The Failed Hallux Valgus

Failed for who?

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

Failed for who?

- **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

- **Recurrent deformity**
- Stiffness
- Avascular necrosis
- Malunion

Complications after distal metatarsal osteotomy

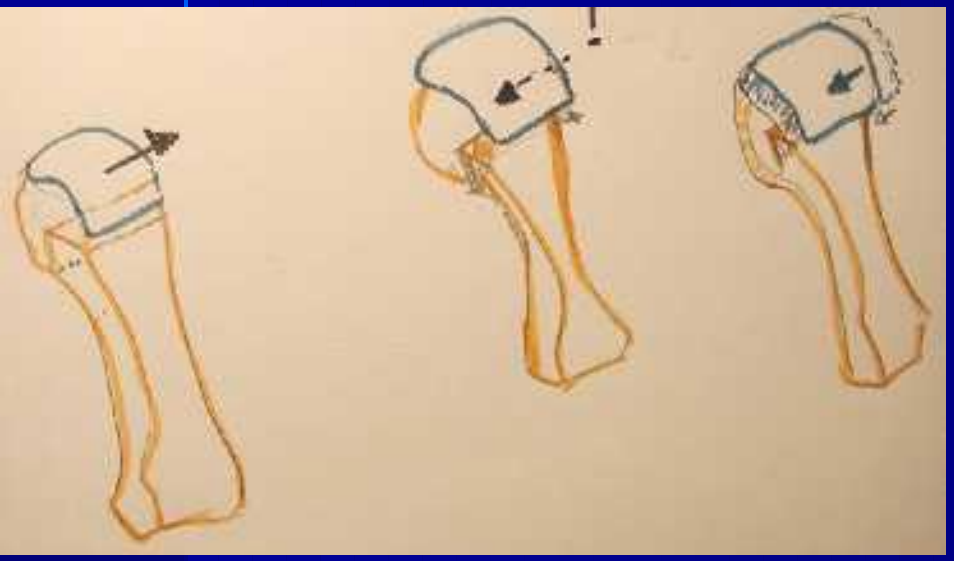
1. Chevron

* RECURRENT DEFORMITY

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

Chevron- Recurrent deformity

1. Plane of the osteotomy



- Avoid:
  - Doing the osteotomy in line at right angle with the first metatarsal;
  - It is more unstable et tend to go back to it's 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 done in the axis of the bone, instead of the foot:
  - Result: 4 weeks post-op: distal fragment back to it's original position
- So if needed to lenghten the bone: 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

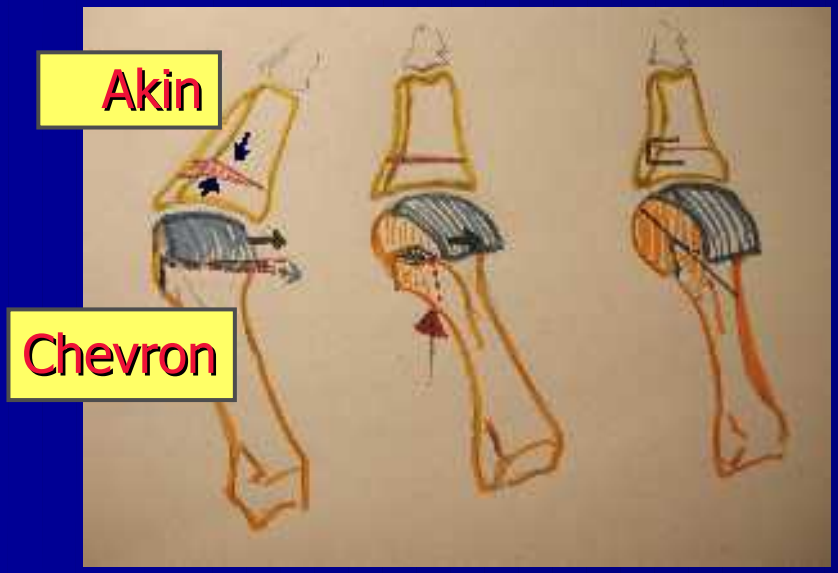
Chevron- Recurrent deformity
3. Too big deformity for the technique

- HV angle < 30 °
- IM angle < 14 °

Chevron- Recurrent deformity

4. Too loose capsulorraphy

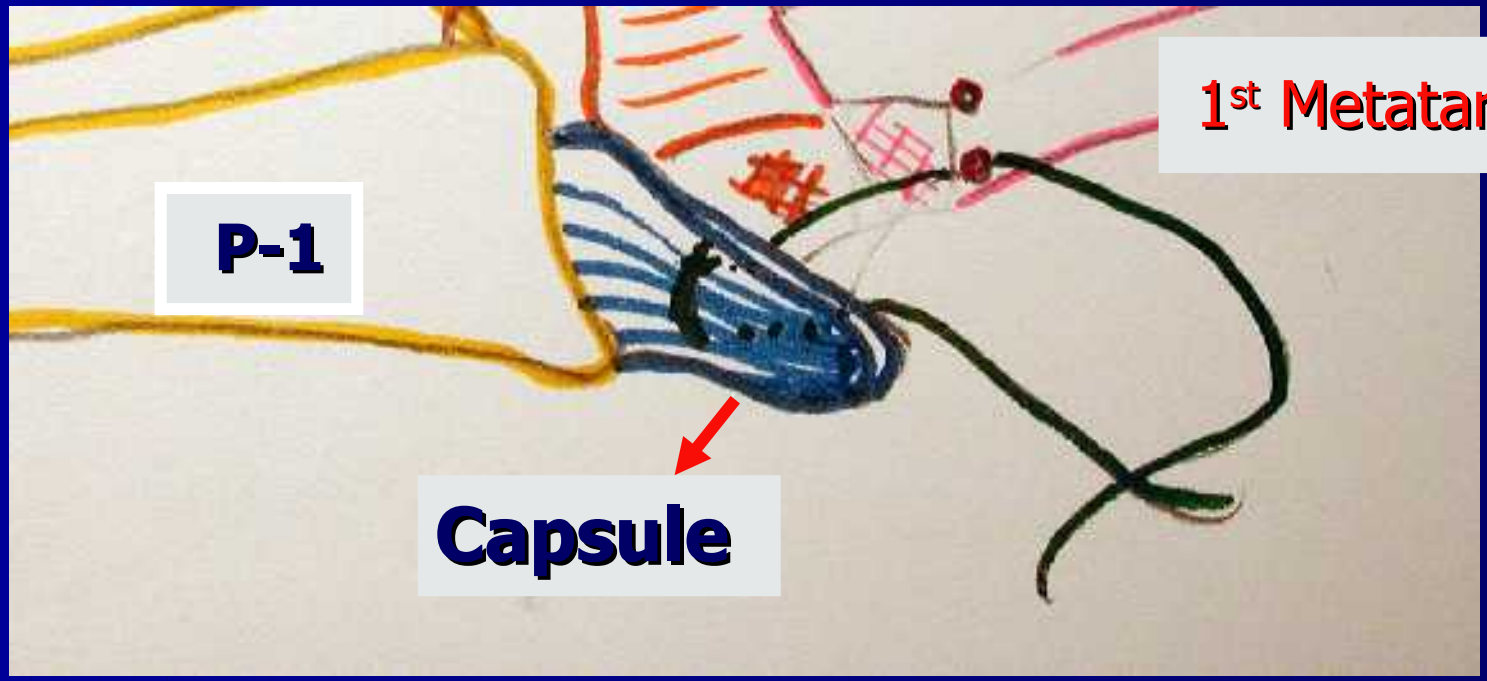
- Tension should be just enough to prevent lateral displacement



