THE MINIMALLY INVASIVE ZADEK OSTEOTOMY

Hands-On Cadaver Seminar

February 21-23, 2024
Celebration, Florida

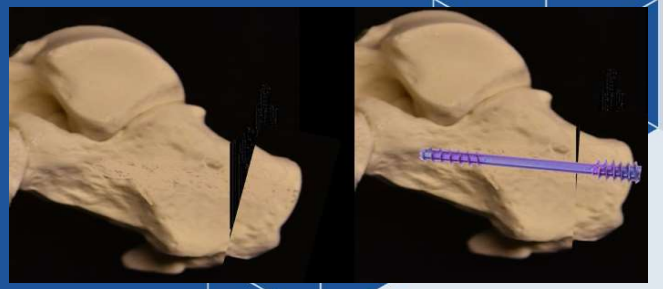
Dr. med. Frank Mattes

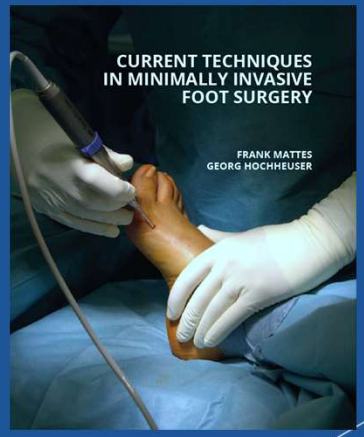
Frank Mattes MD

Orthopedic Surgeon, Trauma Surgeon, General Surgeon

Board member section minimally invasive foot surgery (German Society for Foot Surgery (Gffc))

Board member InterAlpes Foot and Ankle Academy





interALPES
foot and ankle academy
Ausbildung auf höchstem Niveau

Academy of
Minimally Invasive
Foot & Ankle
Surgery

Conflict of Interest Diclosure

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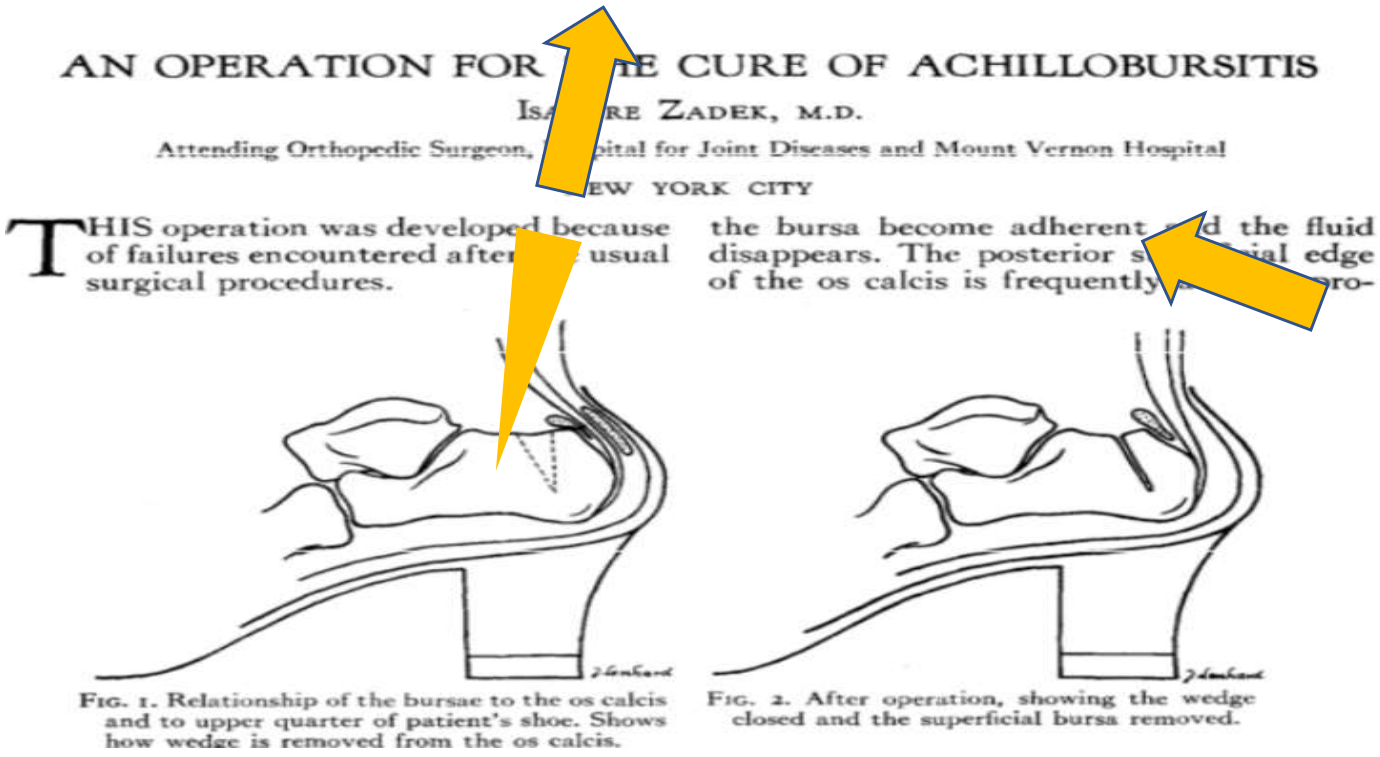
What is a Zadek Osteotomy ?

It`s a dorsal closing wedge osteotomy of the calcanues

Dorsal closing wedge calcaneal osteotomy (=DCWCO)



AN OPERATION FOR [illegible]E CURE OF ACHILLOBURSITIS

ISA[illegible]RE ZADEK, M.D.

Attending Orthopedic Surgeon, [illegible]pital for Joint Diseases and Mount Vernon Hospital

[illegible]EW YORK CITY

THIS operation was developed because of failures encountered after [illegible] usual surgical procedures.

the bursa become adherent [illegible]d the fluid disappears. The posterior s[illegible]ial edge of the os calcis is frequently [illegible]ro-

FIG. 1. Relationship of the bursae to the os calcis and to upper quarter of patient's shoe. Shows how wedge is removed from the os calcis.

FIG. 2. After operation, showing the wedge closed and the superficial bursa removed.

Indication

Failed conservative insertional Achillodynie/ Haglund Deformity

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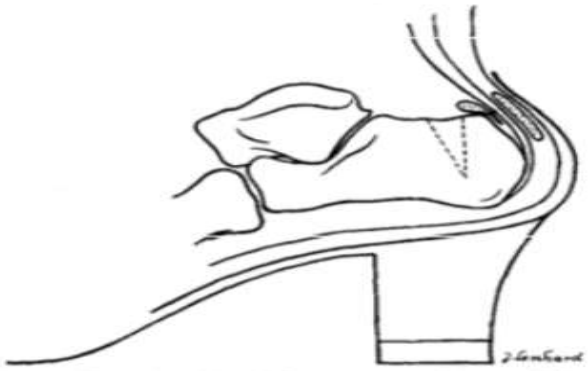

FIG. 1. Relationship of the bursae to the os calcis and to upper quarter of patient's shoe. Shows how wedge is removed from the os calcis.

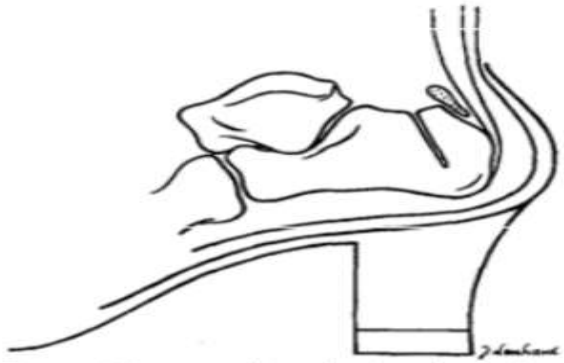

FIG. 2. After operation, showing the wedge closed and the superficial bursa removed.

There are existing two types of osteotomy

1 Zadek Osteotomy (1939)

Zadek I: Am J Surg, **1939,** 43, 542-546

2 Keck and Kelly Osteotomy (1965)

KECK SW, KELLY PJ. BURSITIS OF THE POSTERIOR PART OF THE HEEL; EVALUATION OF SURGICAL TREATMENT OF EIGHTEEN PATIENTSJ Bone Joint Surg Am. **1965** Mar;47:267-73.

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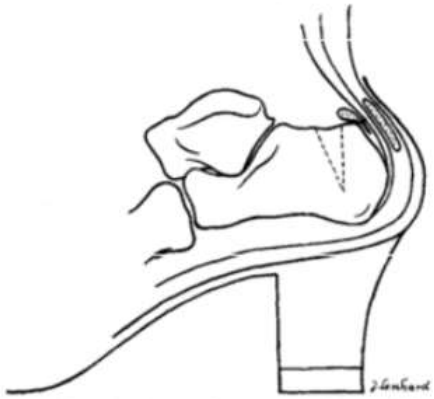

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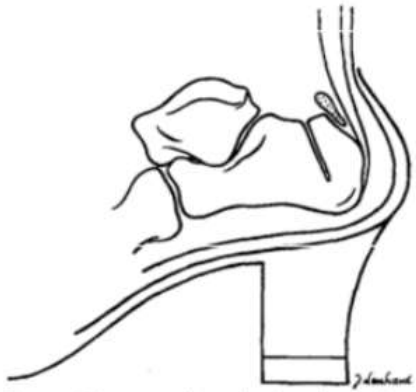
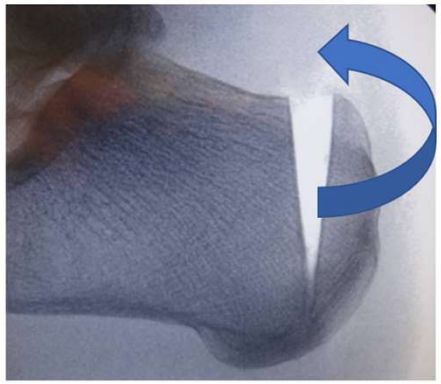


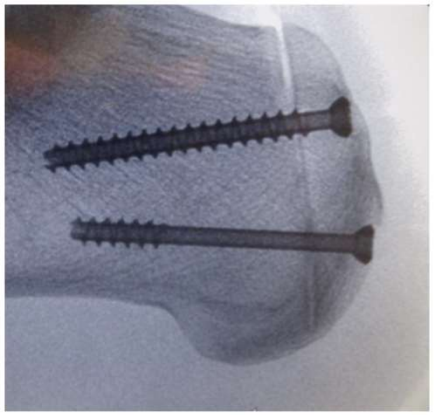
FIG. 2. After operation, showing the wedge closed and the superficial bursa removed.

