SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

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Recognized by UGC saravanampatti (post), Coimbatore-641035.

Department of Biomedical Engineering

Course Name: 19BMB201 –Diagnostic and Therapeutic Equipment

III Year : V Semester

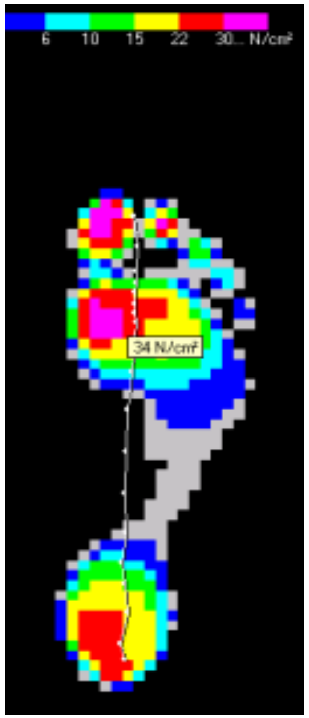
Topic : UNIT 2- PEDOBAROGRAPHY

PEDOBAROGRAPHY

Introduction

- Exam of the posture or the gait not only of the function of the foot and ankle

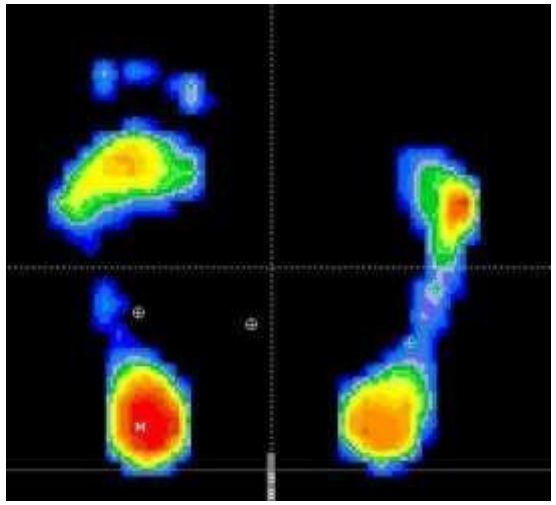
- Always in association with complete clinical examination with gait analysis because of various normal results

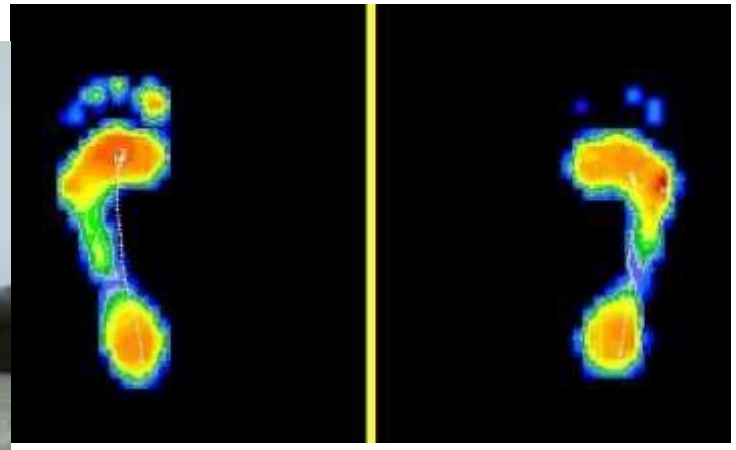


Pedobarography

Static
= posture

Dynamic
= gait





The function of the toes is well analysed in dynamic

Pedobarography

The function of the toes depend of the function of the ankle and the hindfoot

Dynamic analysis is useful in foot and ankle surgery

What's the good procedure in dynamic analysis ?

- Always the same procedure : pre & post op

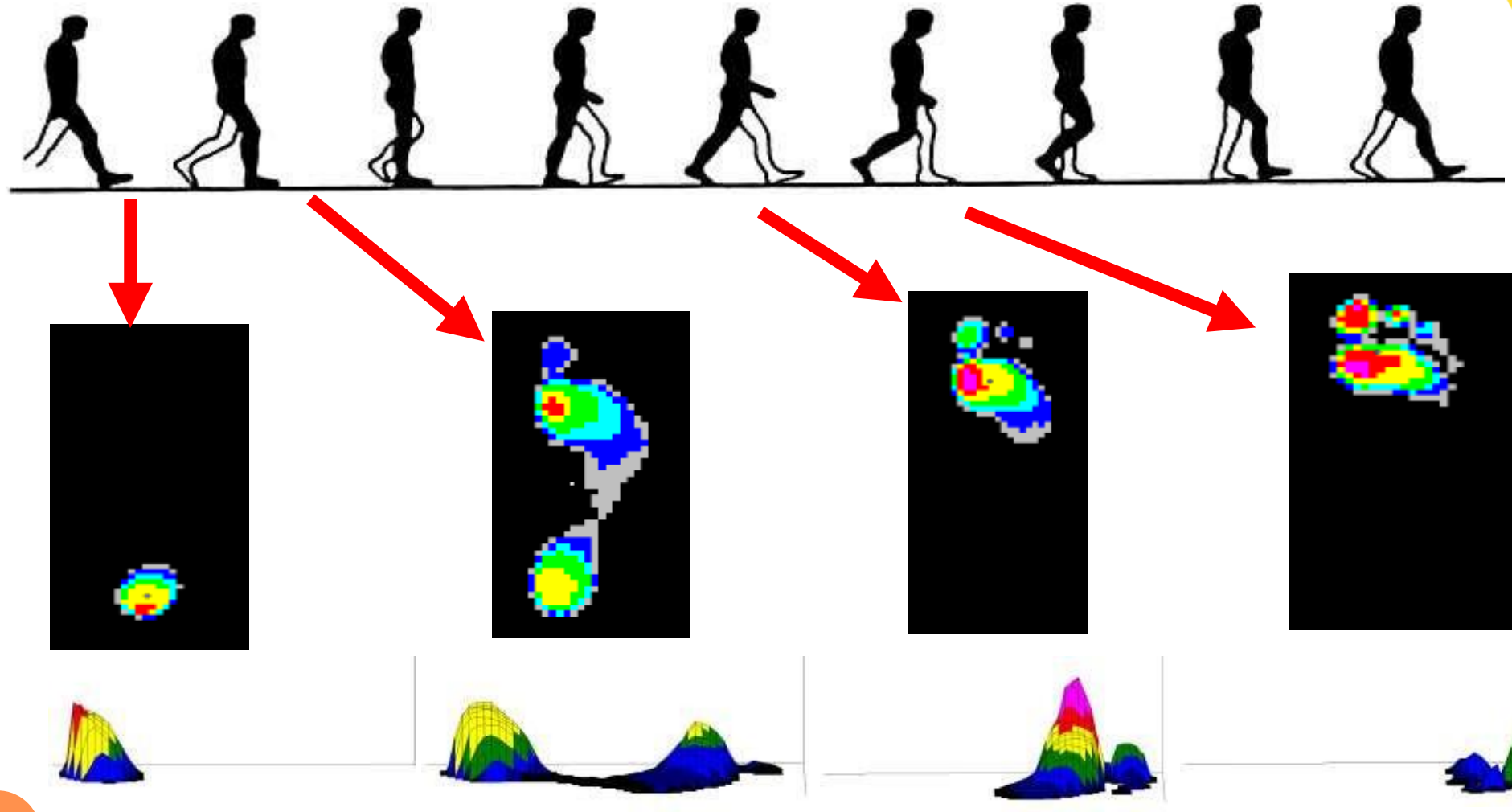
- Same platform
- Same conditions :
  - second steps / several steps
  - only visual good steps
  - at least two trials before recording
  - at least 3 records / foot and always both feet