  - With Akin : no over correction
  - Without Akin : minimal overcorrection

But Too tight capsulorraphy might lead to stiffness.

Capsulorraphy



Chevron- Recurrent deformity
5. … Lateral soft tissue release

- Multiple studies:

  STR with distal osteotomy : Safe

- Incidence of AVN is so low, ≤ 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

Biplane Chevron

- If after correction the join is ***incongruent***…
- Faillure to recognise the elevated DMAA > 10 °
- Do a biplane Chevron

- **Avoid Dorsal incisions**
- **Careful not to damage** sesamoid apparatus

Complications after distal metatarsal osteotomy 1. Chevron

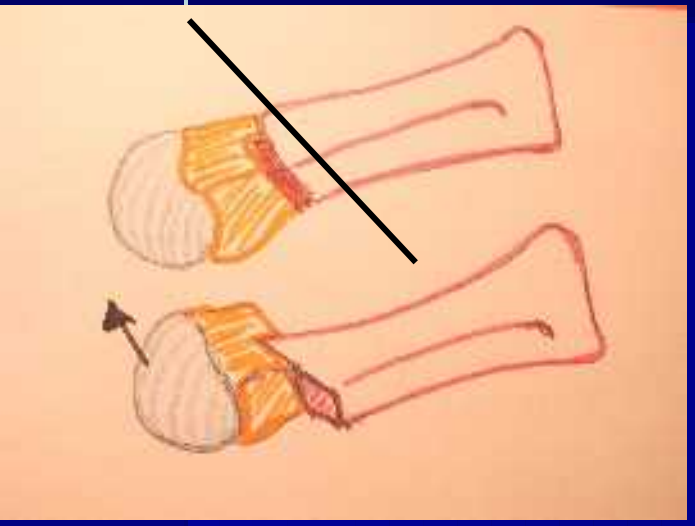
- Recurrent deformity
- Stiffness
- **Avascular necrosis**
- Malunion

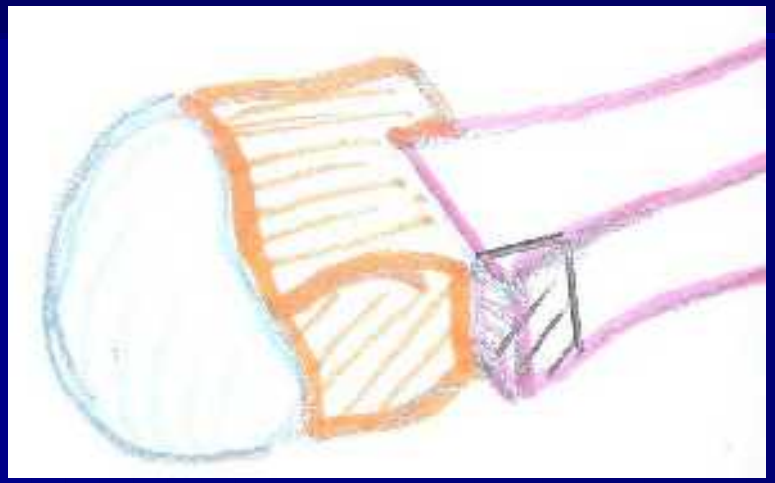
Distal soft tissue release and Distal metatarsal osteotomy

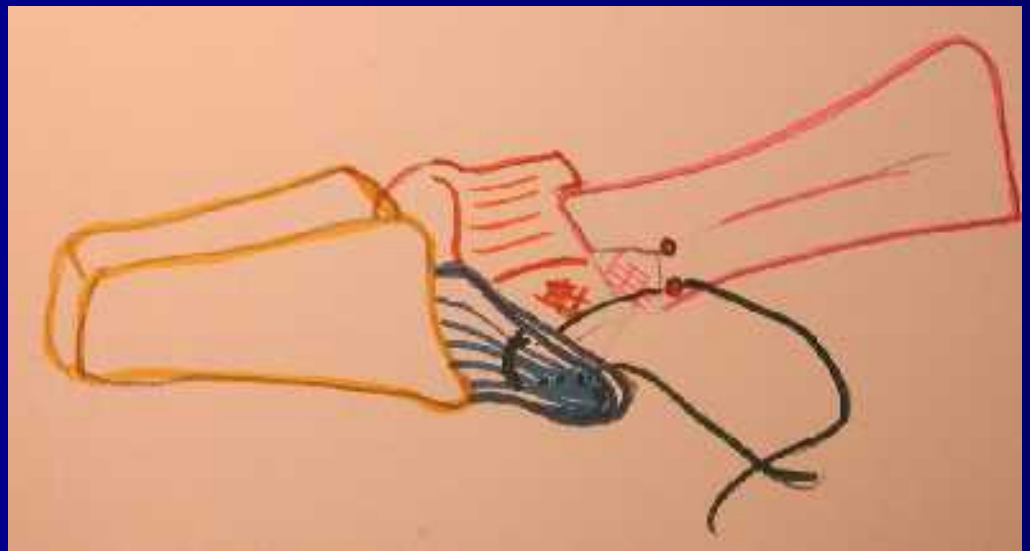
- **Avascular necrosis**
  - Less than 1% after STR
  - In fact, it is the excessive periosteal stripping, but…
  - Difficult salvage:
    - Resection arthroplasty
    - MTP Fusion

