally dislocated PIP joint will have tenderness at the volar plate and an obvious deformity.



Reduction Technique

- **Reduction of a dorsal PIP joint dislocation may be achieved by gently applying distal traction to the injured finger while applying volarly directed pressure to the middle phalanx**



Reduction Technique

- **Reduction is obvious when it occurs.**
- **If traction and volarly directed pressure is ineffective, the physician should hyperextend the distal portion to “unlock” the joint and continue applying traction and volarly directed pressure.**
- **If reduction is performed immediately, anesthesia is not needed. However, a digital block is usually needed for pain if presentation is delayed for more than one hour.**

Digital Block

- **For a digital block, 1 to 2% lidocaine (Xylocaine) without epinephrine is placed along both sides of the affected digit just distal to the MCP joint. A small-gauge needle (27 or 30 gauge) should be used.[6] If radiography shows a large fracture fragment, or if reduction is unsuccessful, referral to an orthopedic or hand surgeon is necessary.**

Post reduction evaluation

- **Radiographs should be obtained after reduction to evaluate joint congruity.-The collateral ligaments should be examined, and active flexion and extension should be evaluated to ensure the integrity of tendons. The PIP joint should be splinted in 30 degrees of flexion, and the clinician should follow up with radiography after one week to evaluate the healing progress.**

DIP JOINT Dislocayion

- Dislocation of the distal interphalangeal (DIP) joint usually is caused by a crushing injury, and associated trauma may complicate treatment. Uncomplicated DIP joint dislocations are reduced and treated the same as PIP joint dislocations. After one week, a stable joint should be splinted in flexion for two to four weeks followed by buddy taping and follow-up radiography.

MCP Joint Dislocations

- **The metacarpophalangeal (MCP) joint most commonly dislocated is that of the thumb. A simple dislocation involves no soft tissue obstruction, and reduction should be attempted. A complex dislocation involves intervening soft tissue (i.e., ligaments, musculature, or fascia) and requires surgical reduction. Reduction is the same as for PIP and DIP dislocations.**

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Discussion

- Any questions