Keck and Kelly
A vertical closing-wedge osteotomy at the posterior end of the calcaneus

The Idea:
To relocate the insertion area of the achilles tendon more distally

→ **more space for the achilles tendon**





Keck and Kelly

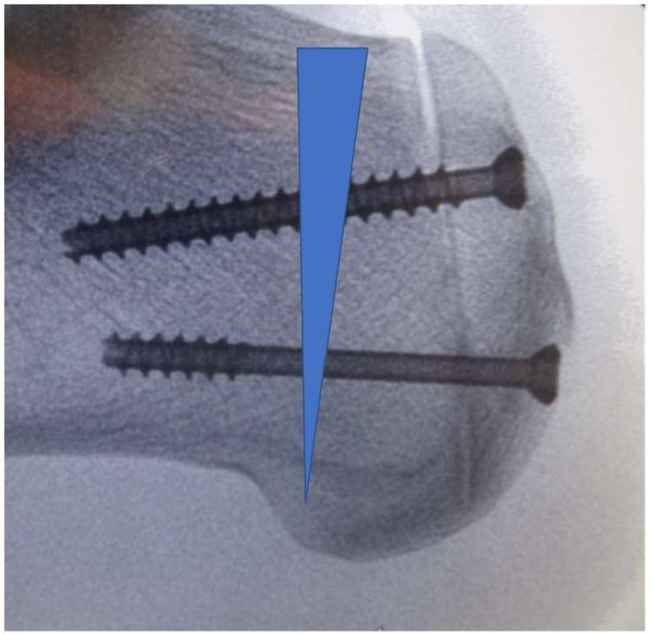
A vertical closing-way osteotomy at the posterior end of the calcaneus

The Idea:

To relocate the insertion area of the achilles tendon more distally

→ **more place for the achilles tendon**

Zadek did the same but more distally



Is this difference important?

Keck and Kelly

A vertical closing-way osteotomy at the posterior end of the calcaneus

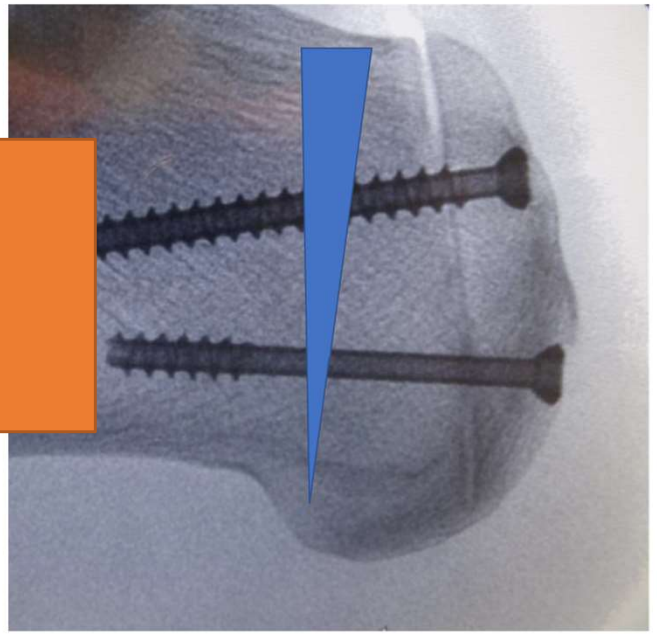
The Idea:

To relocate the insertion area of the achilles tendon more distally

→ **more pl**

Yes: The wedge determines whether the heel is changed in the horizontal plane (whether it flattens)

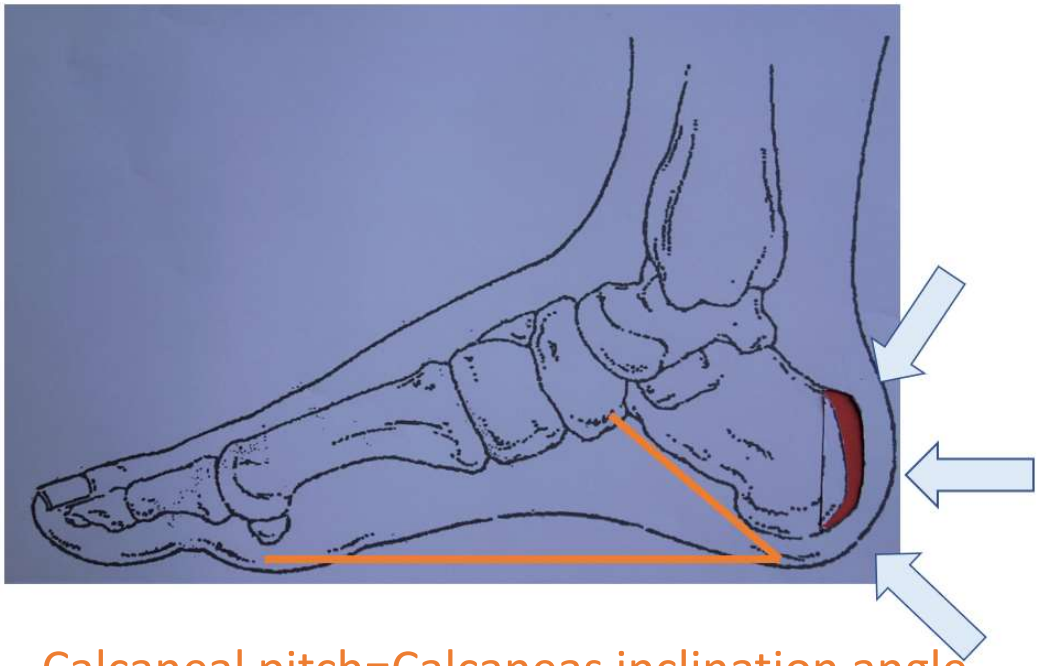
Zadek did the same but more distally



Is this difference important?

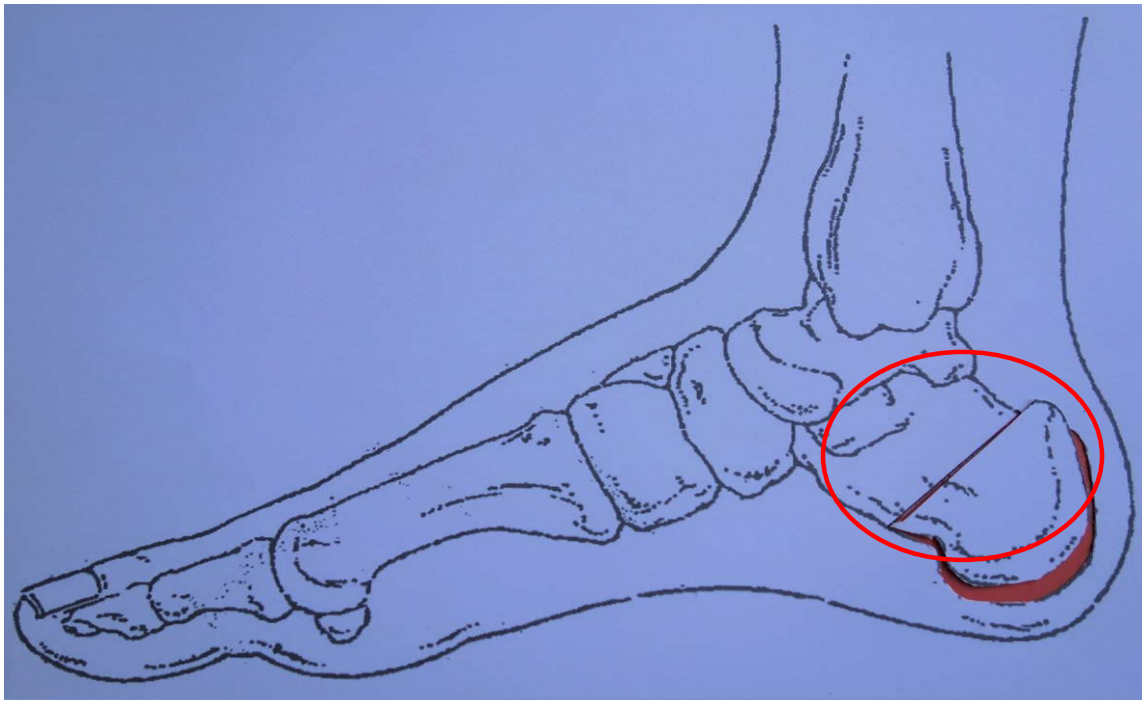
With an Keck and Kelly osteotomy the calcaneus becomes shorter.

