MINIMALLY INVASIVE SURGERY FOR FAILED OPEN FOOT SURGERY

Annual Hands-On MIS Cadaver Lab Seminar

February 21-23, 2024
Orlando, Florida

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Learning Objectives

- Outline general concepts
- Common reasons for revision surgery
- Types of revision surgery

MIS bunion correction offers advantages over open technique, but questions remain

One surgeon finds serious complications with the technique and calls it 'simply poor surgery.'

May 01, 2007

Orthopedicstoday

Issue: Issue 3 2007

After performing the standard chevron osteotomy for some time, Sandro Giannini, MD, and his colleagues turned to a minimally invasive bunion correction technique they named SERI – an acronym for simple, effective, rapid and inexpensive.

Giannini switched to this technique – performed through a 1-cm incision – "in order to have a more versatile procedure as well as the possibility to [treat] a posterior hallux valgus deformity," which is not possible with the chevron osteotomy, he said.

However, Mark S. Myerson, MD, is wary of the SERI technique. He has performed the technique and conducted a prospective, randomized study comparing it to the traditional chevron approach.

"Unfortunately, 2.5 months following initiation of the study, we had to abandon it, due to frequent complications," Myerson said. "Some of these complications were quite serious." He and Giannini debated the topic at the American Orthopaedic Foot and Ankle Society Specialty Day Meeting.

Introduction

- No one can deny the growing interest in the utility of minimally invasive surgery (MIS) to correct foot and ankle deformities

- MIS is performed using small, targeted incisions rather than large incisions required for open surgery

Minimally Invasive Foot & Ankle Surgery: A Review and a Novel Technique

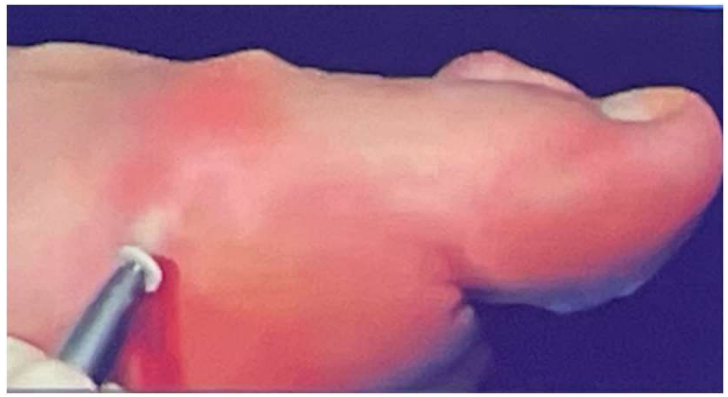
Derrick E. Wendler, MD, Gary W. Stewart, MD, Erroll J. Bailey, MD, Ademola I. Shofoluwe, MD, and Uzoma Nwaibu, MD

Foot Ankle Orthop. 2022 Oct; 7(4):
Published online 2022 Nov 22. doi:

Introduction

- Proposed benefits of MIS compared to traditional open foot surgery include:

1. Preservation of blood supply
2. Limited injury to adjacent soft tissue
3. Less post-op pain
4. Shorter operative time
5. Immediate weight bearing
6. Shorter or no hospital stay



Percutaneous Osteotomies in Hallux Valgus: A Systematic Review

Ana Bia [1], Francisco Guerra-Pinto [2], Bruno S Pereira [3], Nuno Corte-Real [4], Xavier Martin Oliva [5]

Review > J Foot Ankle Surg. 2018 Jan-Feb;57(1):123-130.

Introduction

- Despite advancements in primary correction of hallux values (HV), significant rates of re- operation remain across common techniques

- Some studies mention up to 50% complications following primary correction (Open and MIS)

A Systematic Review of Open and Minimally Invasive Surgery for Treating Recurrent Hallux Valgus

Surg J (N Y). 2022 Oct; 8(4): e350–e356
Published online 2022 Dec 21. doi: 10.1

Arun Nair, MBCHB,[1] Matthew Bence, MRCS,[1] Jawaad Saleem, MBBS,[1] Azka Yousaf, MBBS,[1] Lena Al-Hilfi, MBBS,[1] and Kumar Kunasingam, FRCS[1]

Common reasons for revision surgery

- Recurrent HV
- Cock-up deformity
- Transfer metatarsalgia / Pain
- Hallux varus
- Joint stiffness
- Cosmetic appearance

