The Failed Hallux Valgus
Failed for who?

- Surgeon point of view
  - Congruent joint
  - Normal Joint space
  - Solid union
  - No infection
Patient point of view:

- No bump
- Straight toe
- Cosmetic scar
- Good motion...enough to wear high hell
- No pain
- Almost: restituo ad integrum...
Why did the original procedure failed?

- Stretching the indications (too big deformity for the procedure)
- Wrong procedure for the problem
- Bad technique of an adequate procedure
- An expected complication for that procedure
- A complication non specific to the procedure
- A misunderstanding of the expected results – Patient versus Surgeon expectation....
The Failed Hallux Valgus

- Complications after distal metatarsal osteotomy
- Complications after proximal osteotomy
- Complications after Lapidus procedure
The Failed Hallux Valgus

- Complications after distal metatarsal osteotomy
- Complications after proximal osteotomy
- Complications after Lapidus procedure
Post-Chevron
Complications after distal metatarsal osteotomy 1. Chevron

- Recurrent deformity
- Stiffness
- Avascular necrosis
- Malunion
Complications after distal metatarsal osteotomy

1. Chevron

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Complications after distal metatarsal osteotomy

1. Chevron

* RECURRENT DEFORMITY

- 1. Plane of osteotomy
- 2. DMAA
- 3. Too big deformity for the procedure
- 4. Loose capsulorraphy
- 5. ...Lateral soft tissue release
1. Plane of the osteotomy

- **Avoid:**
  - Doing the osteotomy in line at right angle with the first metatarsal;
  - It is more unstable and tend to go back to its previous position
  - Tend to ↑ the bone length (Stiffness)

- **Instead:** the osteotomy should be done at right angle to the foot
  
  *But: Avoid shortening*
Errors in Chevron Osteotomy

- Here the osteotomy was done to the axis of the bone, instead of the foot:
  - Result: 4 weeks post-op: distal fragment back to its original position
- So if needed to lengthen the bone: \textit{a good fixation needed}
- Remove the Medial Eminence parallel to the foot, not the metatarsal.
Chevron- Recurrent deformity

2. The DMAA angle

- Primo:
  - RECOGNIZE

- Danger:
  - Make a straight toe with an **incongruent joint** out of a valgus toe but congruent joint
  - With time will displace
Recurrent deformity

3. Too big deformity for the technique

- HV angle $< 30^\circ$
- IM angle $< 14^\circ$
Chevron- Recurrent deformity

4. Too loose capsulorraphy

- Tension should be just enough to prevent lateral displacement
  - With Akin: no over correction
  - Without Akin: minimal overcorrection

But Too tight capsulorraphy might lead to stiffness.
Capsulorraphy

P-1

Capsule

1st Metatarsal
Chevron- Recurrent deformity

5. ... Lateral soft tissue release

- Multiple studies:
  - STR with distal osteotomy: Safe

- Incidence of AVN is so low, \( \leq 1 \% \) (periosteal stripping is more a concern),

- Most expert: Caution... if a STR is needed

  The indication is probably stretch...

* Proximal osteotomy ...
* Adding a Akin procedure are safer.
Complications after distal metatarsal osteotomy

1. Chevron

- Recurrent deformity
- **Stiffness**
- Avascular necrosis
- Malunion
Complications after distal metatarsal osteotomy 1. Chevron: Stiffness

- If after correction the join is *incongruent*...
- Failure to recognize the elevated DMAA > 10°
- Do a biplane Chevron

- Avoid Dorsal incisions
- Careful not to damage sesamoid apparatus
Complications after distal metatarsal osteotomy

1. Chevron

- Recurrent deformity
- Stiffness
- Avascular necrosis
- Malunion
Distal soft tissue release and Distal metatarsal osteotomy