→ But the calcaneus inclination angle does not change

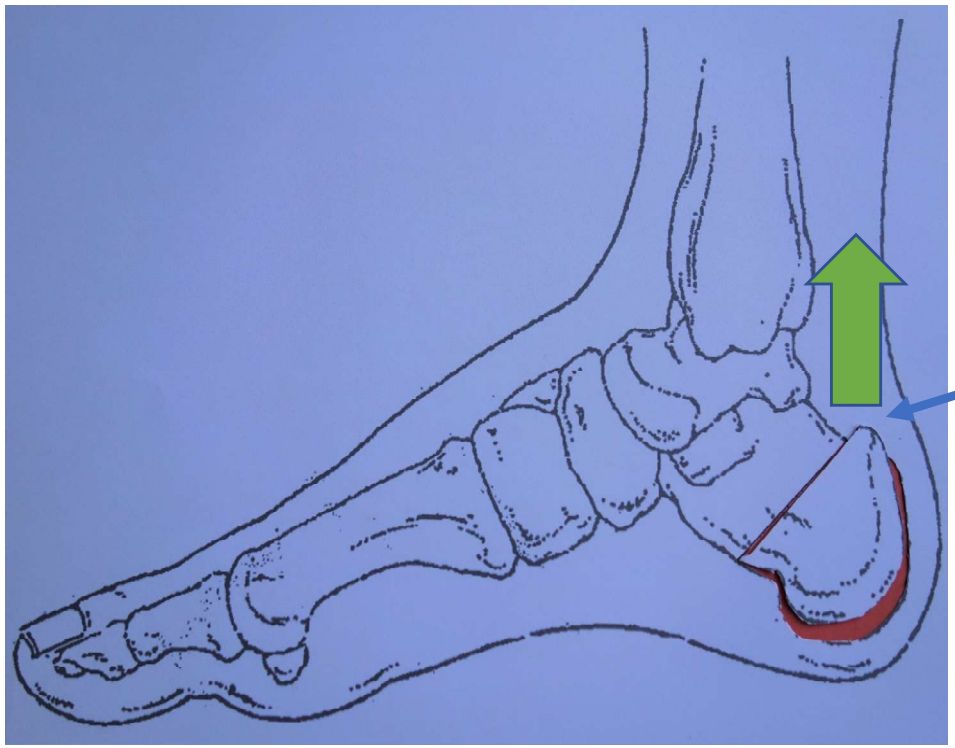


Calcaneal pitch=Calcaneas inclination angle

If the osteotomy is more distal and more horizontal…….

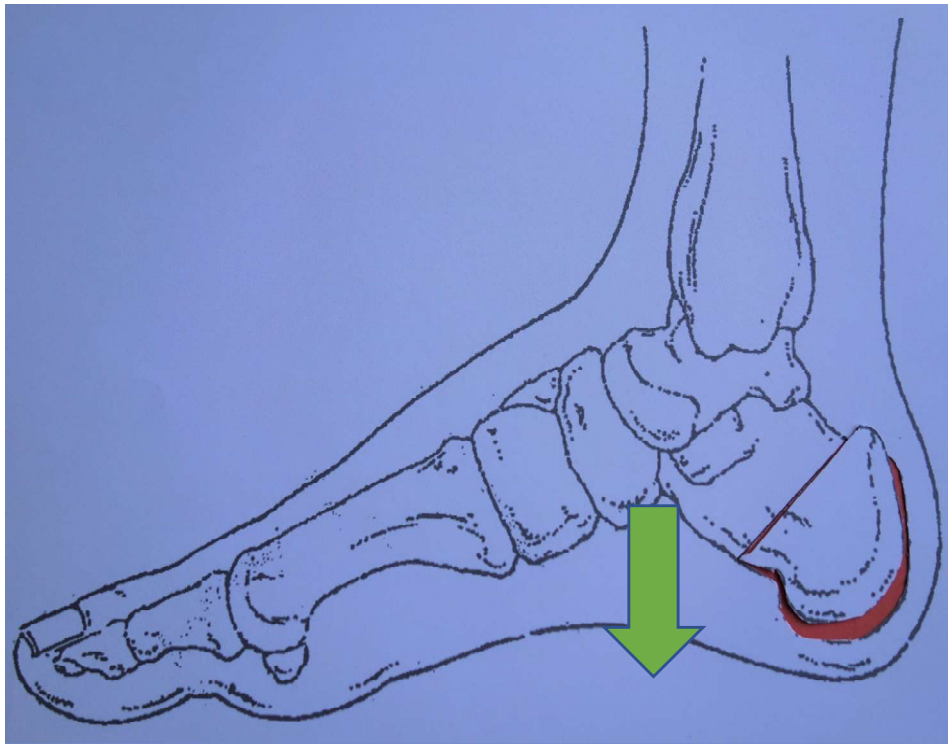


If the osteotomy is performed more distally and more horizontally…….



the tuber of the calcaneus will be raised

If the osteotomy is more distal and more horizontal…….



the foot becomes flatter
(good in a cavus foot)

My technique

Pat. in lateral position

tight tourniquet (not closed)

general anaesthesia

Medial foot is is positioned on the mini x ray image converter

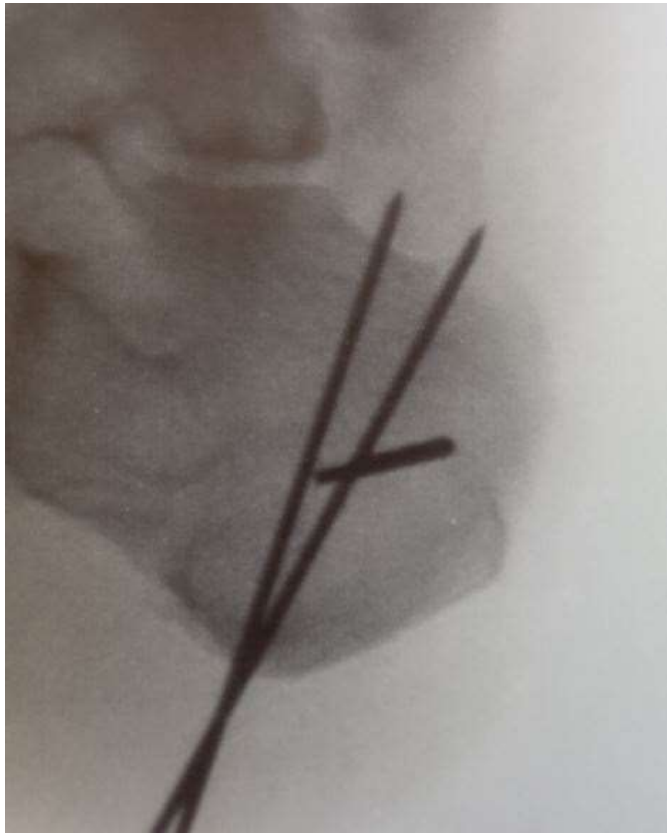
Marking the screw position saves time and X-rays

The size and position of the wedge will determined wit 2 plantar 2 mm k wires

We need a intact plantar hinge

Incision etween the K-wires under x-ray control

Location of the burr will be x-ray controlled



Wich burr ?