Procedures for revision surgery

- Distal first metatarsal osteotomy
- Removal of metalware
- Extensor tendon tenotomy. (MF, IF)
- Metatarsal osteotomy
- MP arthrodesis
- Lapidus surgery

Types of Revision Surgery

- MIS
- Distal metatarsal osteotomy
- Modified subcapital metatarsal osteotomy
- Soft tissue releases

- Open
- Scarf osteotomy
- Lapidus procedures
- First MTP arthrodesis

Limitations to compare MIS vs Open

- Inability to pool outcomes

  Different evidence levels of studies

- Inability to directly compare studies due to disparity

  Demographics - Age, Comorbidities

  Indications for surgery - Percutaneous, Mini-open

  Outcome measures - AOFAS, Date of measurement

orthotoolkit

AOFAS Hallux Metatarsophalangeal-Interphalangeal Scale

Patient Name: _____
Patient MRN: _____
Date: _____

I. Pain (40 points)

☐ None	+40
☐ Mild, occasional	+30
☐ Moderate, daily	+20
☐ Severe, almost always present	+0

II. Function (45 points)

Activity limitations

☐ No limitations	+10
☐ No limitation of daily activities, such as employment responsibilities, limitation of recreational activities	+7
☐ Limited daily and recreational activities	+4
☐ Severe limitation of daily and recreational activities	+0

Footwear requirements

☐ Fashionable, conventional shoes, no insert required	+10
☐ Comfort footwear, shoe insert	+5
☐ Modified shoes or brace	+0

MTP joint motion (dorsiflexion plus plantarflexion)

☐ Normal or mild restriction (75° or more)	+10
☐ Moderate restriction (30° - 74°)	+5
☐ Severe restriction (less than 30°)	+0

IP joint motion (plantarflexion)

☐ No restriction	+5
☐ Severe restriction (less than 10°)	+0

MTP-IP stability (all directions)

☐ Stable	+5
☐ Definitely unstable or able to dislocate	+0

Callus related to hallux MTP-IP

☐ No callus or asymptomatic callus	+5
☐ Callus, symptomatic	+0

III. Alignment (15 points)

☐ Good, hallux well aligned	+15
☐ Fair, some degree of hallux malalignment observed, no symptoms	+8
☐ Poor, obvious symptomatic malalignment	+0

IV. Total Score (100 points):

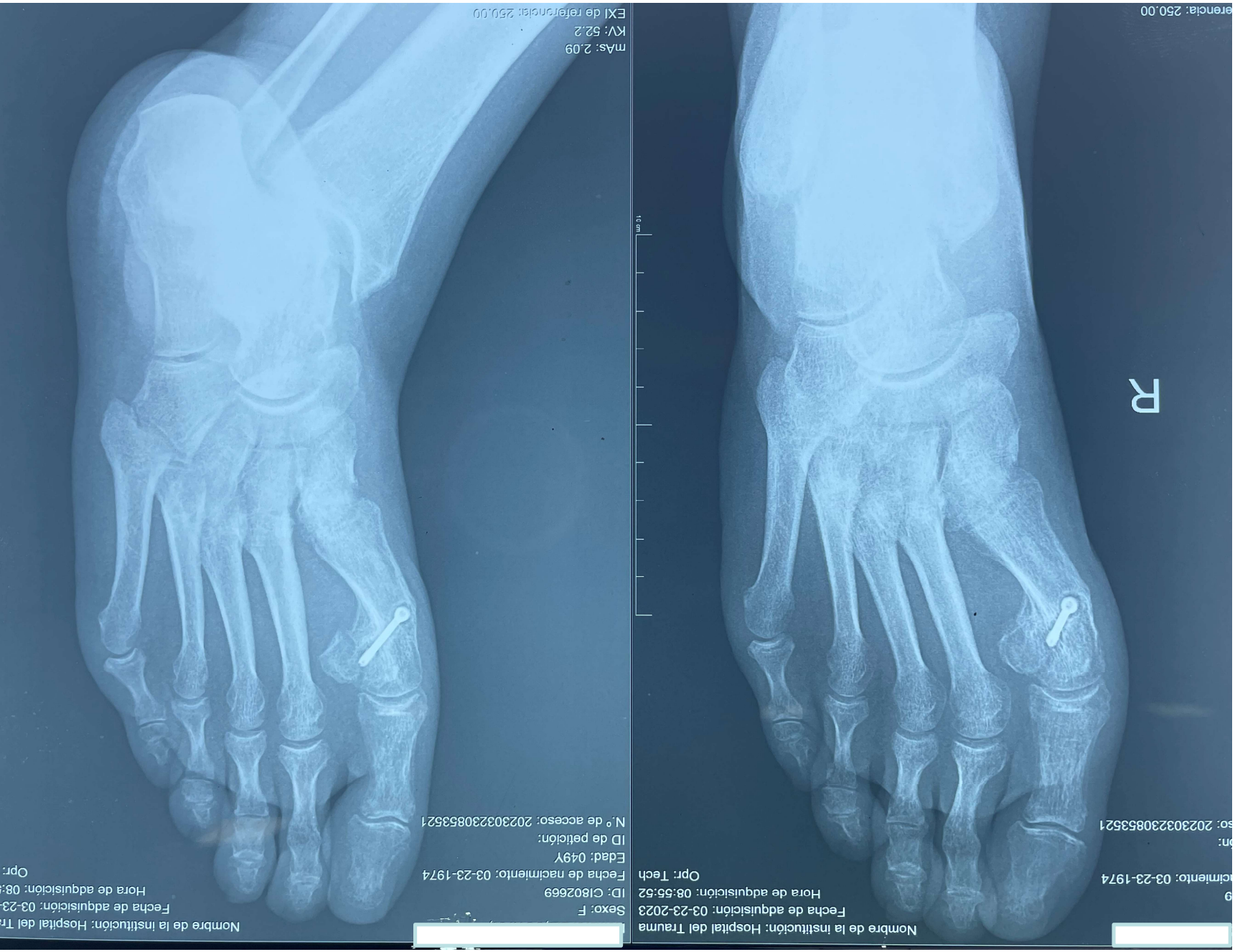
_____ Pain Points +
_____ Function Points +
_____ Alignment Points =