Sequential Pedobarography

Specific movement on platform to evalue neurologic or functionnal deseases

2 examples of double heel rise test

Dynamic pedobarography : only stance phase



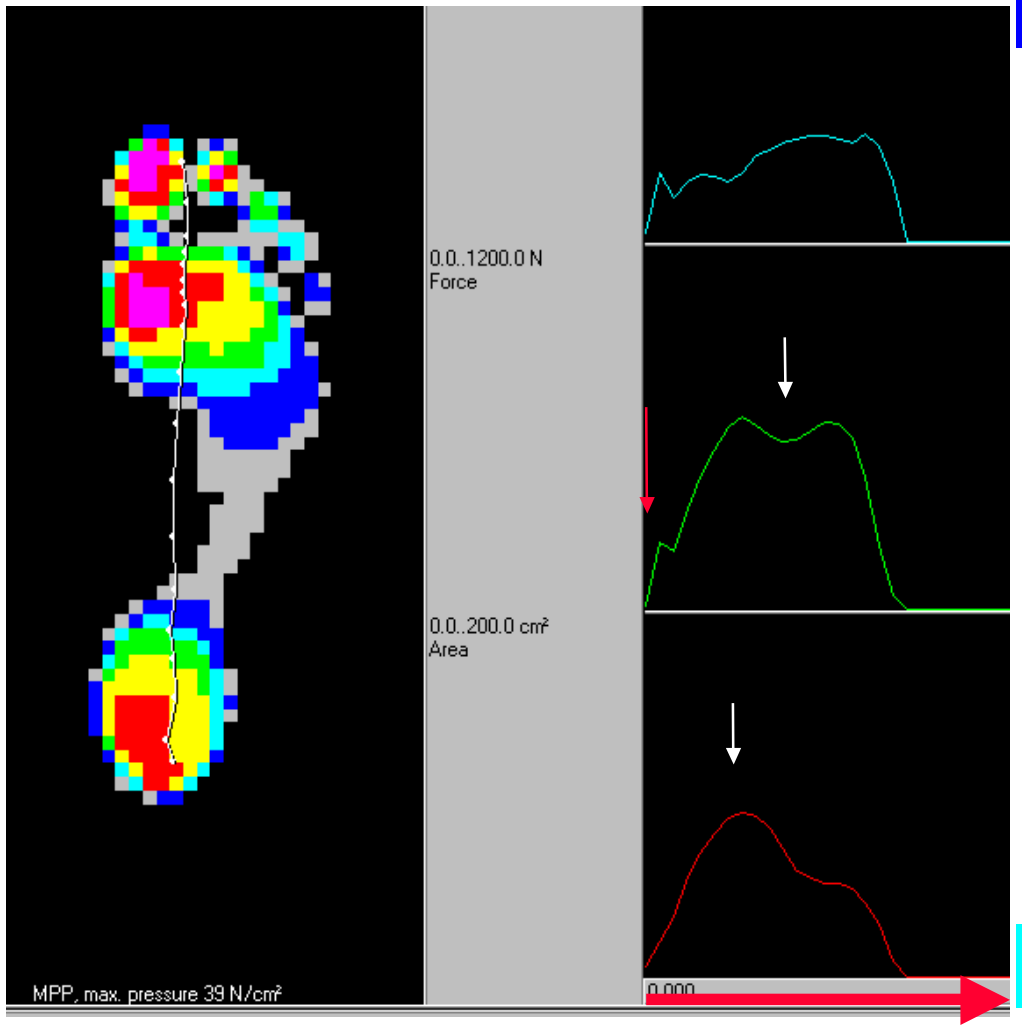
Heel strike
(0 to 15%)

Sole phase
(15 to 40%)

Heel rise
(40 to 50%)

push-off
(50 to 60%)

How to analyse the results?