Post-Mitchell

(Modified) Mitchell







Complications Post-Mitchell

- 1. Transfer Metatarsalgia
  - (Shortening of 1st)
- 2. Mal-Union
  - Dorsi-Flexion
  - Plantar-Flexion
  - Medial or Lateral tilt
- 3. Delay, Non-Union

Post-Mitchell -1 TRANSFER METATARSALGIA

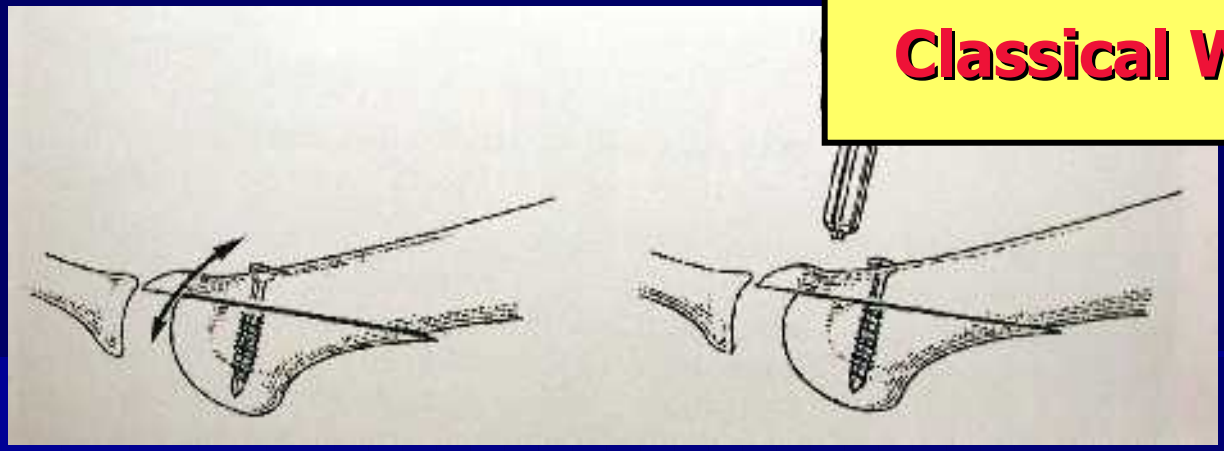
- If there is no malunion but only metatarsalgia from a short first metatarsal:
  - Lengthening of 1rst Metatarsal
    - Rarely indicated (risk ↑↑ of stiffness and osteoarthrisis)
  - **Shortening Lesser Metatarsal**
    - Important to restore the normal cascade pattern
    - Usually M2, but always check M3 for shortening osteotomy
      - **Weil osteotomy**