_____ Total Points/100 points

American Orthopedic Foot and Ankle Society Score (AOFAS).

Developed in 1994, the clinician-based AOFAS covers four different regions of the foot: The ankle-hindfoot, midfoot, metatarsophalangeal (MTP)-interphalangeal (IP) for the hallux, and MTP-IP for the lesser toes.

Cases



49y F. 2 previous open surgeries for HV; last surgery 6 months ago. Pain, recurrence of deformity + cock-up.

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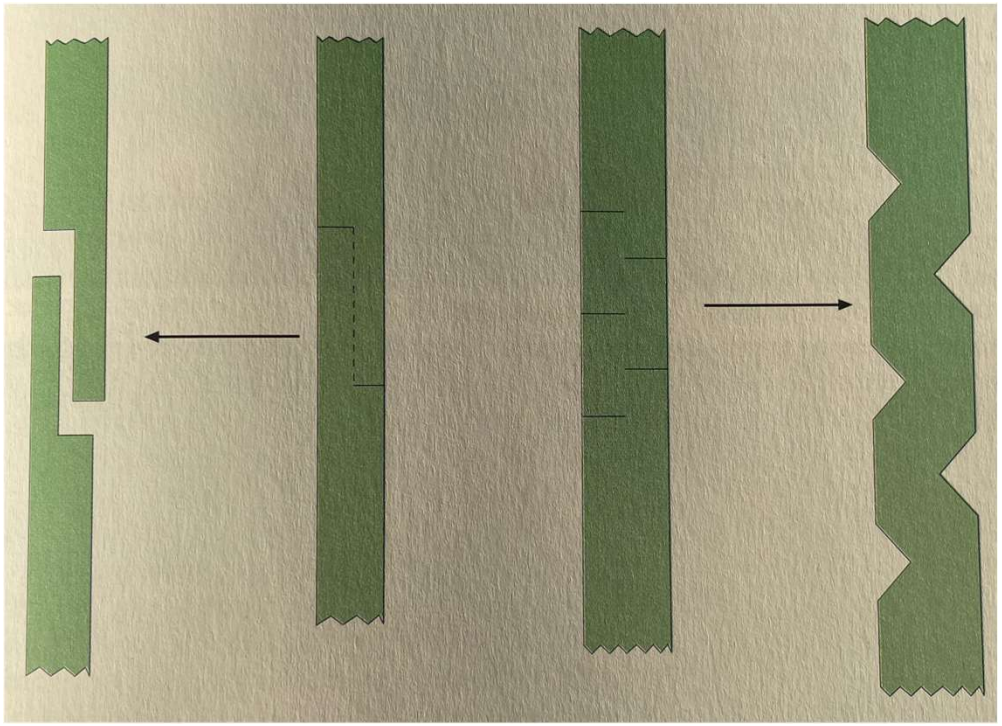
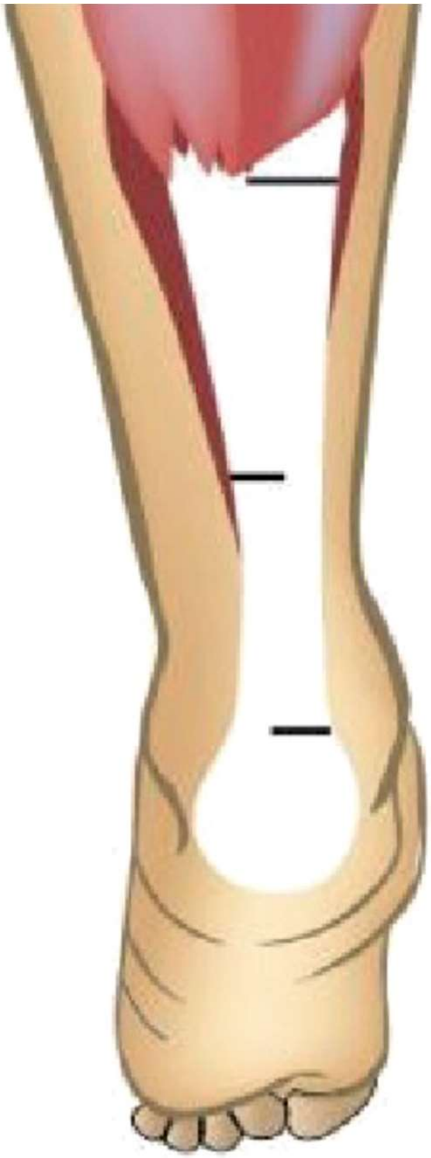
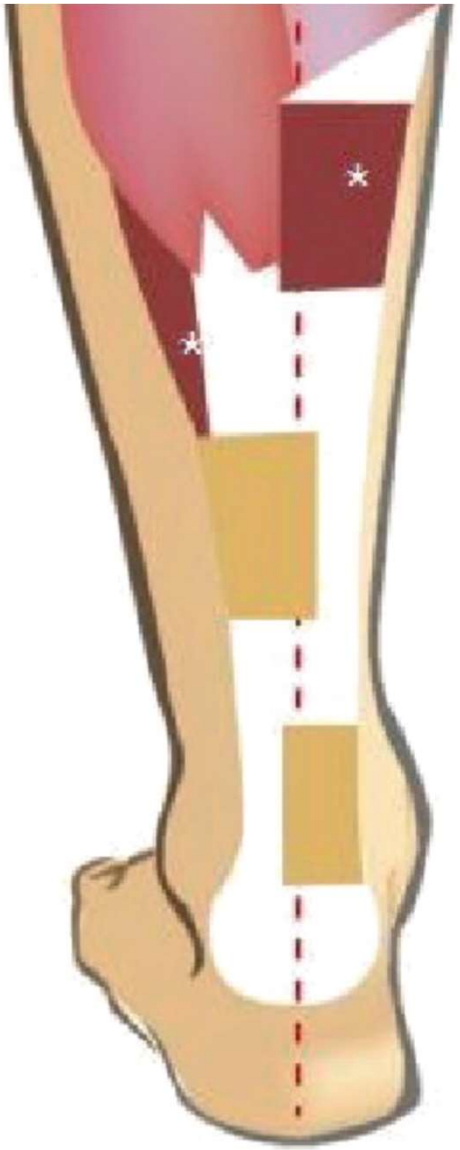
Procedures