For the osteotomy

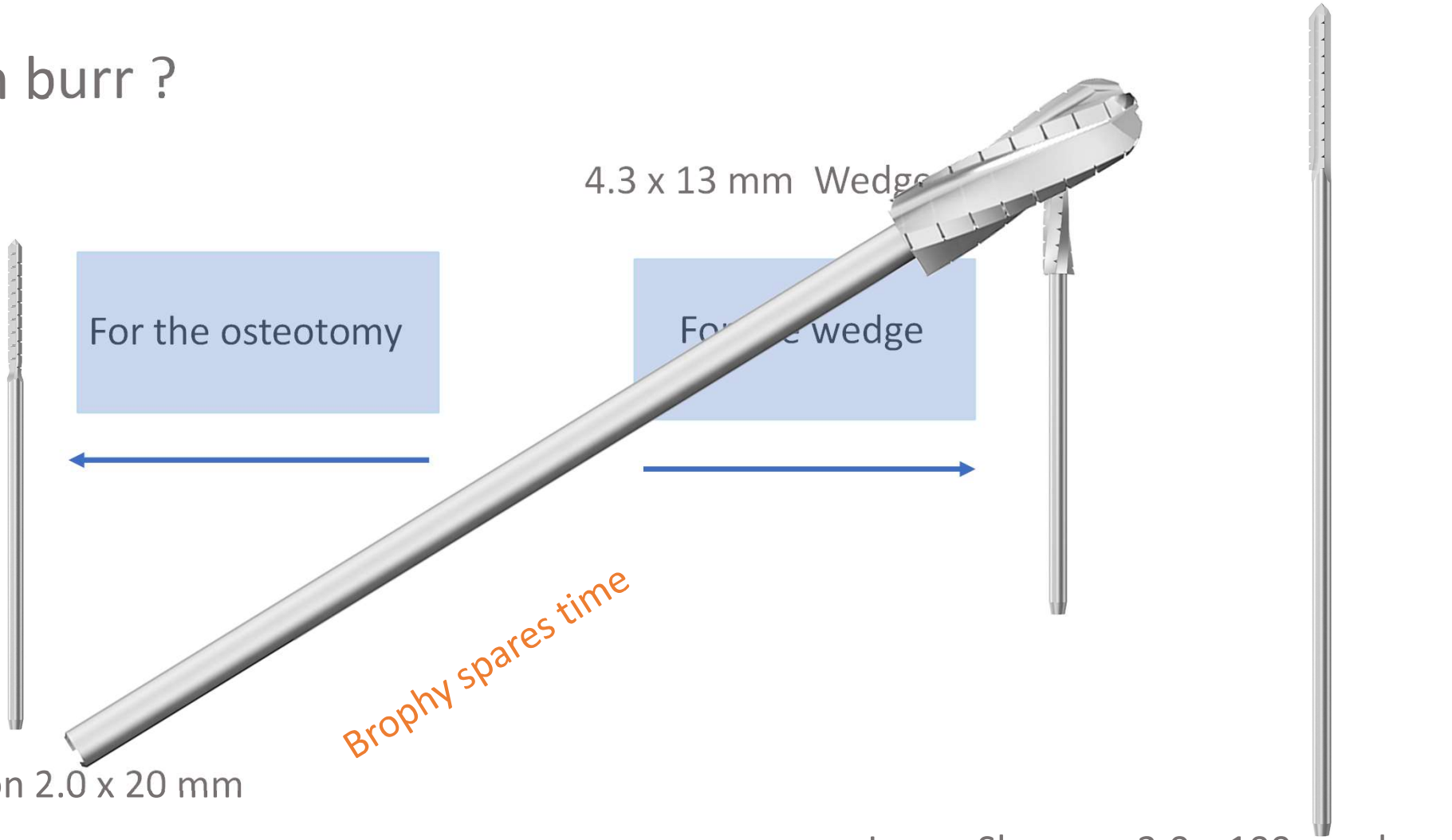
Shannon 2.0 x 20 mm

4.3 x 13 mm Wedge Burr

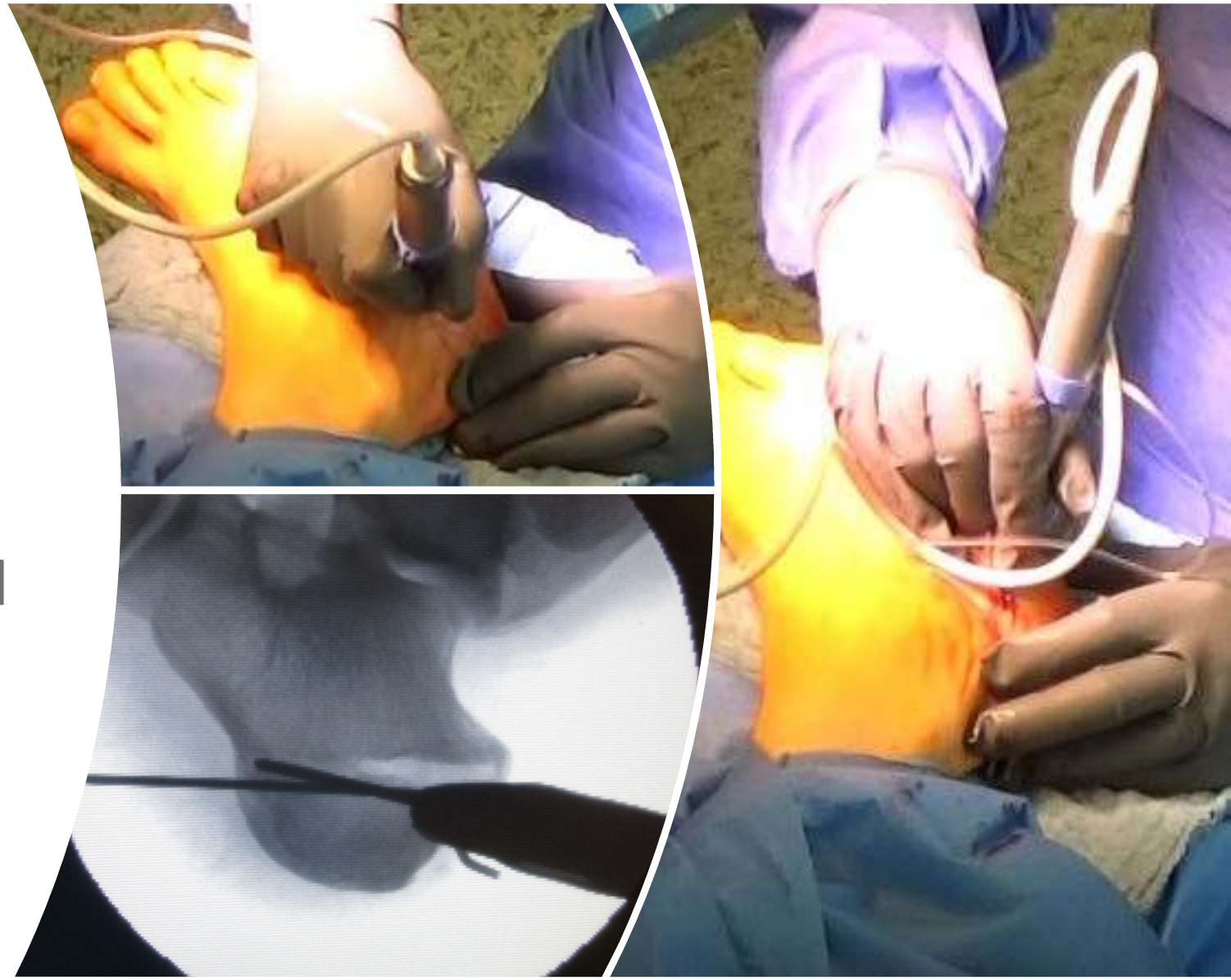
For the wedge

Lange Shannon 3.0 x 100mm lang

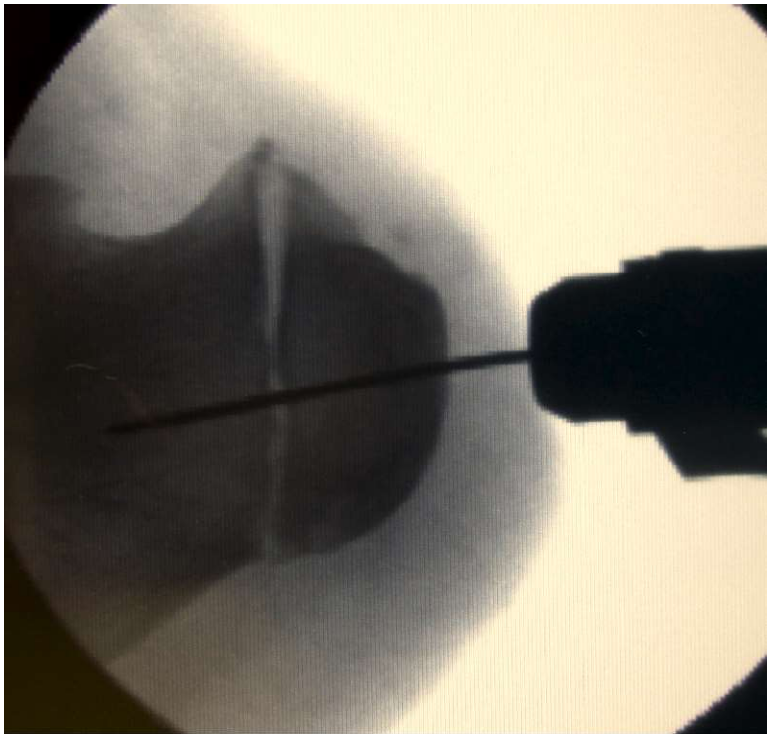
Wich burr ?


4.3 x 13 mm Wedge
For the osteotomy
For the wedge
Brophy spares time
Shannon 2.0 x 20 mm
Lange Shannon 3.0 x 100mm lang