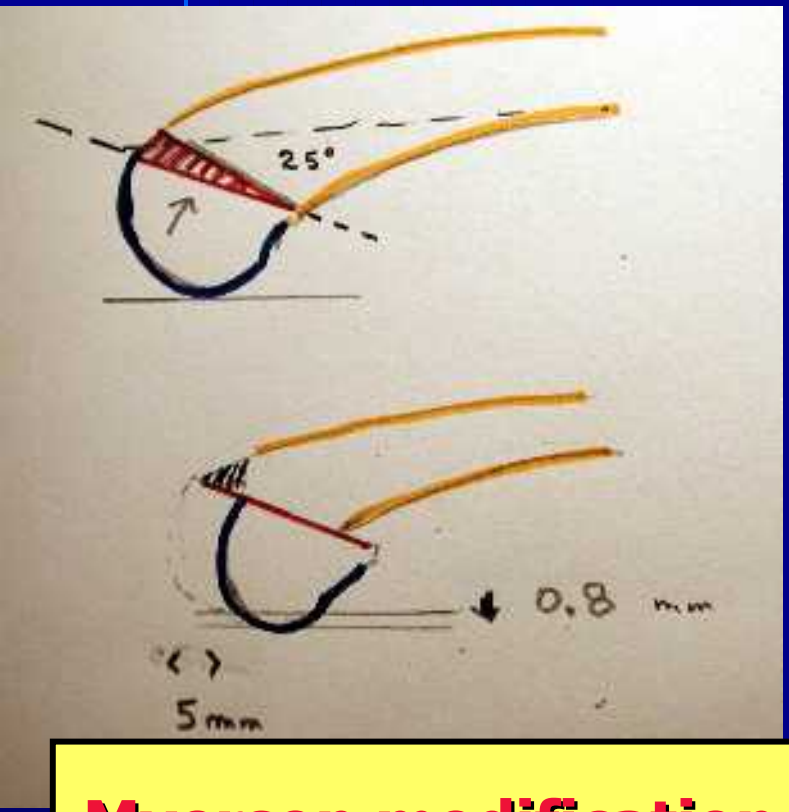
Classical case post-Mitchell

- 1st Metatarsal shortening
- Dorsi-Flexion mal-union

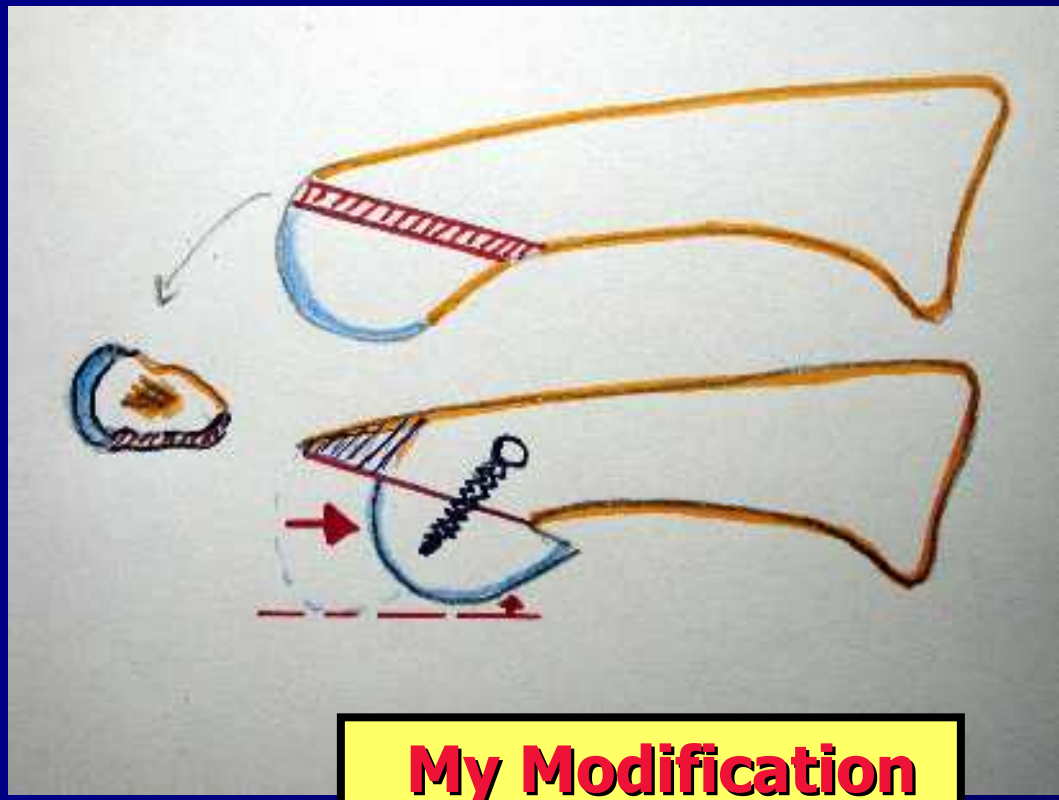
Better do both at initial surgery!

Classical Weil





Myerson modification



My Modification
Since 2001

Post-Mitchell 2. Mal Union: in Dorsi-Flexion

Dorsal open wedge

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 1st Metatarsal **or**
    - Need to shorten at the same time the 2nd (and 3rd PRN If the 1st is not longer than the 2nd or 3rd
  - HV angle <40° (30-40)
  - IM angle <14°
  - Need a Internal fixation

Ideal Indication:

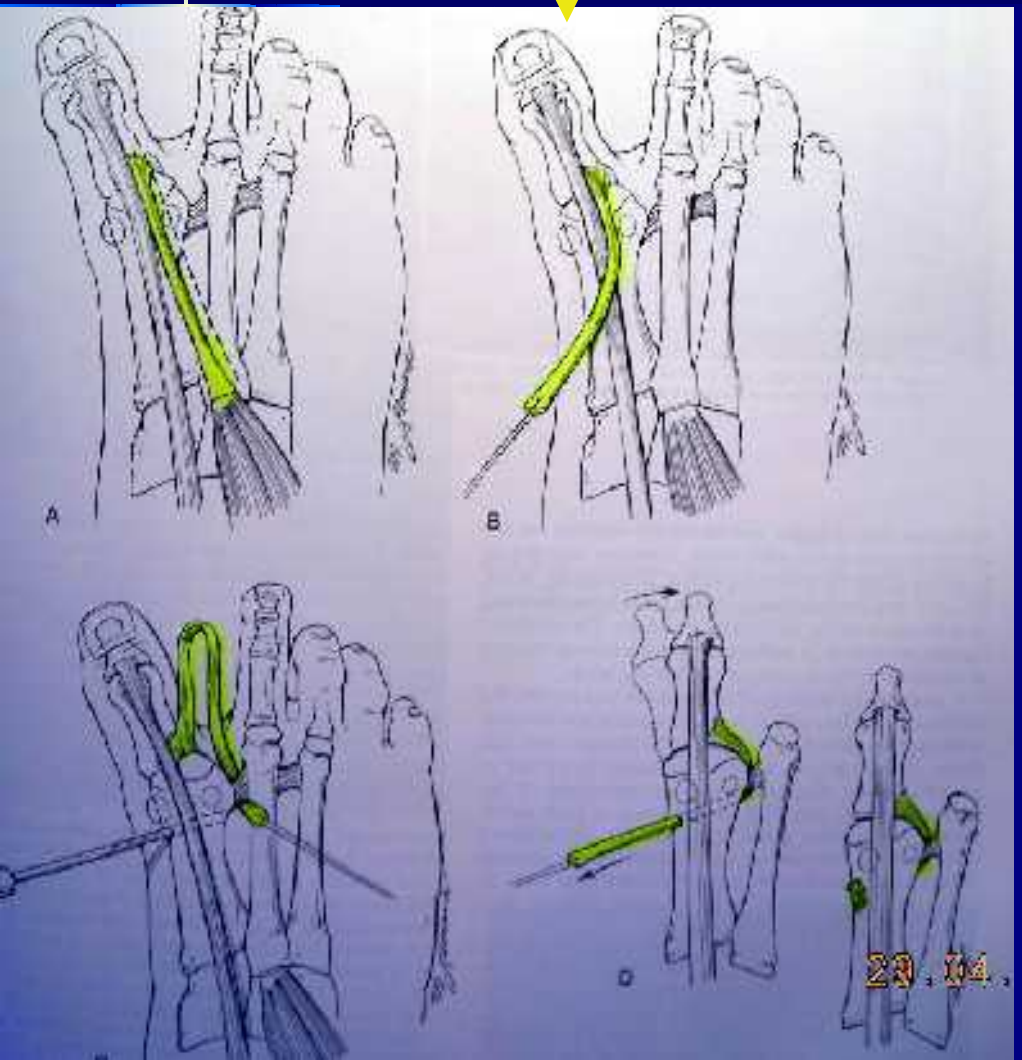
  - **H Valgus with some degenerative changes**
    - That some decompression is needed
    - Might be osteoporotic (witch is a contra-indication for screw fixation like in Ludloff, Scarf, Mann osteotomies)