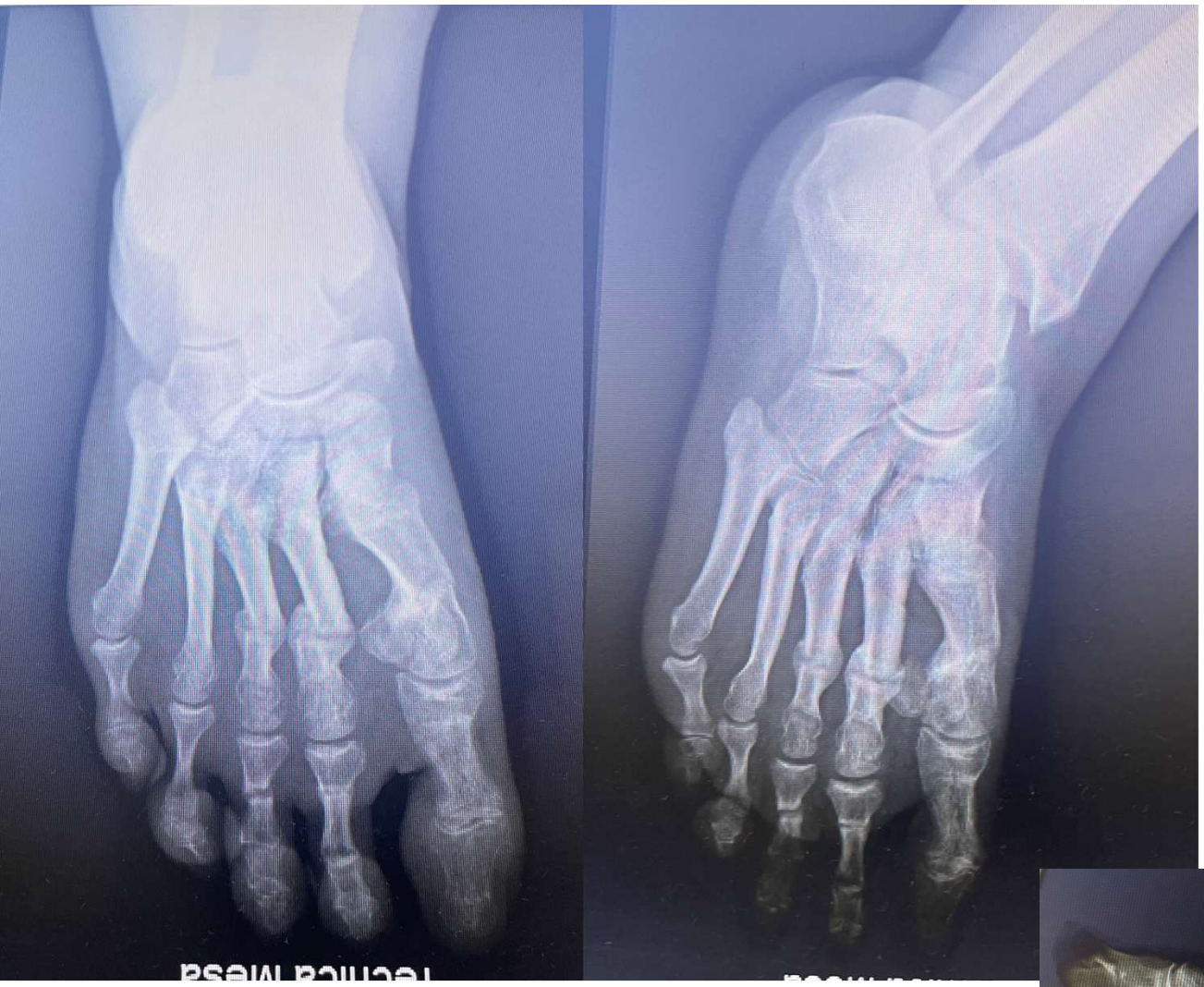
1- Removal of hardware
2- Reverdin-Isham osteotomy
3- First basal osteotomy
4- Hoke tenotomy - extensor tendon of the big toe
5- Akin tenotomy
6- Metatarsal osteotomy of 2nd + 3rd met at 2 levels
7- Proximal phal. osteotomy osteotomy
8- IP chondroplasty 2nd toe
9- Extensor tenotomy to 2,3,4 toes
10- Flexor tenotomy to 2,3 toes



Hoke’s tenotomy (1931)
Triple hemi-section lengthening







Outcomes

- Improvement in AOFAS scores

  38.3 MIS

  26.8 Open surgery

- Median post-op reduction in IMA + HVA

  5.6 and 18.4 degrees MIS

  4.4 and 15.5 degrees Open surgery

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Conclusions

- Current literature suggests that MIS techniques did not show worse outcomes or safety concerns compared to open techniques
- Exploring and developing percutaneous methods in MIS techniques provides an exciting possibility for revision HV and other foot pathology

Conclusions

Tables have turned around:

- Previously, open surgery to salvage MIS
- Now, MIS procedures con correct open surgery

THANK YOU