- Avascular necrosis
  - Less than 1% after STR
  - In fact, it is the excessive periosteal stripping, but...
- Difficult salvage:
  - Resection arthroplasty
  - MTP Fusion
Post-Mitchell
(Modified) Mitchell
Complications Post-Mitchell

1. Transfer Metatarsalgia
   - (Shortening of 1\textsuperscript{st})

2. Mal-Union
   - Dorsi-Flexion
   - Plantar-Flexion
   - Medial or Lateral tilt

3. Delay, Non-Union
If there is no malunion but only metatarsalgia from a short first metatarsal:

- **Lengthening of 1rst Metatarsal**
  - Rarely indicated (risk ↑↑ of stiffness and osteoarthritis)

- **Shortening Lesser Metatarsal**
  - Important to restore the normal cascade pattern
  - Usually M2, but always check M3 for shortening osteotomy
    - **Weil osteotomy**
Classical case post-Mitchell

- 1\textsuperscript{st} Metatarsal shortening
- Dorsi-Flexion mal-union
Better do both at initial surgery!
Myerson modification

Classical Weil

My Modification
Since 2001
Post-Mitchell  2. Mal Union: in Dorsi-Flexion
Post-Mitchell

- So to avoid displacement:
  - A fixation is needed (not the cerclage wire)
Modified Mitchell

Selective Indications and Principles

- Metatarsal length **absolute** importance
  - Need a long 1\(^{\text{st}}\) Metatarsal or
  - Need to shorten at the same time the 2\(^{\text{nd}}\) (and 3\(^{\text{rd}}\) PRN
  If the 1\(^{\text{st}}\) is not longer than the 2\(^{\text{nd}}\) or 3\(^{\text{rd}}\)

- HV angle <40° (30-40)
- IM angle <14°
- Need a Internal fixation

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**Ideal Indication:**

- **H Valgus with some degenerative changes**
  - That some decompression is needed
  - Might be osteoporotic (which is a contra-indication for screw fixation like in Ludloff, Scarf, Mann osteotomies)
Post-McBride
Post-Mc Bride: Hallux Varus
Hallux Varus – Treatment

*Extensor Hallucis Brevis (EHB) Procedure (Myerson)

- K. Johnson Classical:
  - EHL transfer:
    - IP Fusion &
    - Total EHL cut distal

- Modification:
  - Half of EHL
  - No need to fuse IP joint
Hallux Varus – Treatment

*Extensor Hallucis Brevis (EHB) My Procedure (Base Proximally)
If the joint cannot be salvage (osteoarthritis) After Distal Osteotomy

- **First MTP fusion**
- **Modified Keller resection arthroplasty**
  - (Hamilton modification)
- **Valenti arthroplasty**
1st MTP Arthrodesis

- **Dorsi-Flexion:** 10-15° to the floor
  20° to the 1st Meta

- **Valgus:** 10° - 15°

- **Fusion rate:** 88% after failed H. Valgus surgery
  94% – 100% at initial surgery
  
  - 94% 2 Steinmann pins
  - 96% 2 (3.5mm) cross screws
  - 97% Multiple threaded K-wirws
  - 100% conical reamming and plate

  Less with Interpositionnal Bone Graf after Failed Keller

- **Late IP Degeneration:** 15% (3 time more in Women)
  
  increase with HV angle >20°
Complications Post-1\textsuperscript{st} MTP Fusion
If the joint cannot be salvage (arthrosis)
After Distal Osteotomy (Chevron-Mitchell)

- First MTP fusion
- Modified Keller resection arthroplasty (Hamilton modification)
- Valenti arthroplasty
Cut EHB proximally

Excise ¼ Proximal P-1

Free up Dorsal capsule
With EHB slide it down
To FHB

Bill Hamilton Capsular
interposition (modification
of Keller resection arthroplasty

1/3 resection for Regular Keller
If the joint cannot be salvage (arthrosis) After Distal Osteotomy (Chevron-Mitchell)