Post-McBride

Post-Mc Bride: Hallux Varus

Hallux Varus –Treatment

*Extensor Hallucis Brevis (EHB) Procedure (Myerson)



- K. Johnson Classical: EHL tranfert:
  - 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

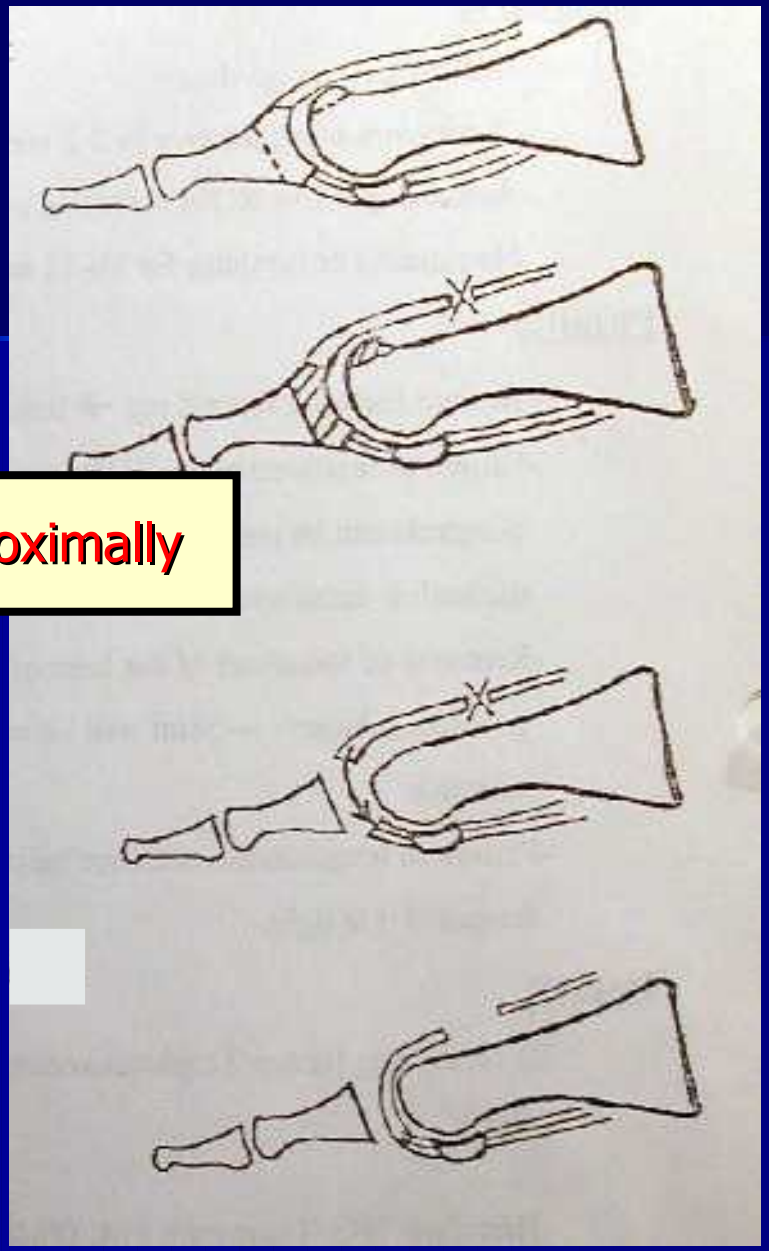
Less with Interpositionnal Bone Graf after Failed Keller

Late IP Degeneration: 15 % (3 time more in Women)
increase with HV angle >20°

Complications Post-1st 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



Excise ¼ Proximal P-1

1/3 resection for
Regular Keller

Cut EHB proximally

Free up Dorsal capsule
With EHB slide it down
To FHB

Bill Hamilton Capsular
interposition (modification
of Keller resection arthroplasty

If the joint cannot be salvage (arthrosis) After Distal Osteotomy(Chevron-Mitchell)

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

Valenti 1st 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
- **Complications after proximal osteotomy**
- Complications after Lapidus procedure