Now the wedge will be removed

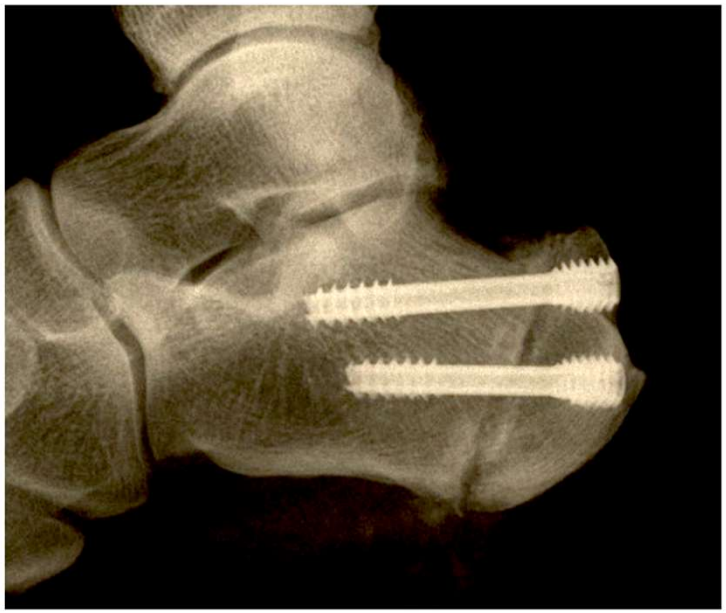


Bring in the first K-wire

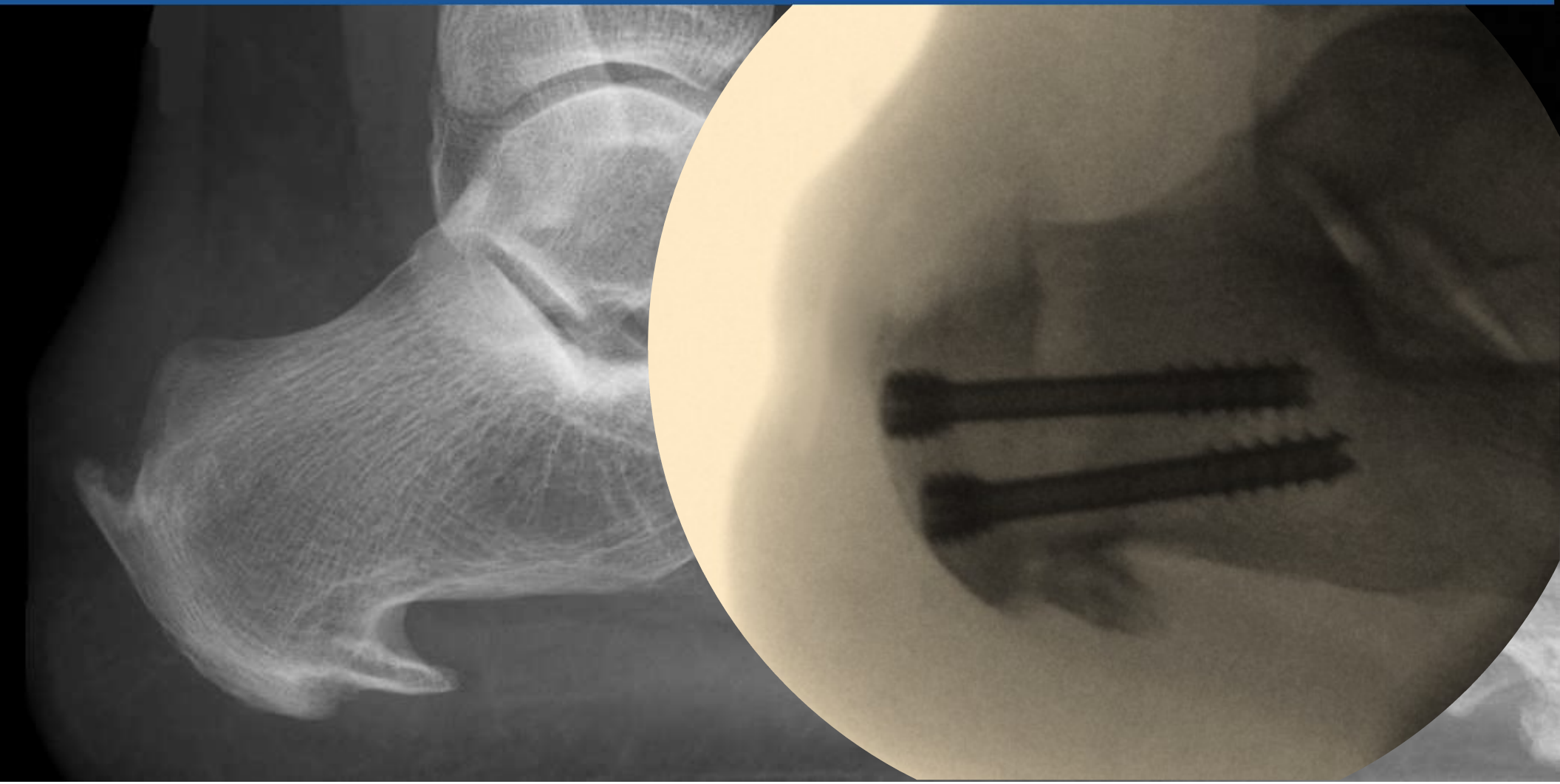


The gap is closed and 1 or 2 6.5 mm screws are used

With intact plantar hinge 1 screw without 2 screws

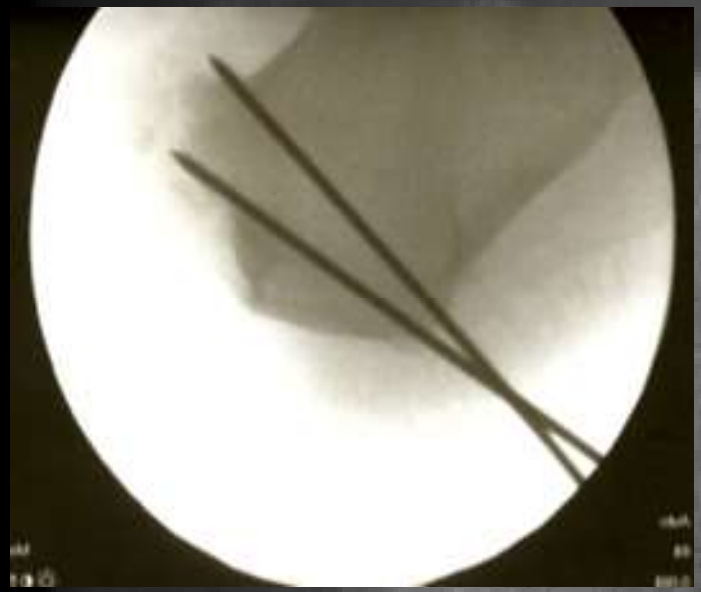


Disturbing exostoses can still be milled off percutaneously or removed mini open



This I would remove mini open

In such cases my wedge is based in the haglund deformity



When do a Zadek, When do a Calcaneoplasty ?

Use The X/Y Ratio

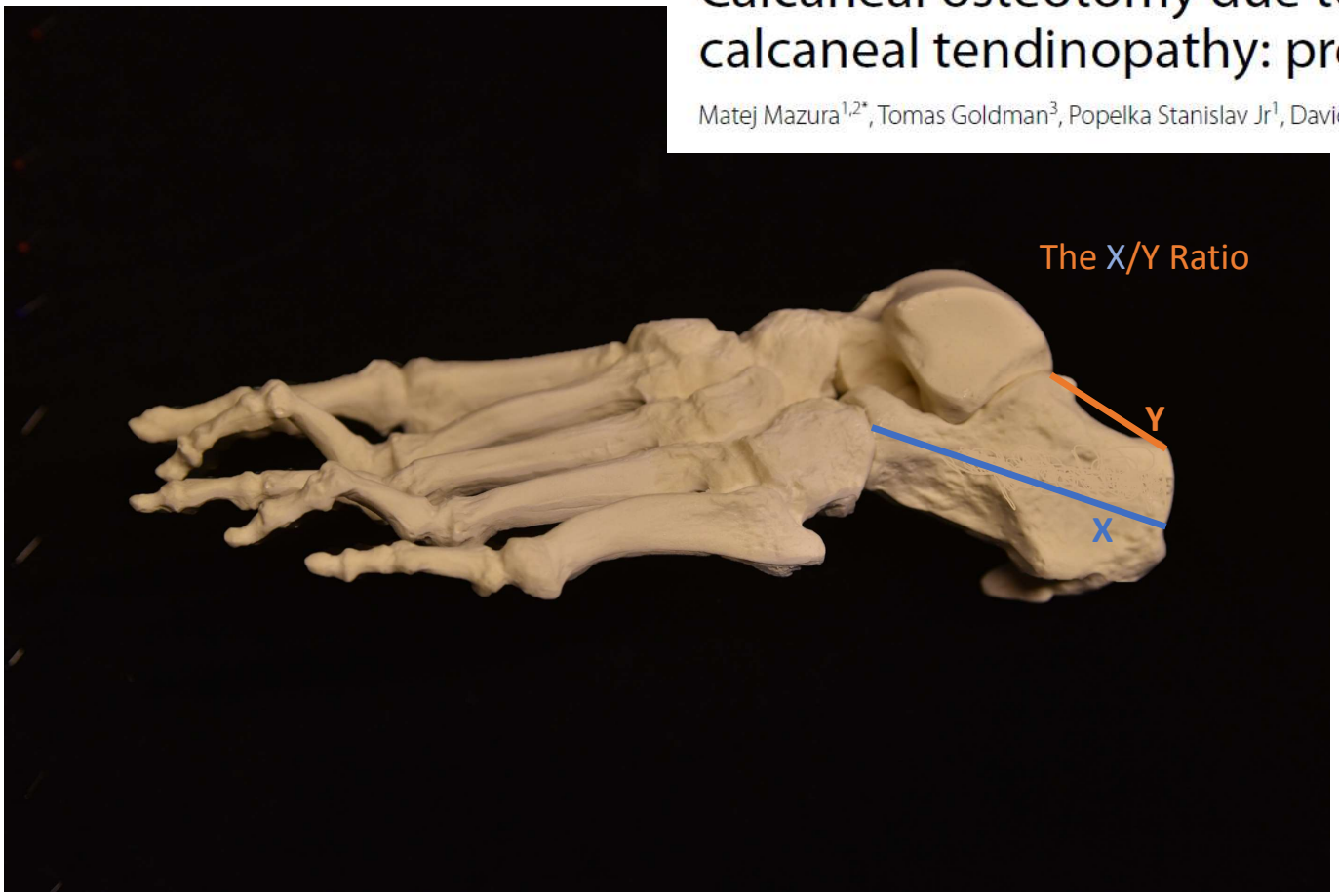
Mazura *et al.*
Journal of Orthopaedic Surgery and Research (2022) 17:478
https://doi.org/10.1186/s13018-022-03359-z

Journal of Orthopaedic Surgery and Research

RESEARCH ARTICLE Open Access

Calcaneal osteotomy due to insertional calcaneal tendinopathy: preoperative planning

Matej Mazura[1,2*], Tomas Goldman[3], Popelka Stanislav Jr[1], David Kachlik[2] and Rastislav Hromadka[1]



