Hallux Valgus Overview

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Hallux Valgus
Background

- Carl Hueter - Static subluxation of first MTP joint with lateral deviation of the great toe and medial deviation of the first metatarsal.
- Commonly called bunions—Bunio-L. turnip.
- Once the MTP joint is destabilized, muscle pull increases the deformity over time.
- Often painful prominence of medial eminence.
Common Causes

- Footwear - responsible for the vast majority of bunions
- Hypermobility of First MTC joint
- Neuromuscular disease
- RA
- Collagen deficiency
- Achilles contracture
- Second toe amputation
- Windlass mechanism disruption
Pathophysiology

- Once first MTP joint begins to sublux, the proximal phalanx moves laterally, exerting pressure against the MTH, pushing the MT medially and increasing the IM angle
- The abductor hallucis then slides underneath the MTH
- Intrinsic muscles no longer stabilize MTP joint
- Adductor hallucis becomes a deforming force, pronating the phalanx as it laterally deviates phalanx
- As the deformity continues, the EHL slides into first web space, further adducting the phalanx when contracted
- First metatarsal deviates medially away from sesamoid complex
Physical Exam

- Gait-normal push off
- Pronated forefoot
- Ankle and ST motion
- Calluses
- Lesser toe deformities
- Achilles contracture

- MTC hypermobility
- ROM of MTP and IPJ
- Correctability
- Pain with motion
- Neurovascular exam
- Pes planus
Weight Bearing Radiographs

- Hallux valgus angle
- Intermetatarsal angle
- Distal Metatarsal articular angle (DMAA)
- Joint Congruency
- Degenerative changes
- First MCP joint
- Length of first and second metatarsals
- Sesamoid position
Angles

- **HV angle** - between log axis of phalanx and MT; <15 deg.
- **IM angle** - intersection of long axis of 1st and 2nd metatarsals: <9 deg
- **DMAA** - between articular surface and long axis of 1st metatarsal
Severity of Deformity

- Mild: HV angle < 30°, IM angle < 13°, < 50% lateral subluxation of fibular sesamoid (FS)
- Moderate: HV angle < 40°, IM angle > 13°, 75-100% lateral subluxation of FS
- Severe: HV angle > 40°, IM angle > 20°, 100% lateral subluxation of FS
General Algorithm

- DJD → MTP Fusion
- Mild → Chevron, DSTP, Mitchell
- Moderate → DSTP + prox. osteotomy, Mitchell
- Severe → DSTP + prox. osteotomy, MTP fusion
Conservative Treatment

- Soft leather shoes with wide toe box
- Modification of existing shoes
- Bunion pads
- Night splints
- Orthotics not proven to prevent progression of deformity
Decision Making

- Chief complaint, occupation, activity level
- History and PE findings
- Radiographic findings
- Age
- Neurovascular status
- Patient expectations
Operative Options

- Soft tissue reconstruction
- Proximal or distal MT osteotomy
- Arthrodesis of first MTP joint
- Excisional arthroplasty
- Combination of procedures
- No single procedure works for all deformities
Distal Soft Tissue Procedure (McBride)

- Release of contracted lateral structures—adductor hallucis, transverse metatarsal ligament, lateral capsule
- Exostectomy of medial eminence
- Indications: HV < 30°, IM < 13°
- Contraindications: mod. to severe deformity, arthrosis, spasticity, DMAA > 12-15°
- If more than 20° correction needed, should combine with MT osteotomy
Proximal Osteotomy
Chevron Osteotomy

- **Indications:** mild deformity, age < 60
- **Contraindications:** large deformity, age > 60
- **Procedure**
  - expose medial MTP joint, excise medial eminence in plane of foot
  - Apex of osteotomy centered in MTH
  - MTH displaced laterally < 1/3 rd MT width
  - +/- pin fixation- K-wire, PLA pin
- **80% good to excellent results**
- **Complications:** pain, recurrence, transfer metatarsalgia, neuritis, arthrofibrosis,
Chevron Osteotomy
Mitchell Osteotomy

- Double step cut osteotomy through neck of 1st MT, displacing head laterally and plantarward
- Indications: mod. to severe deformity, age < 50
- Contraindications: mild deformity, short 1st MT, congruent joint, arthrosis
- Complications: shortening 1st MT, transfer metatarsalgia, loss of osteotomy position, instability, arthrofibrosis, AVN, delayed union, malunion, non-union
Mitchell Osteotomy
Mitchell Osteotomy
Akin Procedure

- Excision of medial eminence and closing wedge osteotomy of proximal phalanx
- Fixation with heavy suture or oblique pin
- Good salvage procedure for residual HV
- Indications: HV interphalangeus, increased DMAA
- Contraindications: subluxed 1st MTP joint
- Complications: recurrence, non-union/malunion, AVN, transection of FHL
Akin Procedure

Fig. 12-A

Fig. 12-B

Fig. 12-C

Fig. 12-D
Keller Procedure

- Resection of 1/3 of proximal phalanx
- Pin fixation or suturing plantar aponeurosis to FHL to prevent cock-up deformity
- Indications: elderly, household ambulator, poor circulation, salvage procedure
- Contraindications: young, active, high demand of great toe
- Complications: transfer metatarsalgia, cock-up deformity, recurrence
MTC Arthrodesis (Lapidus)

• Indications: hypermobility of 1st MTC joint -> 25-35° of motion, IM angle > 15°
• Relative Contraindications: young patient, open epiphysis
• Failure rate up to 20%
MTC Arthrodesis
MTP Arthrodesis

- 6 hole ¼ tubular plate or 4.0 cannulated screw
- 15° valgus, 10-15° dorsiflexion
- Indications: severe HV deformity > 50°, RA, hallux rigidus, arthrosis, CVA, head injury, CP, salvage procedure
- Relative contraindications: Insensate foot, arthrosis of 1st MTC joint
Arthrodesis
Scarf or Z - Osteotomy

- Scarf - technique used by carpenters to lengthen beams
- Also used in correction of HV deformity
- Can lengthen or shorten MT, as well as control rotation and dorsiflex or plantarflex MT
- Technically challenging
- Strong fixation = early function
Goals of Surgery

- Correction of HV and IM angles
- Correction of incongruous joint
- Removal of medial eminence
- Retention of functional ROM
- Maintenance of normal weight bearing mechanics
Complications

- Infection
- Delayed wound healing
- Skin slough
- Scarring
- Paresthesias
- Shortening of MT
- Recurrence
- Overcorrection
- Malunion/non-union
- AVN
- Cock-up deformity
- Transfer metatarsalgia
- Hallux varus
- Loss of fixation