Print & curves

Maximal pressure

Force

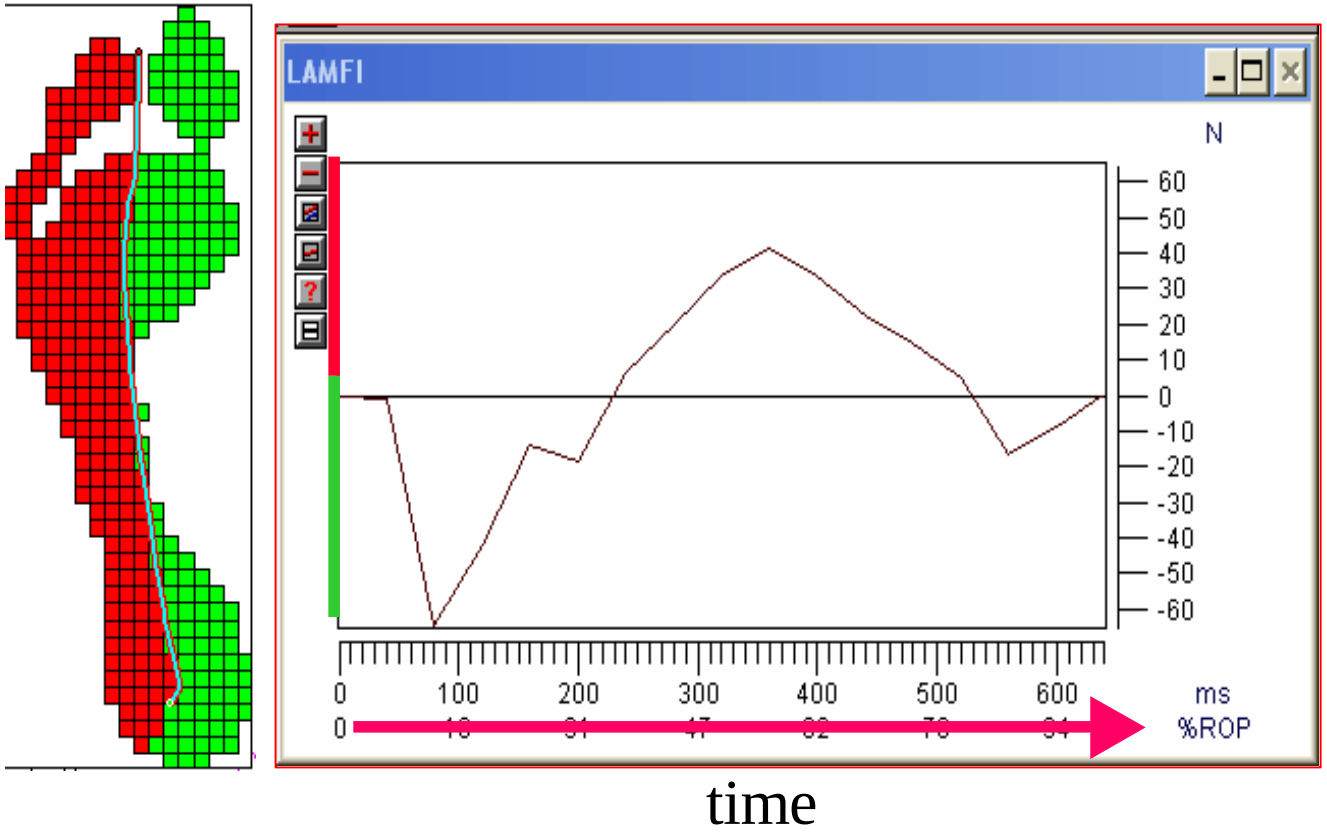
Area

time

How to analyse the results?

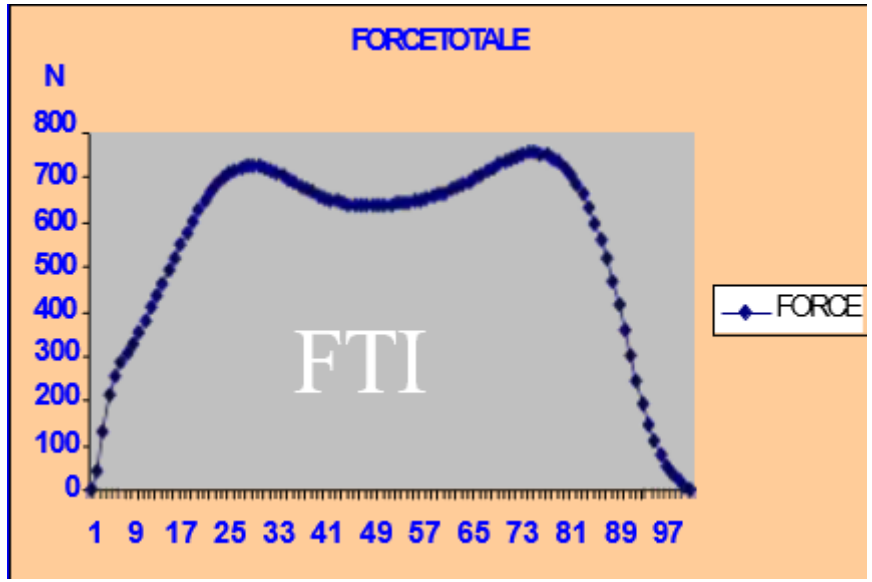
Center of pressure (gait line) and lateromedial force index

Pronosupination during the step

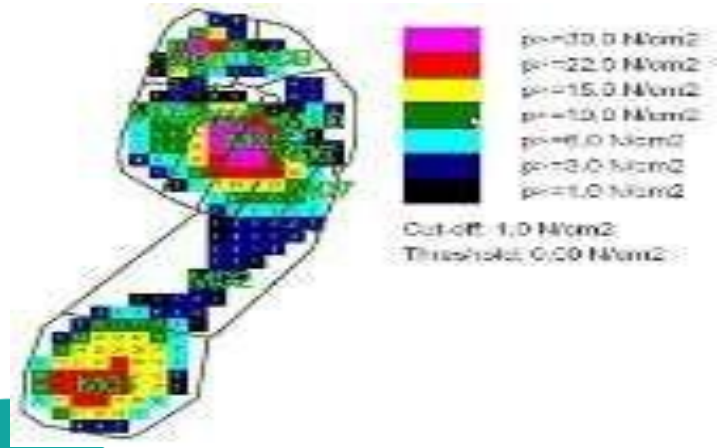


time

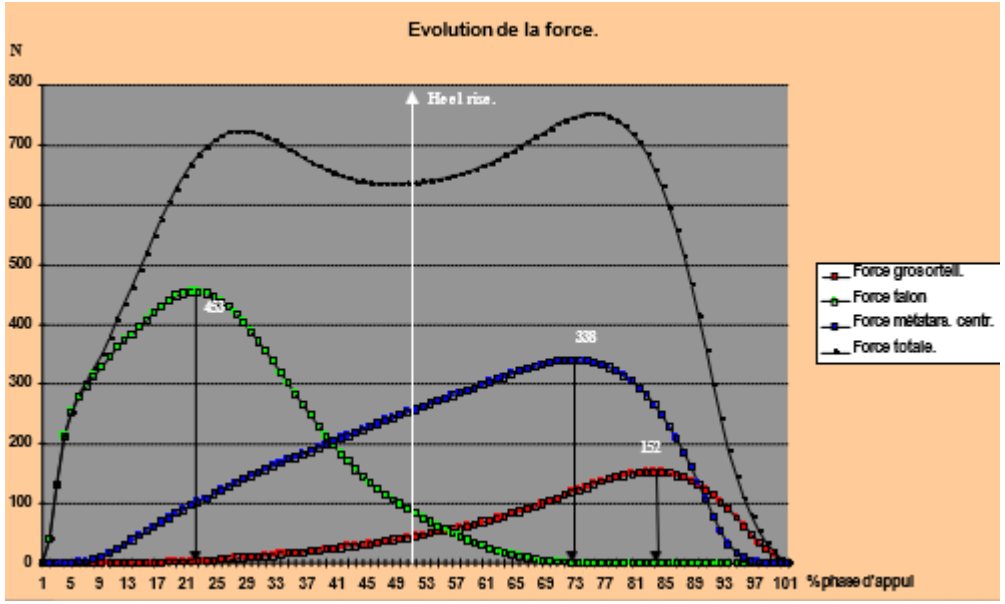
How to analyse the results?