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

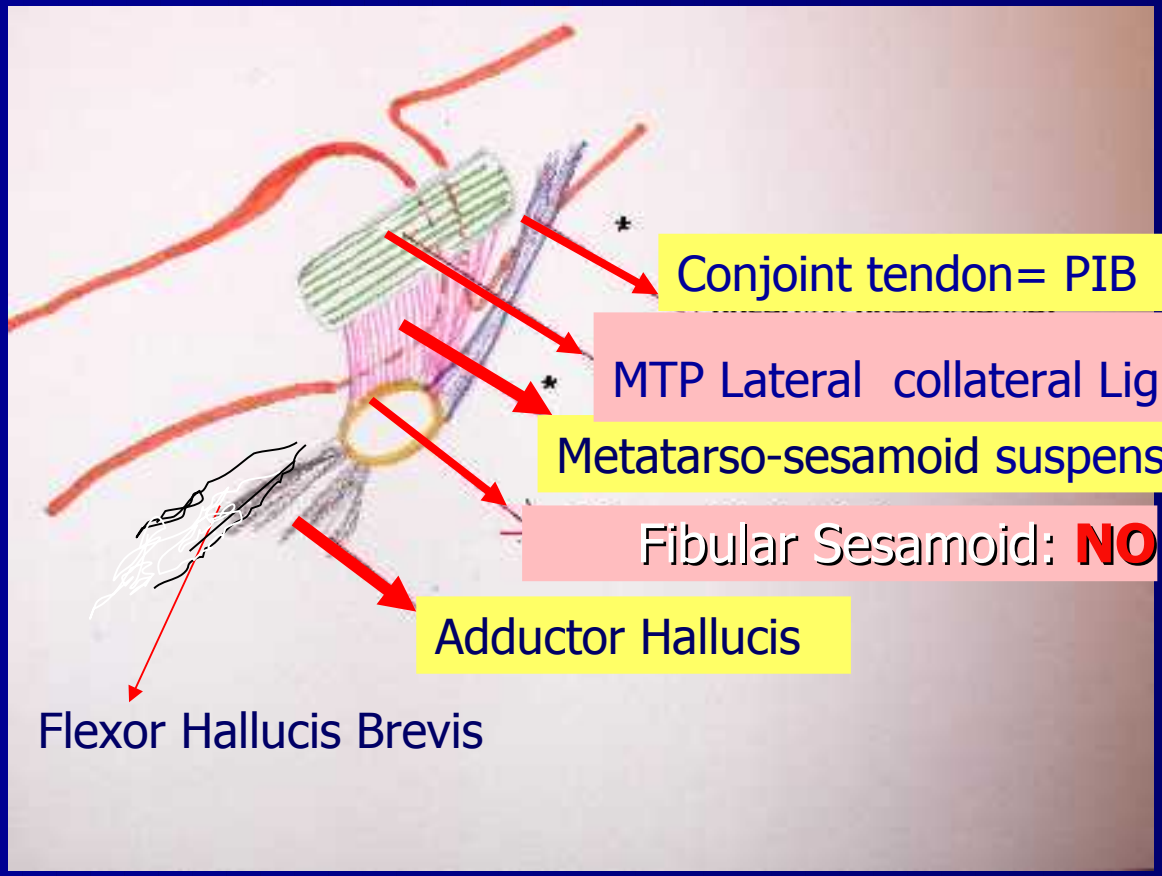
- Mal-Union
  - Dorsi-Flexion: Sometimes difficult to correct
    - **TX: Some type of plantar osteotomy**
    - If excessive shortening: BONE GRAFTING
  - Plantar-Flexion:
    - **Dorsi-Flexion osteotomy**