- First MTP fusion
- Modified Keller resection arthroplasty
  - (Hamilton modification)
- Valenti arthroplasty
Valenti 1<sup>st</sup> MTP Arthroplasty: Extensive Cheilectomy

- NB. The lower part of the joint and sesamoid apparatus are left intact
The Failed Hallux Valgus

- Complications after distal metatarsal osteotomy
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Crescentic Proximal Osteotomy

1 Year Post-op:
Complication after Proximal osteotomy

- Mal-Union
  - Dorsi-Flexion
  - Plantar-Flexion
- Non-Union
- Excessive Shortening
- Under-correction
- Over-correction
Complications after Proximal Osteotomy - Treatment

- **Mal-Union**
  - Dorsi-Flexion: Sometimes difficult to correct
    - TX: Some type of plantar osteotomy
    - If excessive shortening: BONE GRAFTING

- **Plantar-Flexion:**
  - *Dorsi-Flexion osteotomy*
    
    To avoid shortening: a crescentic osteotomy can be done in the sagittal plane

- **Non-Union:** rarely. If occurs: Bone grafting
Hallux Varus after proximal osteotomy
MTP Lateral Soft tissue

- Conjoint tendon = PIB
- MTP Lateral collateral Lig.: NO
- Metatarso-sesamoid suspensor Lig.
- Fibular Sesamoid: NO
- Adductor Hallucis

PIB = Phalangial Insertion Band
Ludloff Osteotomy
Modified Ludloff...Complications
Modified Ludloff...Complications

- Plantar-flexion
- Lost of Fixation
SCARF OSTEOTOMY
Scarf Osteotomy

Barouk, L.S., SCARF OSTEOTOMY FOR HALLUX VALGUS CORRECTION
Foot and Ankle Clinics, Volume 3, September 2000, 525-580

* Results: (123 feet, 76 patients) FU 3 to 46 months (13)

- HVA: 35.2° → 16.4°
- IMA: 17.4° → 10.2°
- ROM: 75 ° (DF: 65° PF: 10°)

Complications:
- 2 Stress fractures (at proximal osteotomy site)
- 4 Recurrences (HVA >25°) 2 need capsuloplasty
- 5 Over-correction → Hallux Varus (Learning curve: 8% → 3%)
- 3% Prominent Hardware, less with Threaded head screws.
- 3 Osteonecrosis (2 need arthrodesis)
- Rare: Under-correction or Stiffness (early mobilization)
The Failed Hallux Valgus

- Complications after distal metatarsal osteotomy
- Complications after proximal osteotomy
- *Complications after Lapidus procedure*
Complications after Lapidus Procedure

- 1. Non-union
- 2. Mal-Union: Dorsi-Flexion (mostly)
- 3. Excessive Shortening
Complications Lapidus Procedure

1. Non-UNION (10-12%....7% to 50%!!)
   - Significantly more common than Mal-Union
   - Very high rates
   - Frequently symptomatic
   - Need: Multiple screw fixation and Cast Immobilisation and A period of non-weight bearing (4-6 weeks)
     
     (Union rate better with Bone Grafting)
Modified Lapidus procedure

- Popularize by Sig. Hansen
- Minimal articular resection
- C1→ M1
- M1→ M2
- Big Screws (4.0-4.5)
- Lag Screw tech.
- Local Bone Graft
The number 1 complication of Hallux Valgus surgery is not on the first ray!
Transfer Metatarsalgia is the No. 1 problem after bunion surgery. Usually the 2nd Metatarsal.
Review of All Orthopaedic surgeries which led to litigation: (USA - Glyn Thomas)

- Most: **Foot surgery : 23 %**

- Out of this: **64% : Lesser metatarsal problems**
Expectations: Surgeon versus Patient

- Good discussion
- Need to repeat
- Patients tend to underestimate minor warnings
  - So... be clear and emphasis on what is a realistic result.
- Do the proper technic
- Take in account Lesser Metatarsals