Force time integral (Libotte)



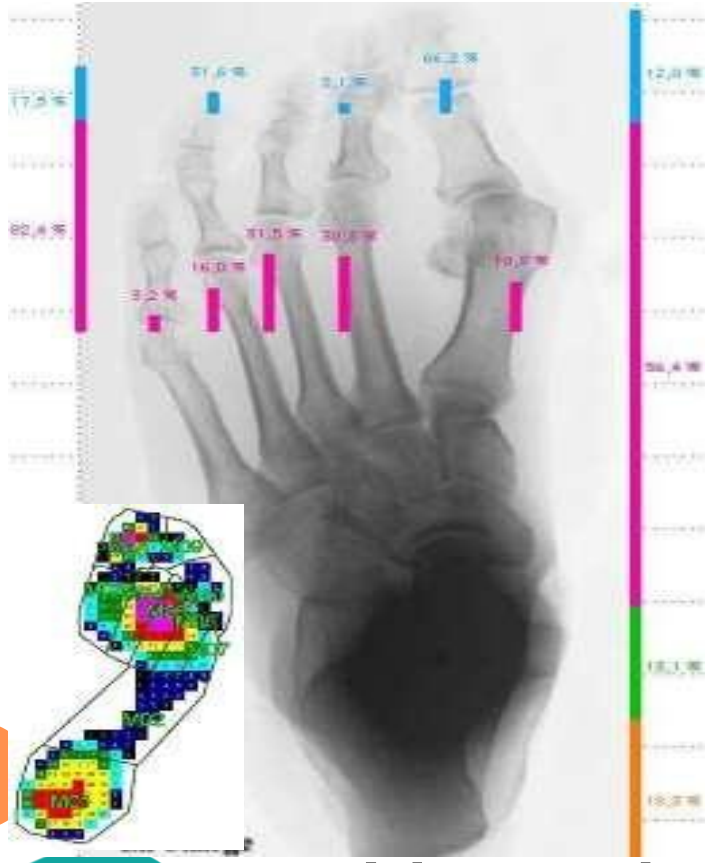
Relative impulse = mask FTI/ total FTI



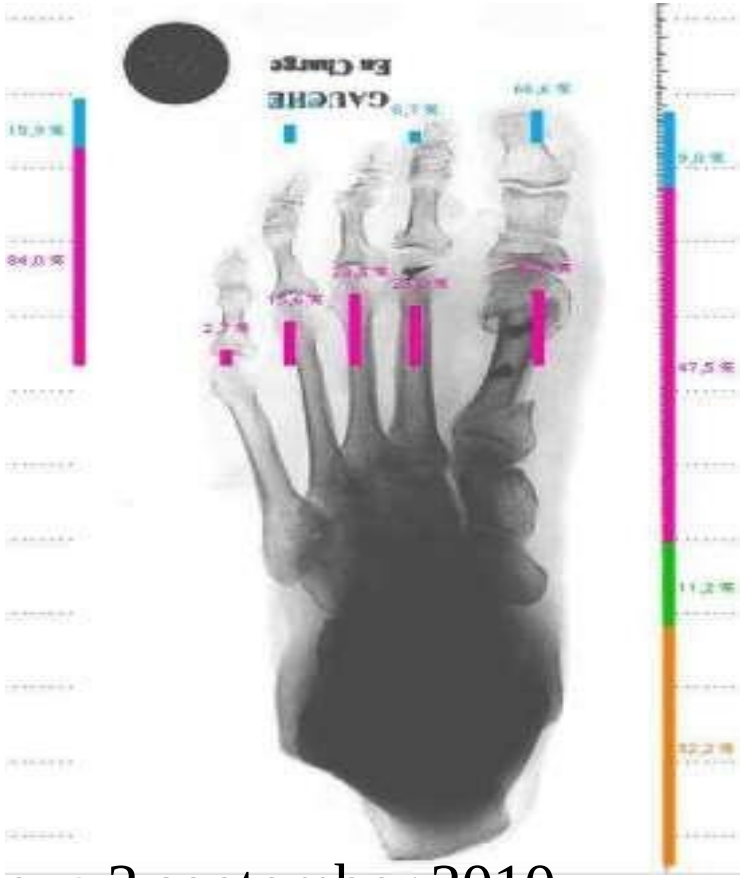
How to analyse the results?

Comparison of force time integral in metatarsal and toe areas in HV surgery (from B Ferré)