To avoid shortening : a crescentic osteotomy can be done in the sagittal plane

- Non-Union: rarely. If occurs: Bone grafting

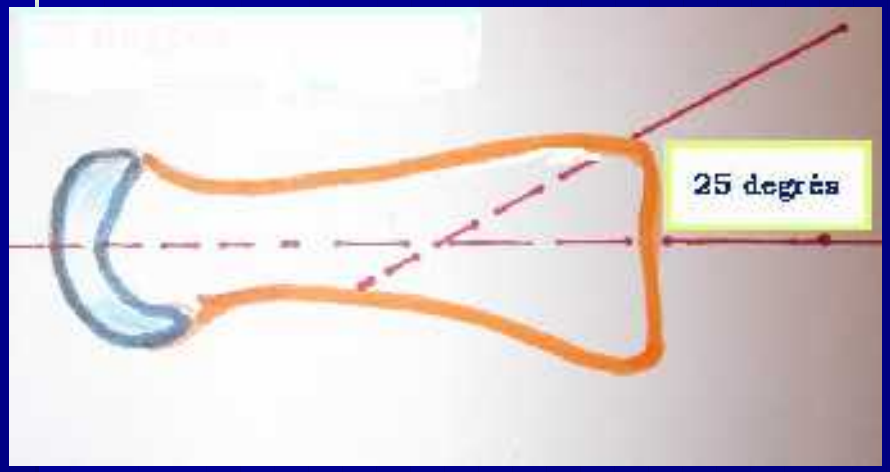
Hallux Varus after proximal osteotomy

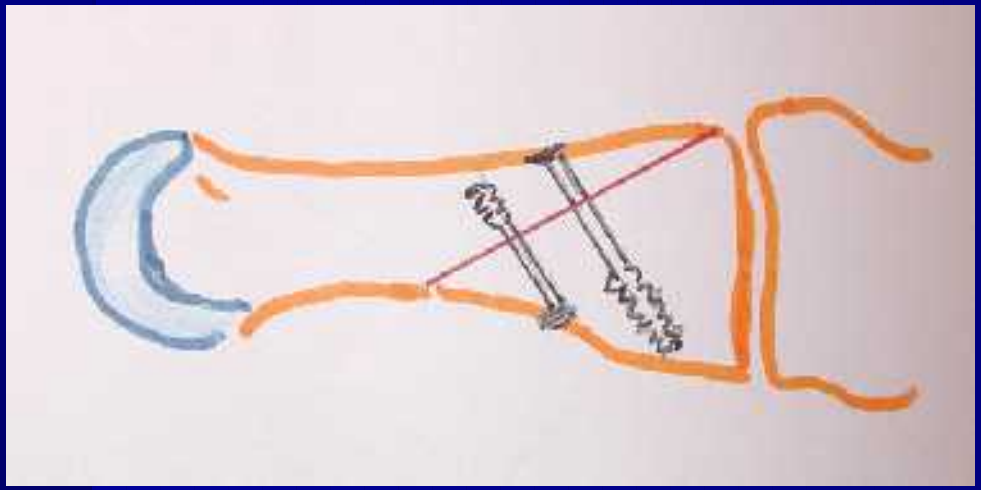
MTP Lateral Soft tissue

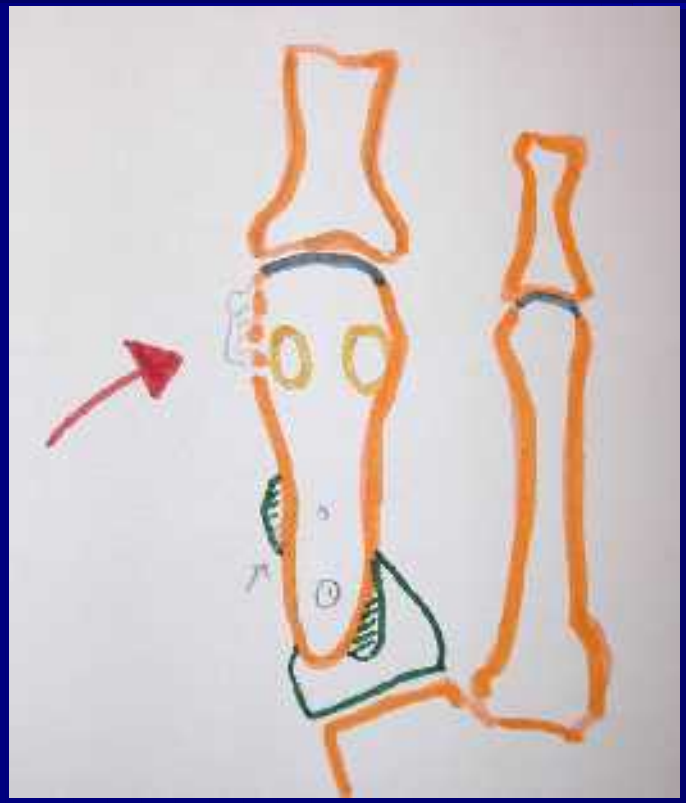


PIB= Phalangial Insertion Band

Ludloff Osteotomy

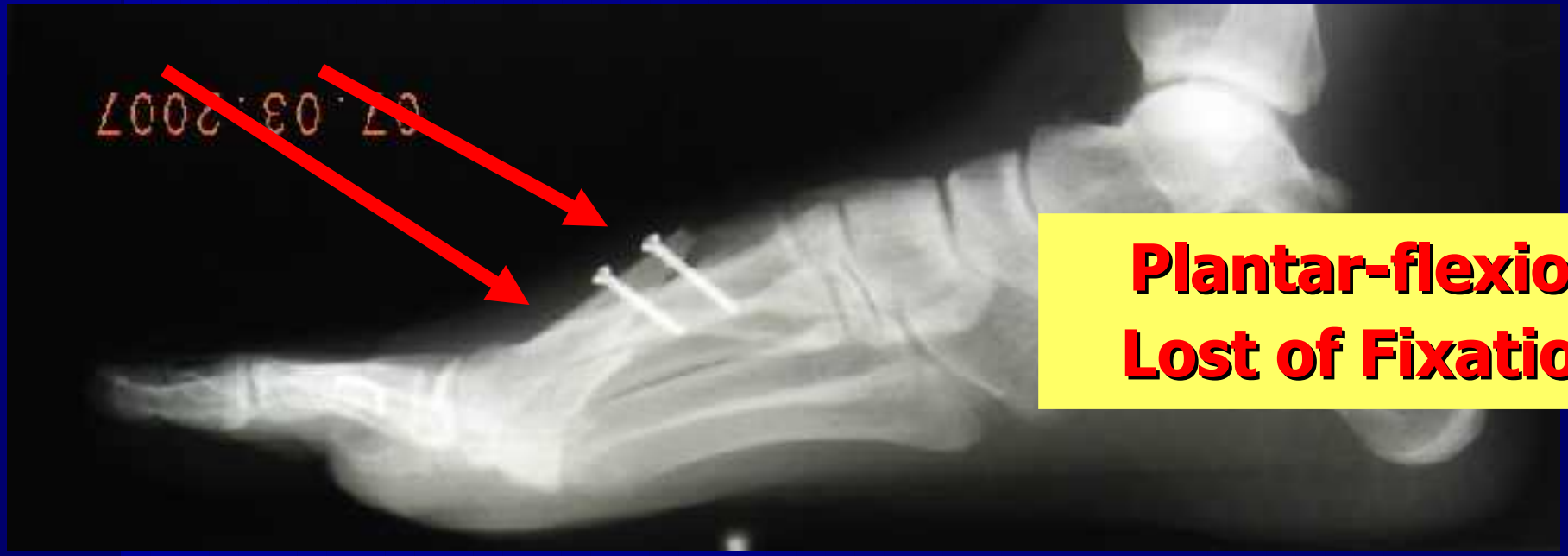




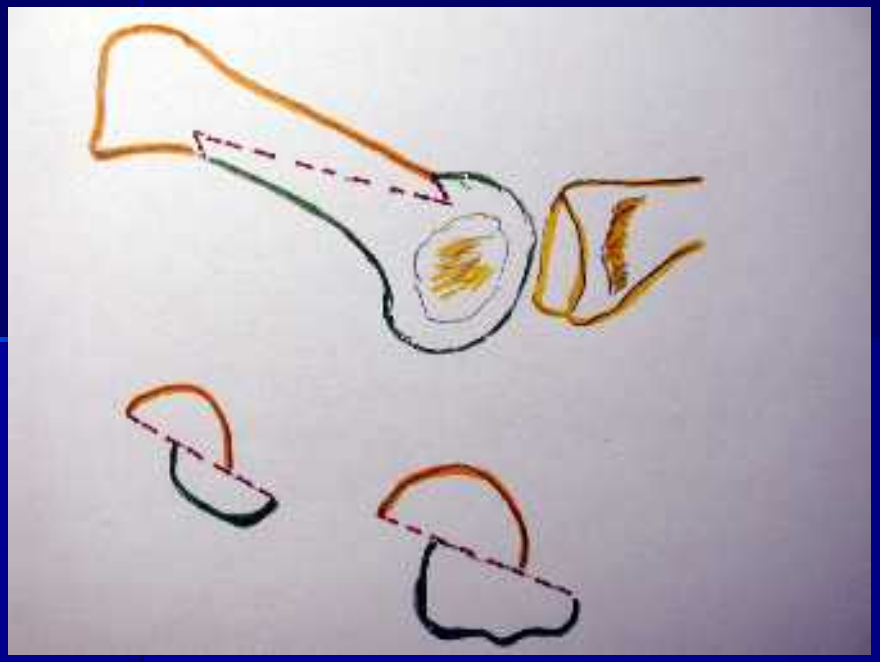


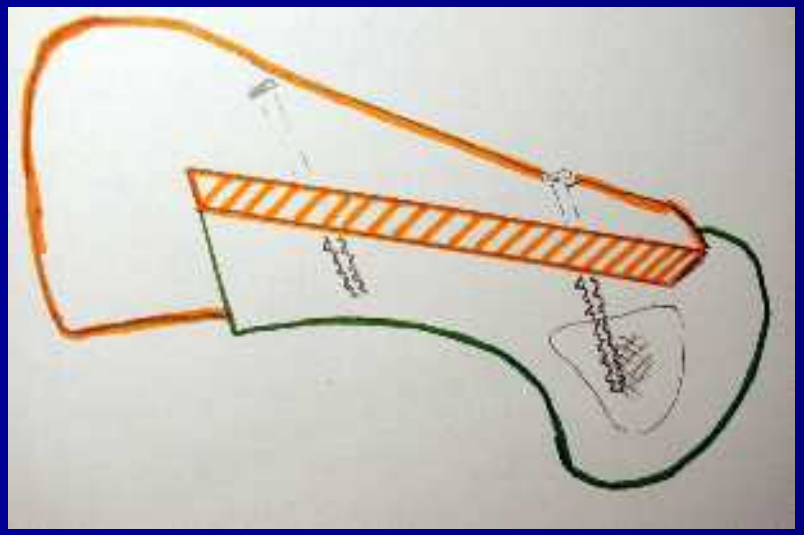