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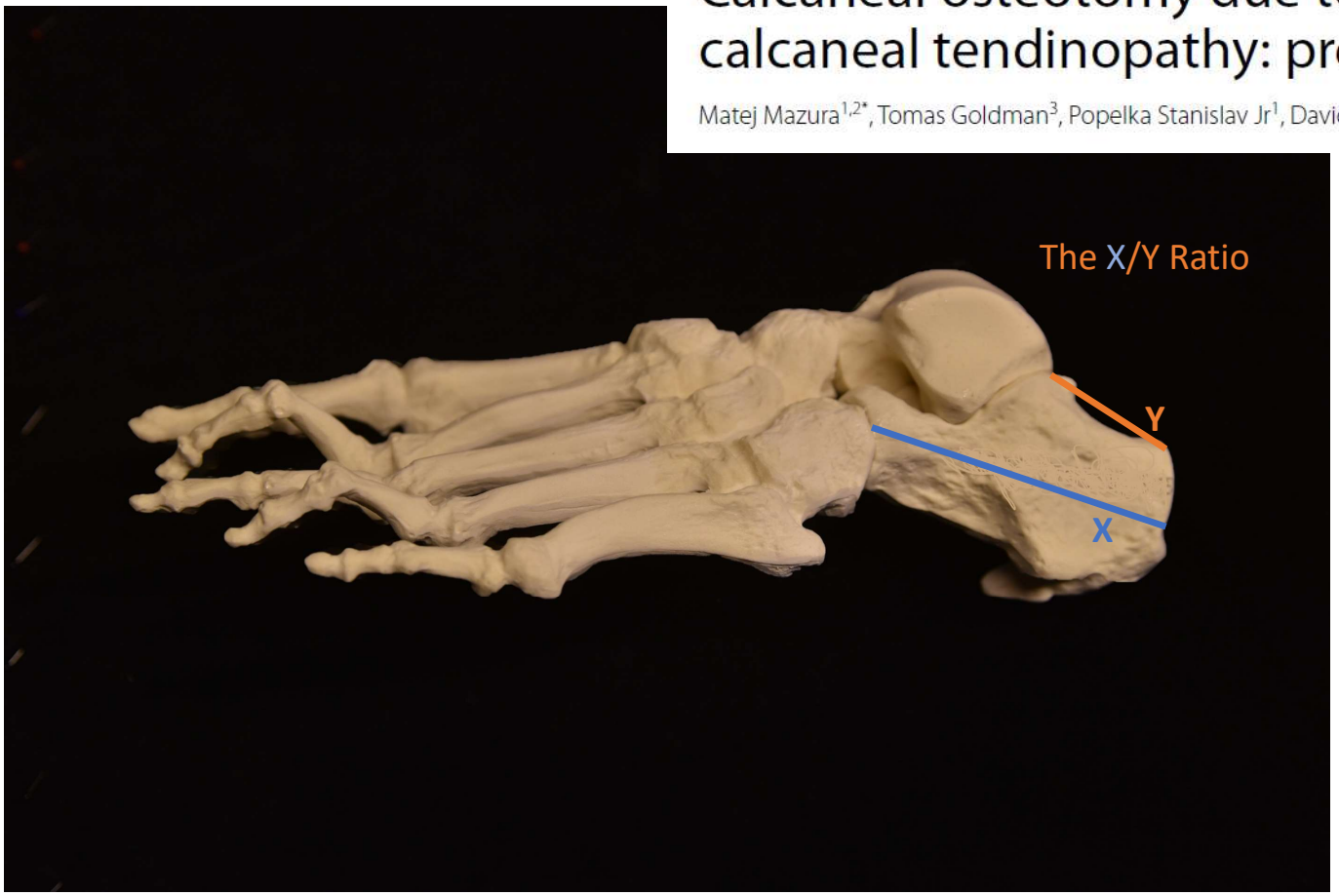

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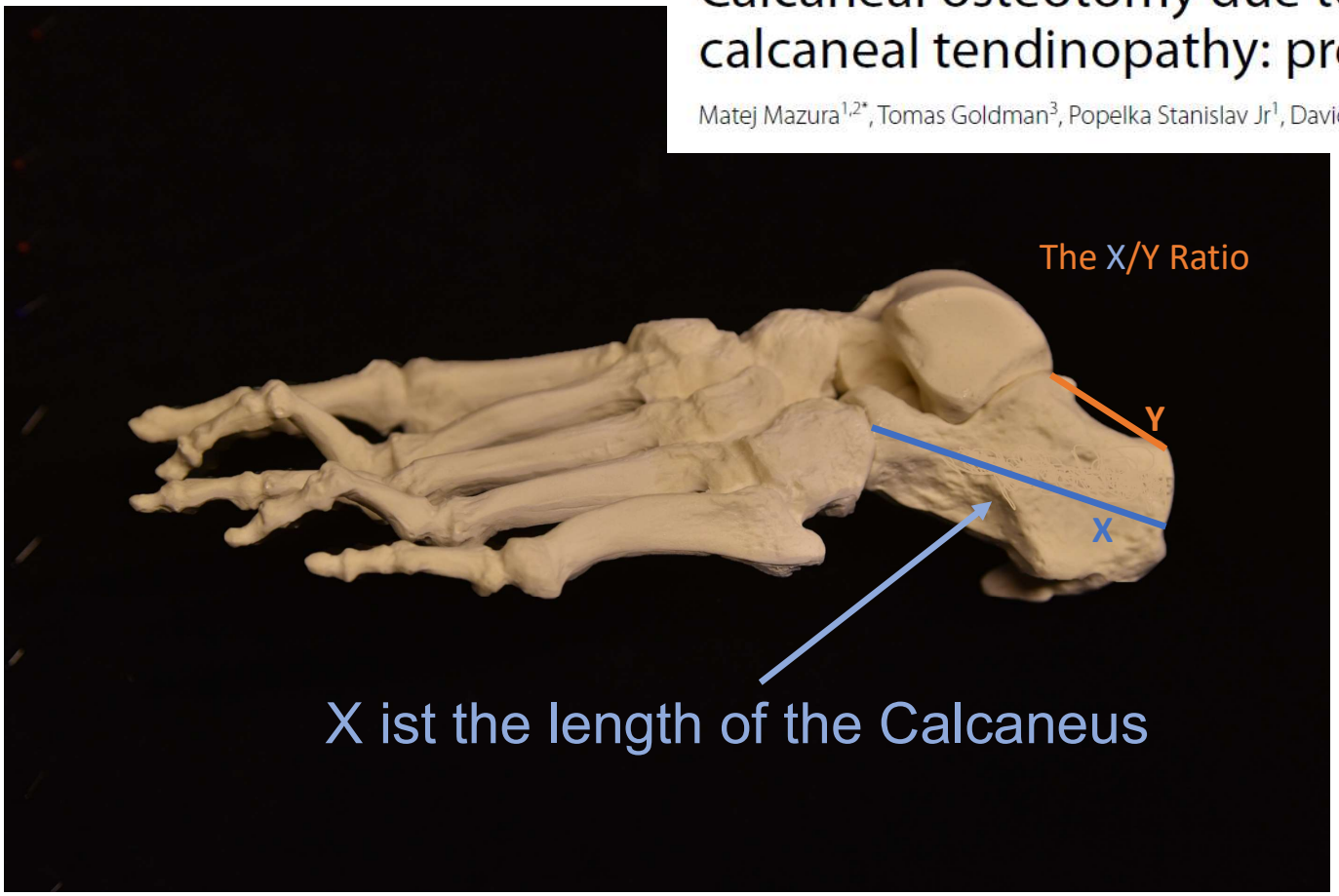