preop



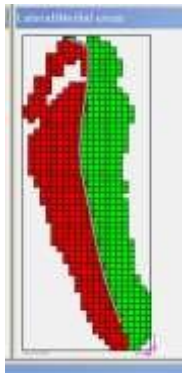
postop

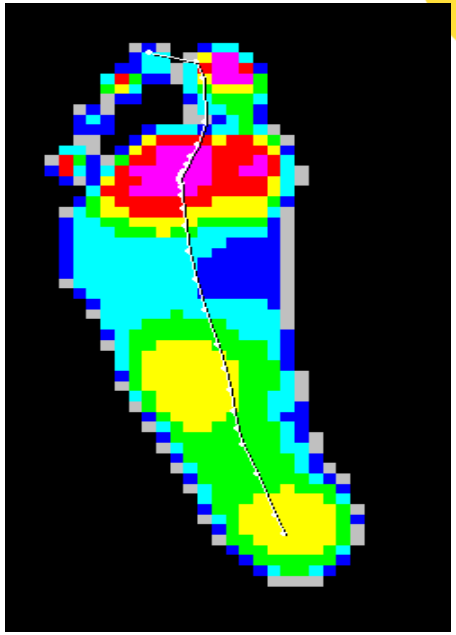


Pedobarography – EFAS – Geneva 2 september 2010

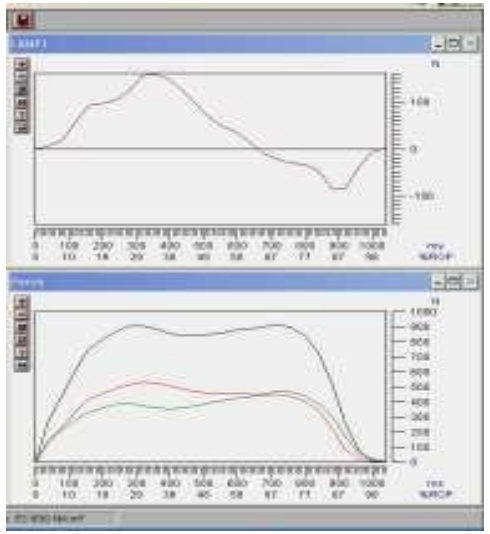
Indications: To Understand The Disease

Flatfoot varus in Muller Weiss desease



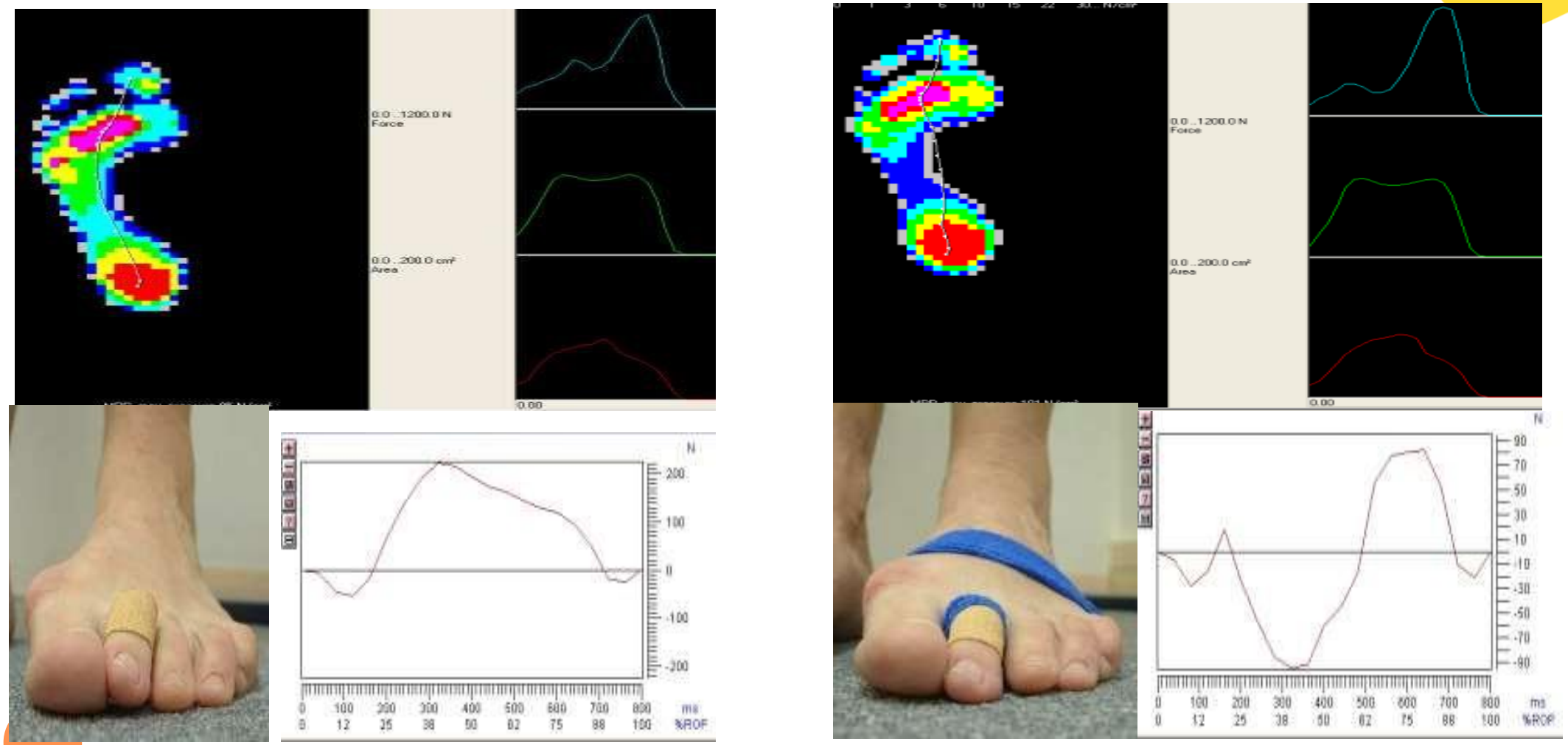


Posterior view: hindfoot well axed
But specific dynamic pedobarography



Indications: To Understand Medical Treatment

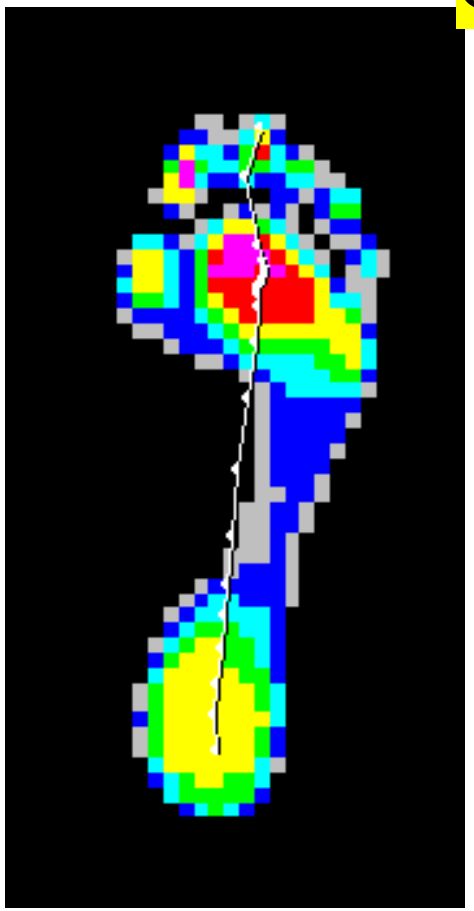
Strapping in 2nd ray syndrom



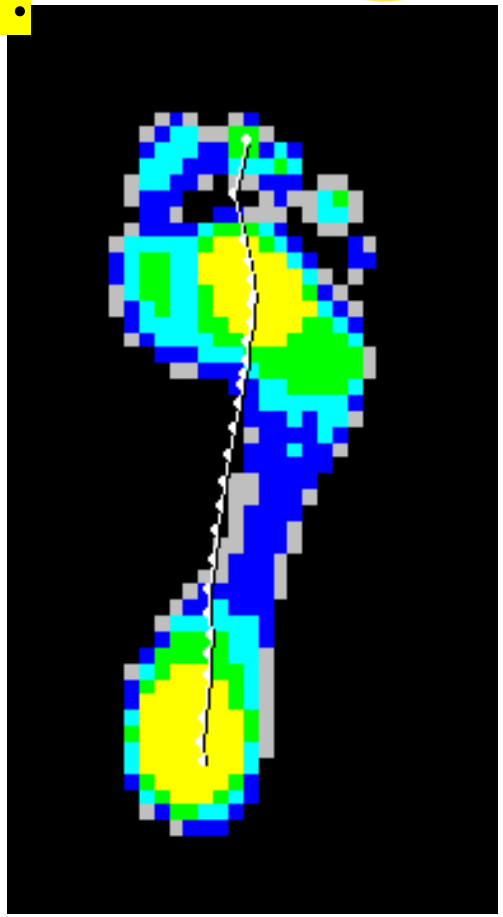
Pedobarography – EFAS – Geneva 2 september 2010

Indications: Evaluation Of the Surgery

Comparison of pre/postop print :