Modified Ludloff…Complications

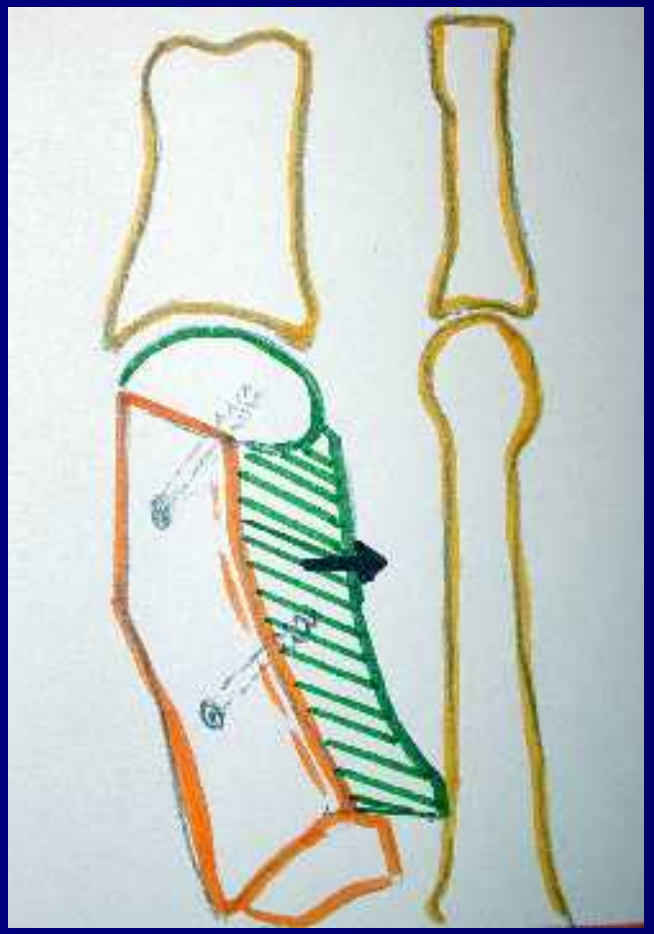
Modified Ludloff…Complications



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 (Learnig 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

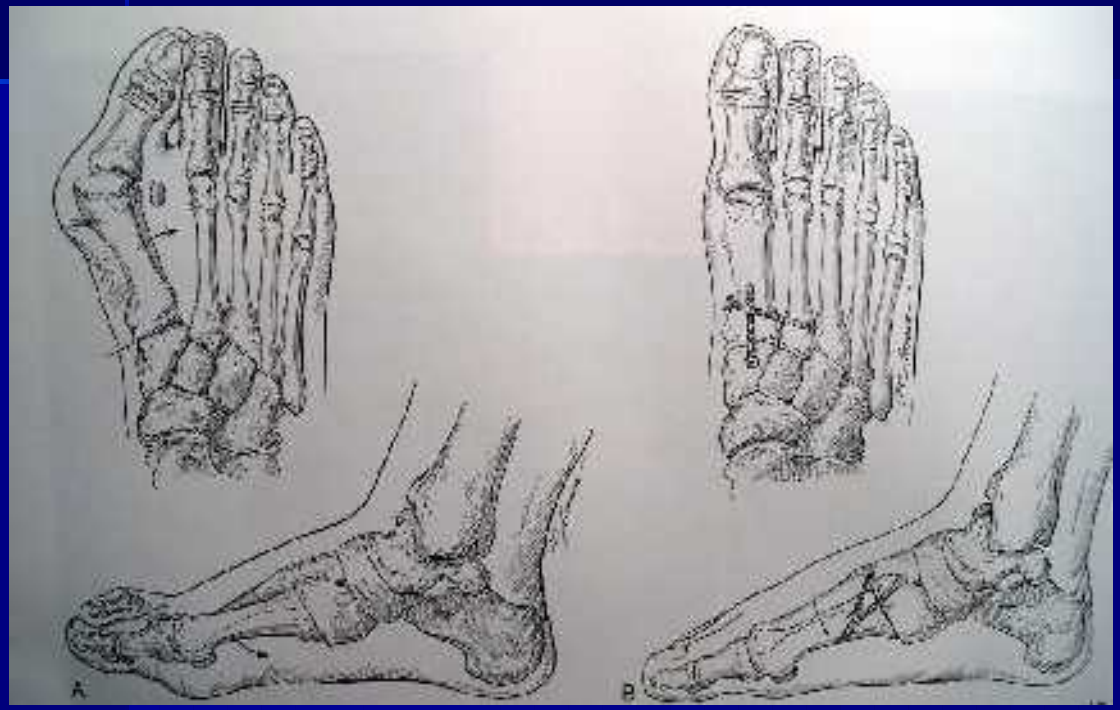
- 1. Non-union
- 2. Mal-Union: Dorsi-Flexion (mostly)
- 3. Excessive Shortening

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 2nd Metatarsal.

- **Review of All Orthopaedic surgeries witch 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