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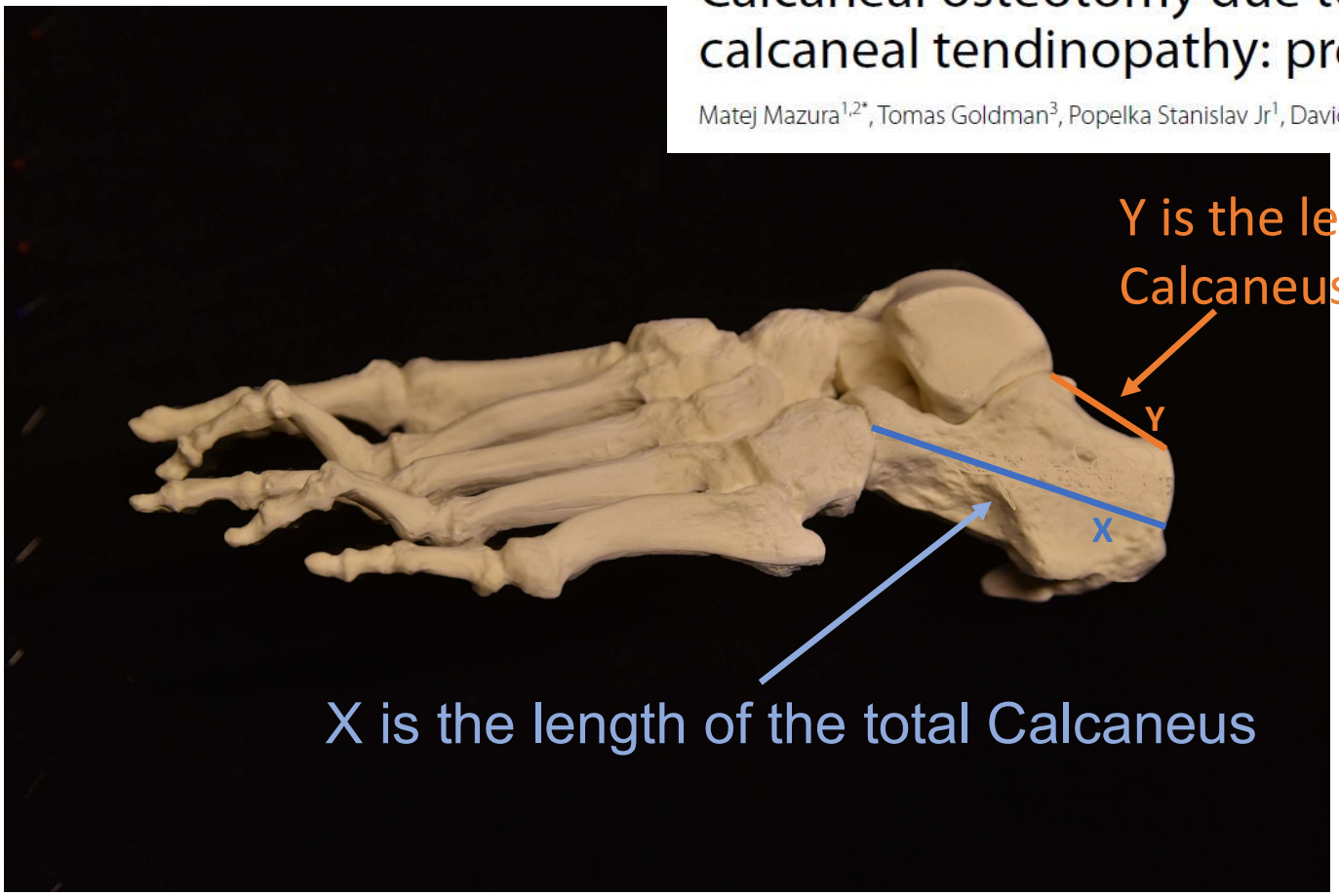
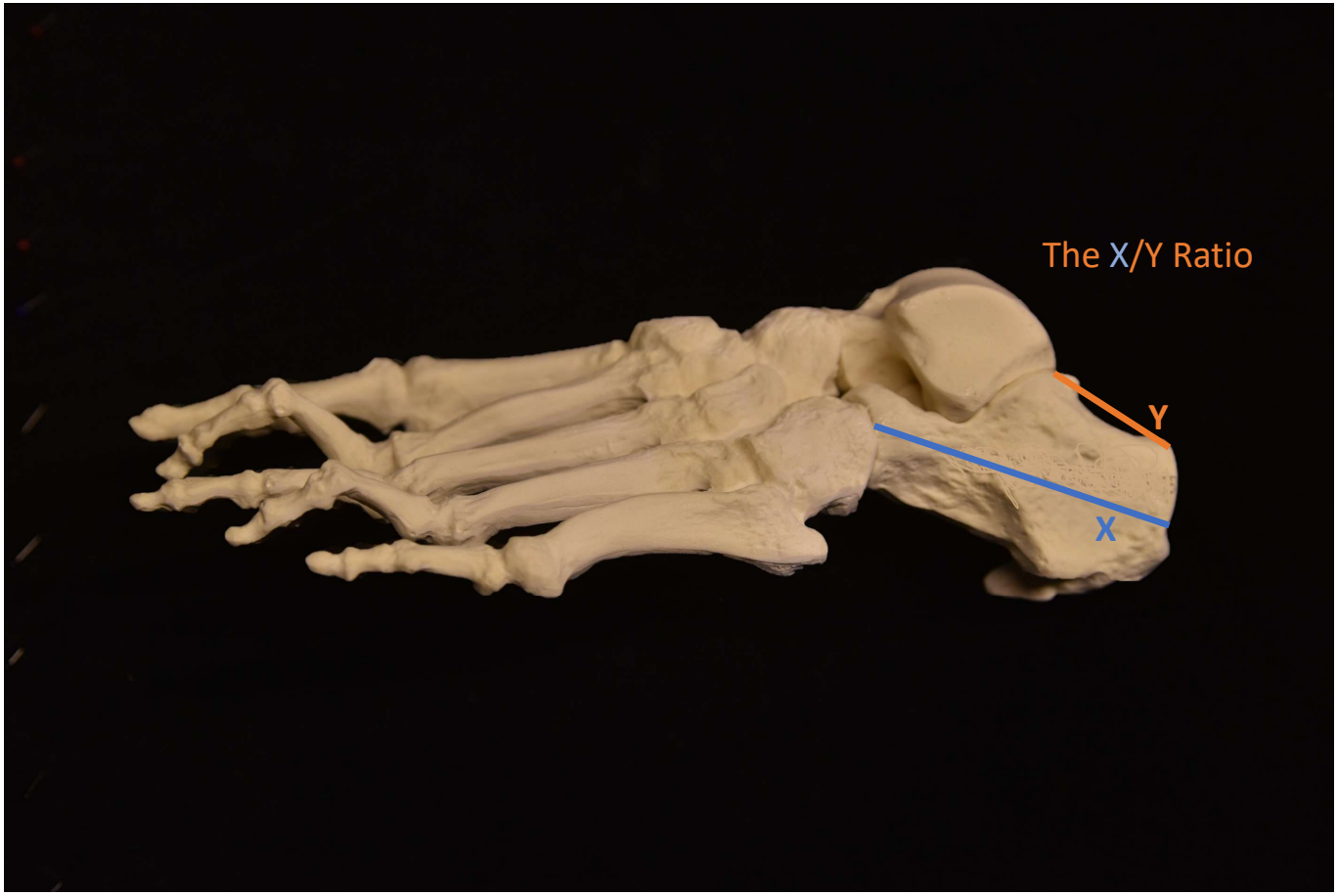


X/Y Ratio < 2.5 and / or pitch angle > 18 degrees → **Zadek osteotomy**

X/Y ratio > 2.5 could lead to an **isolated calcaneoplasty**



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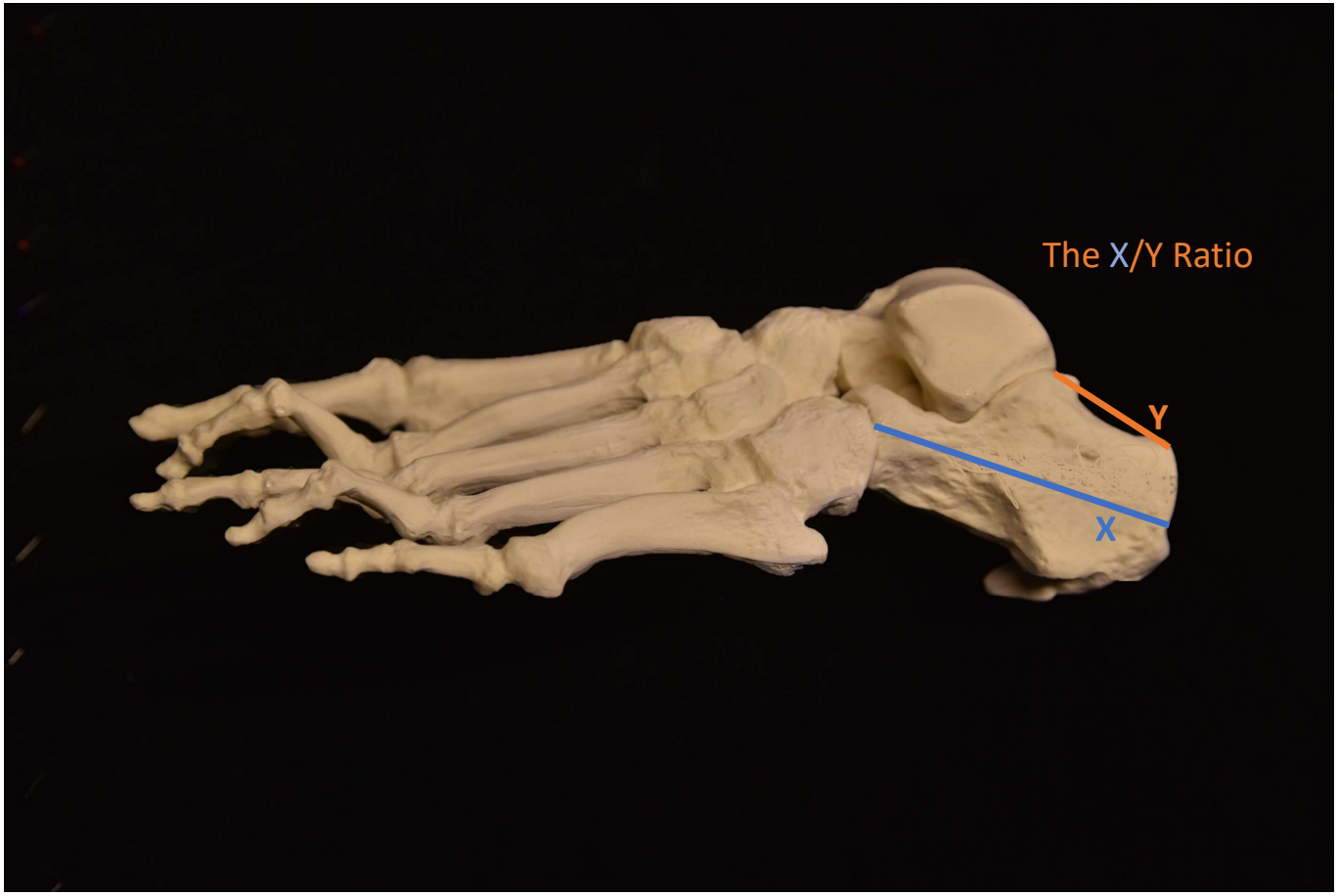
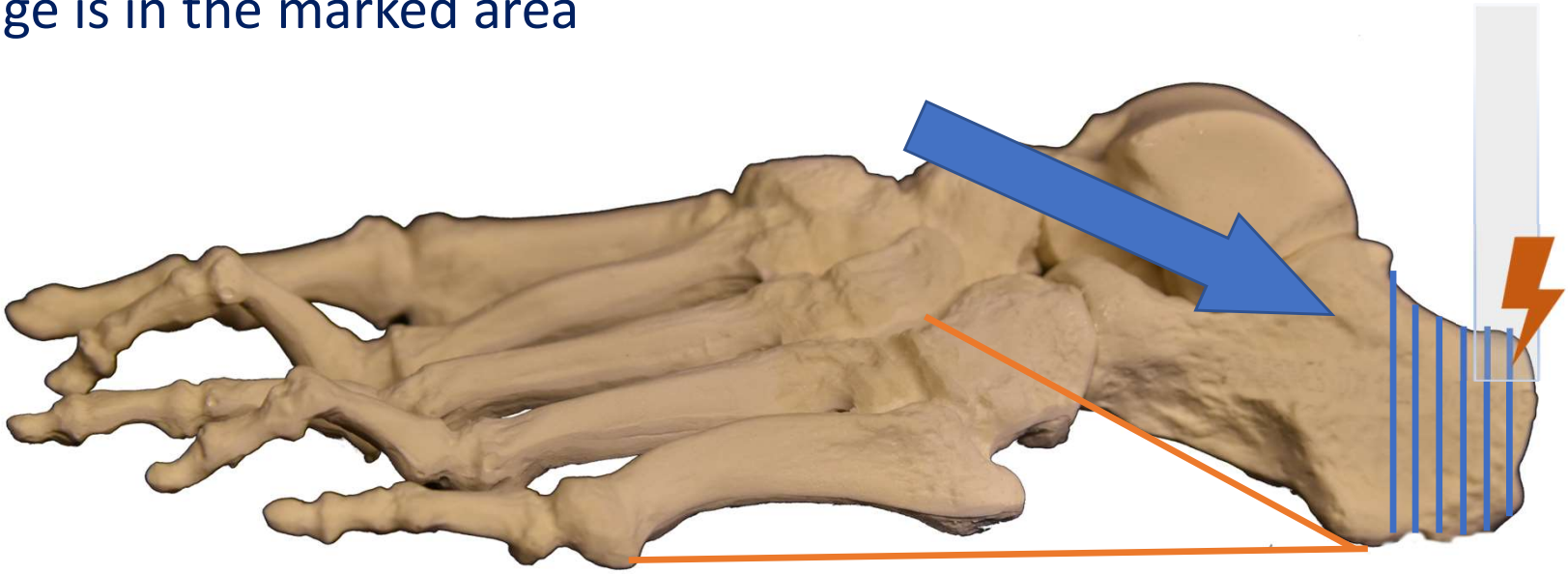