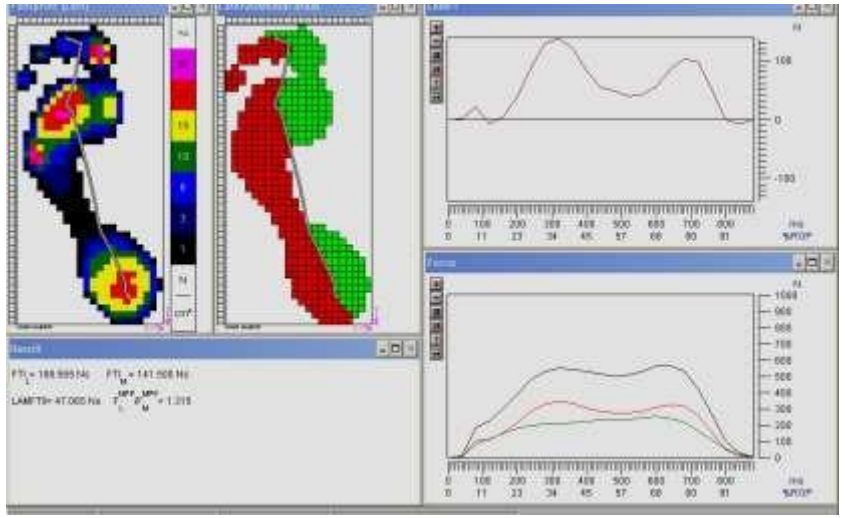
HV surgery : scarf osteotomy



Pedobarography – EFAS – Geneva 2 september 2010

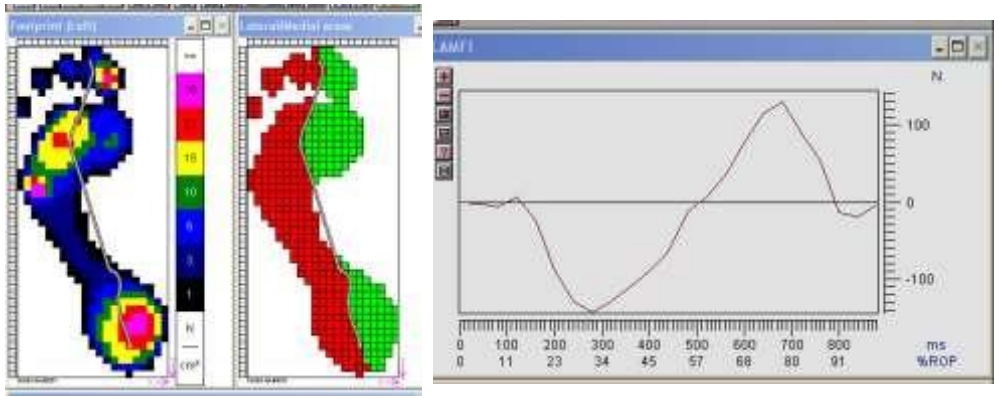
Indications: Evaluation Of the Surgery

Ankle instability without laxity in 16 YO woman…because gastrocnemius retraction



Dynamic hindfoot varus
= MTP5 overpressure
= LMFI : lateral force

After, medial gastrocnemius release and win of 30° ankle dorsal flexion



Valgus
of the hindfoot
6 months post op

Indications: Evaluation Of the Surgical Result

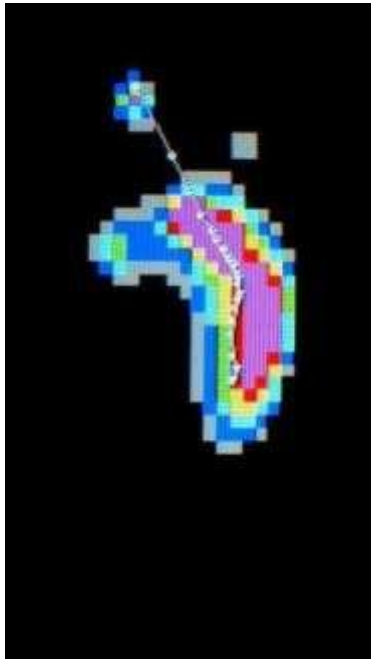


Equinus varus cavus foot (lodge syndrom)

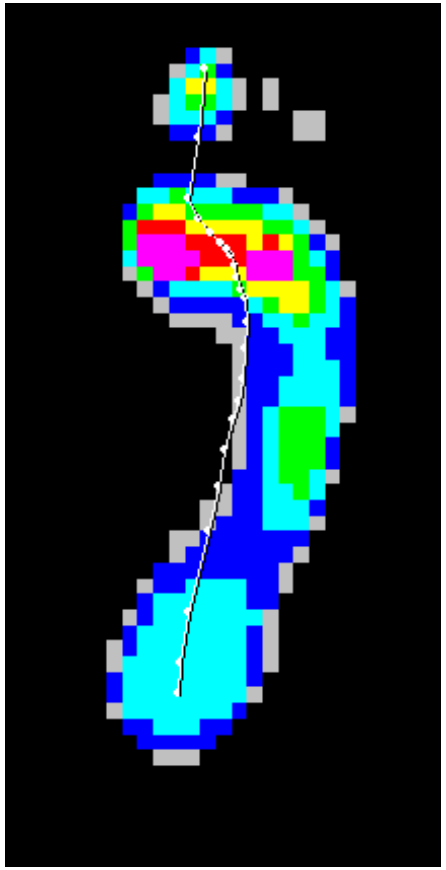


Result after conservative surgical treatment

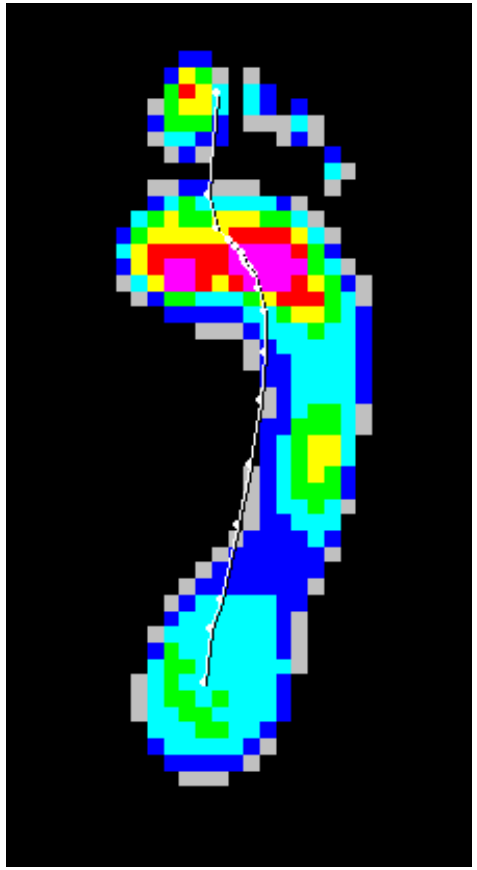
Dynamic Pedobarography evolution on 7 Years