simplified:
the longer the tuber
the more zadek

Calcanear Pitch Normal

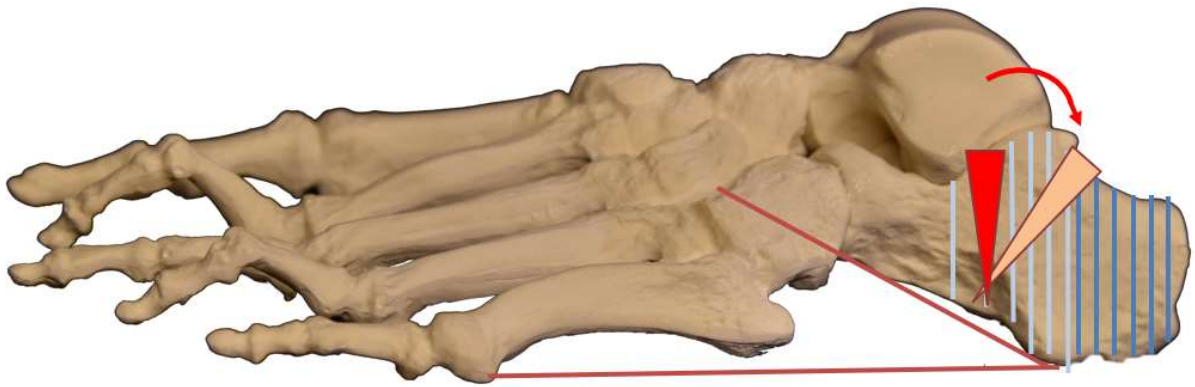
The wedge is in the marked area



THE OSTEOTOMY HAS NO EFECT ON THE CALCANEAL PITCH HERE

Calcaneal Pitch > 20 degrees

The osteotomy lies more distal and more horizontal



The wedge is normally not bigger than 1-2 cm

IAT/ Haglund + calcanear pitch> 20 degrees→ a horizontal Zadek OT

IAT/ Haglund + normal calcanear pitch→ a vertical Keck and Kelly OT

Post operative treatment

Long walker for 4 weeks

1 week no weight bearing

3 weeks full weight bearing in the walker

X-ray after 4 weeks full weight bearing without walker

Return to sports after 3 month

Advantages:

Few wound problems with intact soft tissue mantle

Low level of pain

Rapid convalescence phase

Technology can be learned quickly

No tourniquet necessary

The ventral rotation of the calcaneus tuberosity relieves the Achilles tendon without directly addressing the Achilles tendon

Disadvantages:

The crushed bone can induce inflammation

Higher X-ray radiation than with the open technique

Longer operation time than the open technique

Results are promissing

2019


Foot and Ankle Surgery xxx (2019) xxx–xxx

Contents lists available at ScienceDirect

Foot and Ankle Surgery

journal homepage: www.elsevier.com/locate/fas

Percutaneous Zadek osteotomy for the treatment of insertional Achilles tendinopathy

Andrea Nordio[a,*], Jimmy J. Chan[b], Javier Z. Guzman[b], Rohit Hasija[b], Ettore Vulcano[b,c]

[a] Department of Medical Surgical and Health Sciences of Trieste University, Orthopaedics and Traumatology Unit, Cattinara Hospital-ASUITS, Strada Di Fiume 447, Trieste, Italy
[b] Leni and Peter W. May Department of Orthopaedic Surgery, Icahn School of Medicine at Mount Sinai, 5 E 98th St, 9th Fl, New York, NY, 10029, United States
[c] Foot and Ankle West Hospital Mount Sinai, NY, United States

2020


Rev Esp Cir Ortop Traumatol. 2020;64(1):22–27

SECOT Sociedad Española de Cirugía Ortopédica y Traumatología

Revista Española de Cirugía Ortopédica y Traumatología

www.elsevier.es/rot

ORIGINAL

Osteotomía calcánea con cuña de sustracción dorsal como tratamiento quirúrgico en la tendinopatía insercional de Aquiles

L. López-Capdevila*, A. Santamaria Fumas, A. Dominguez Sevilla, J.M. Rios Ruh, E. Pich Aguilera, N. Boo Gustems, J. Roman Verdasco, J. Gordillo Uribe y M. Sales Perez

Orthopaedic Proceedings Vol. 96-B, No. SUPP2 2018

ZADEK'S CALCANEAL OSTEOTOMY FOR INSERTIONAL ACHILLES PATHOLOGY

N.K. Kelsall,A.W. Chapman A. Sangar et al-

Published Online:21 Feb 2018

Conclusions:
ZO is a safe and effective procedure for the treatment of IAT.

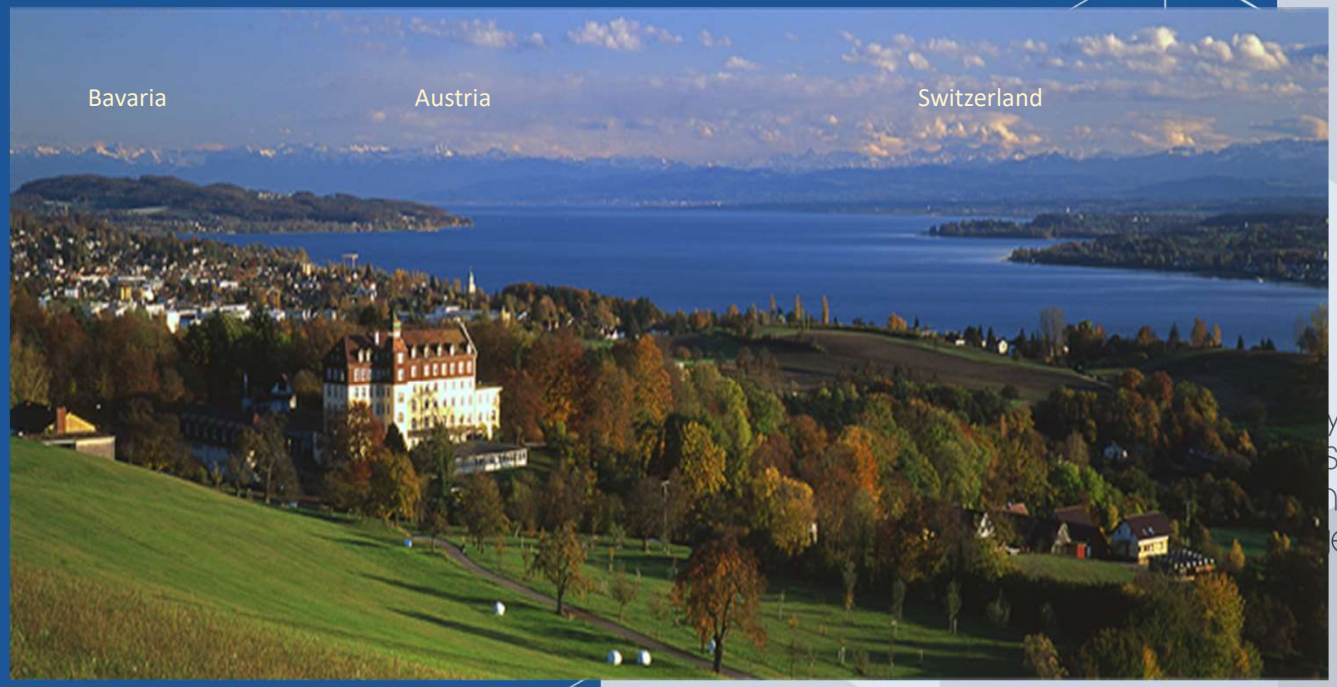
The use of a minimally invasive surgical approach is associated with excellent pain reduction (VAS score) and improved clinical function (FFI score).

When compared to the open surgical approach, the percutaneous ZO may decrease recovery time and postoperative complications.

Hands-On Cadaver Seminar

February 22-24, 2023
Celebration, Florida

THANK YOU



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