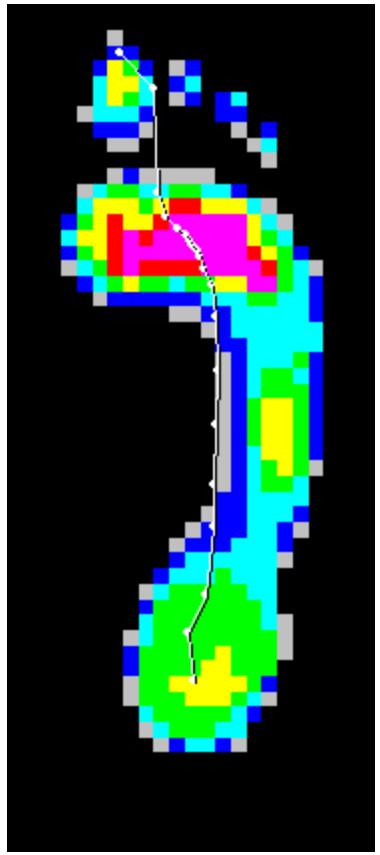
preoperative



12 months



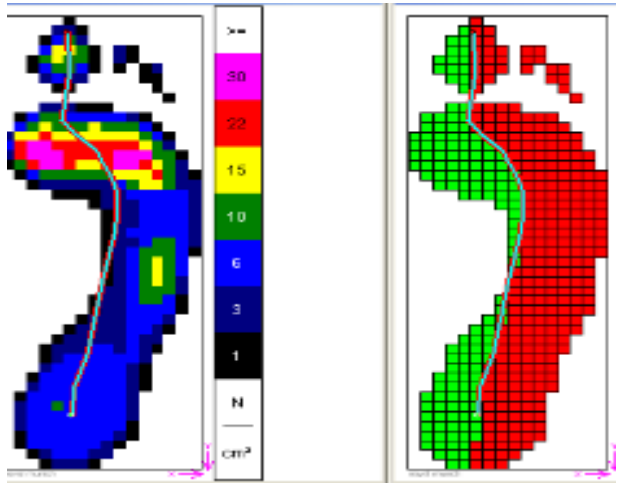
3 years

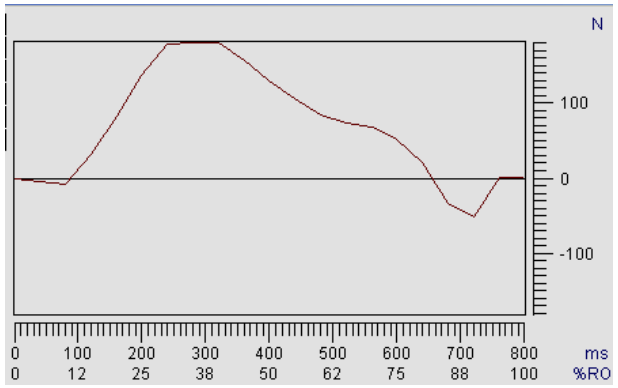


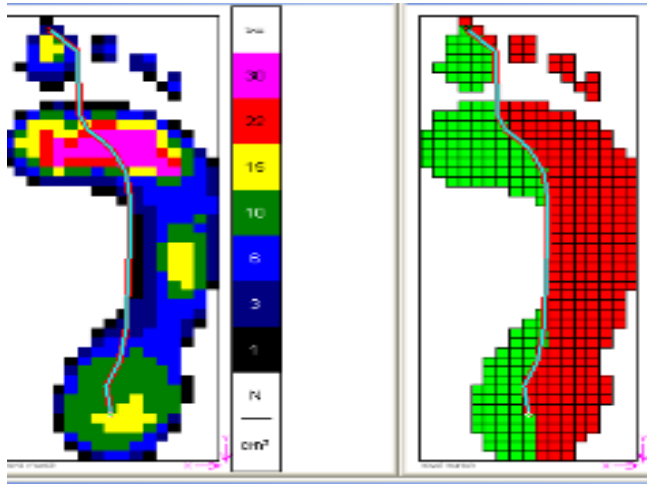
7 years

Lateromedical Force Index (LMFI)

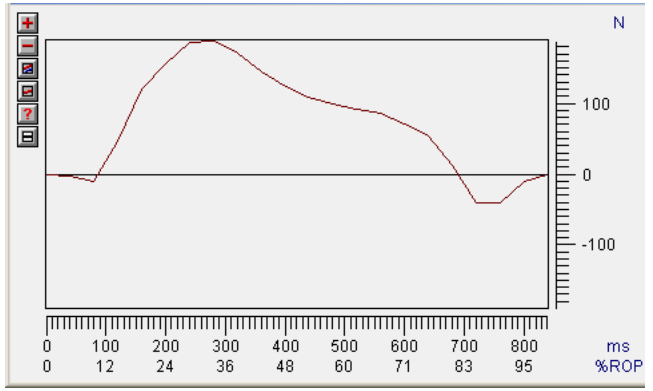
1year







7 years

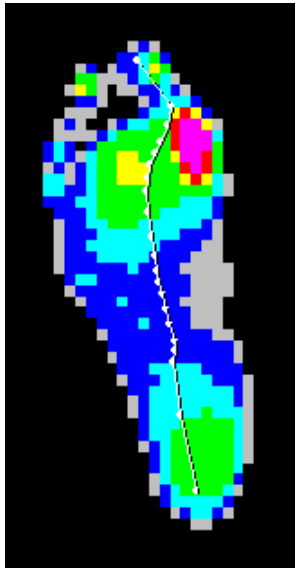


In spite of print evolution , no LMFI evolution

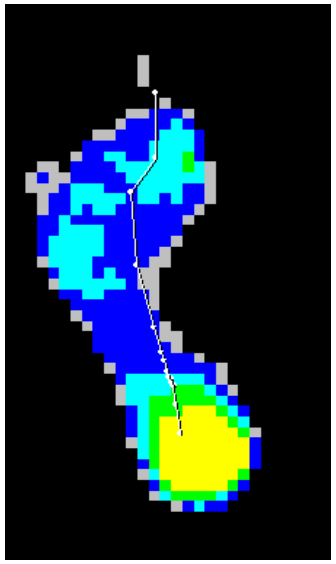
Woman 65 YO Flatfoot with PTT rupture

Treatment:

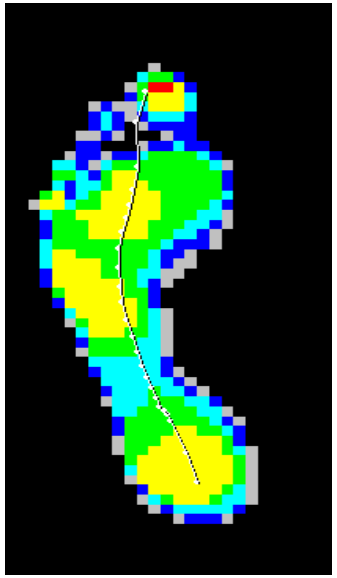
Evans & scarf without PTT surgery



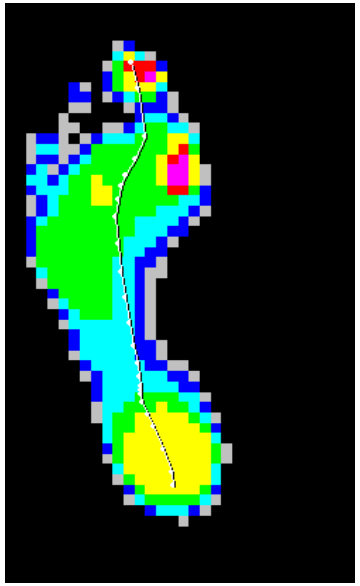
preop



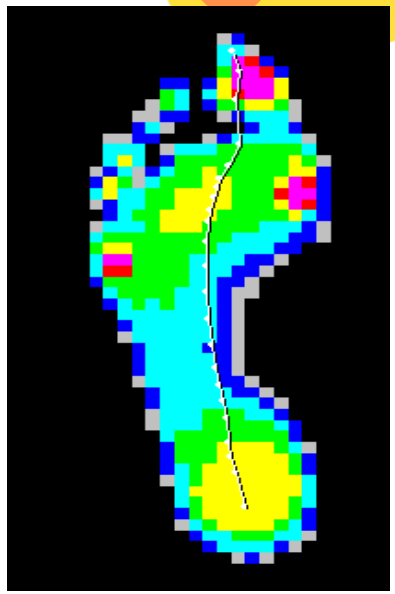
8 months :



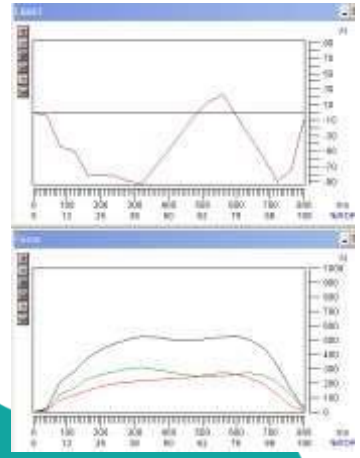
2 years



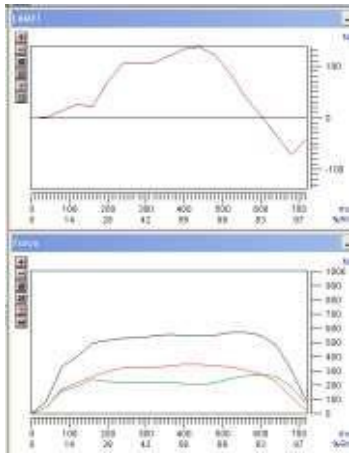
4 years :
Stop insole

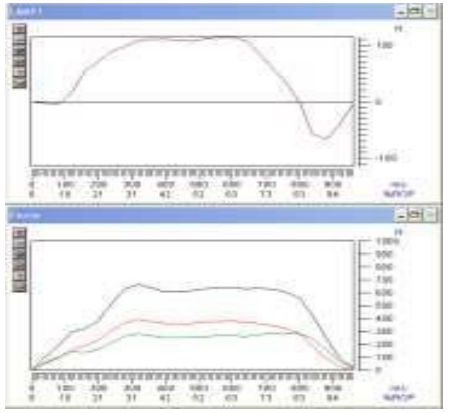


6 years

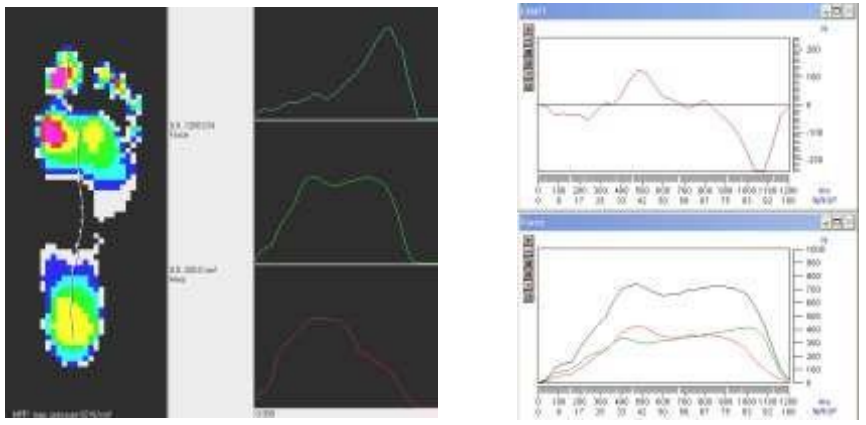


No toes
ground contact
2nd metatarsal
stress fracture
at 1 year

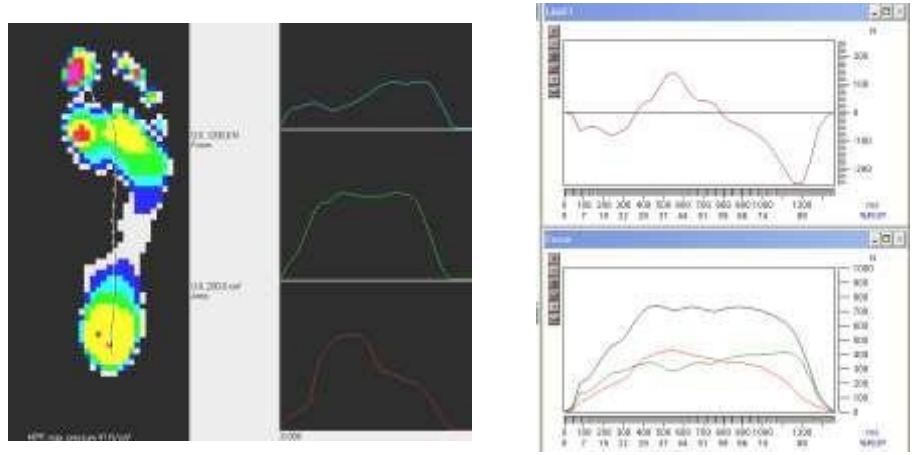




Is a bad result well Analysed?



Before surgery



After surgery

Compression of graft = little correction
LMFI = no change

But , sometimes normal LMFI curve but bad result
= good shape and function in spite of painful foot (non healing, …)

Conclusion

Dynamic Pedobarography is an objective exam
of the function of the foot and ankle but also of the lower limb

The interests for the surgeon of the foot and ankle :

-To understand the function

-To evalue a medical treatment / insole , strapping , physiotherapy before or after surgery

-To evalue the surgical result in short or long follow up

-To compare different surgical procedure