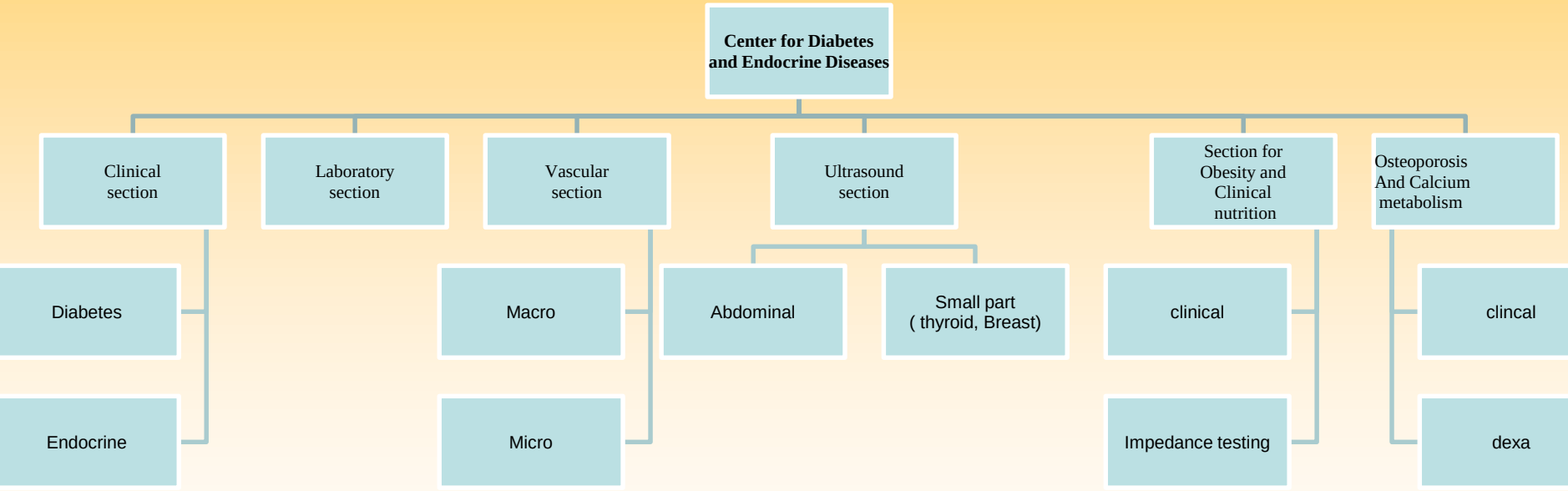
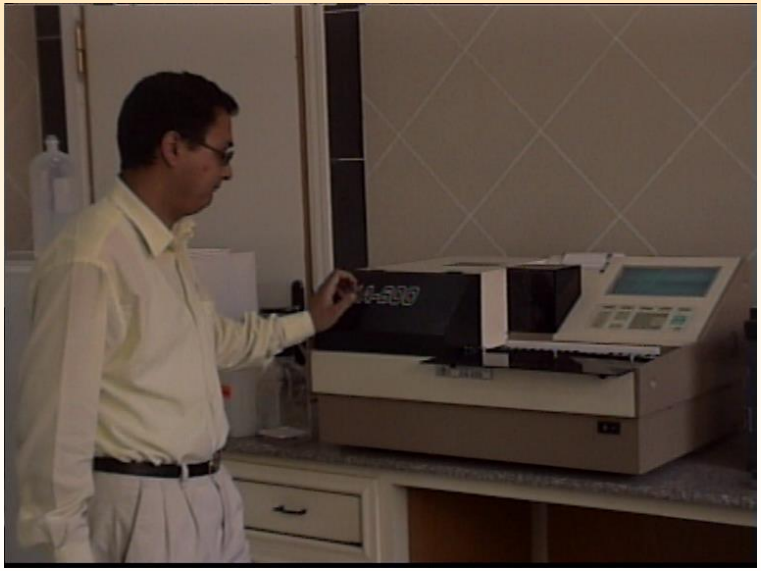
Study of the Diabetic ulcer

Vascular Medicine group
Diabetes clinic
Cairo University Hospital

Dina Shaheen and Aly El Ashmaui

Cairo University Center for Diabetes and Endocrine diseases





Diabetic foot

Pathogenesis

Large vessel disease

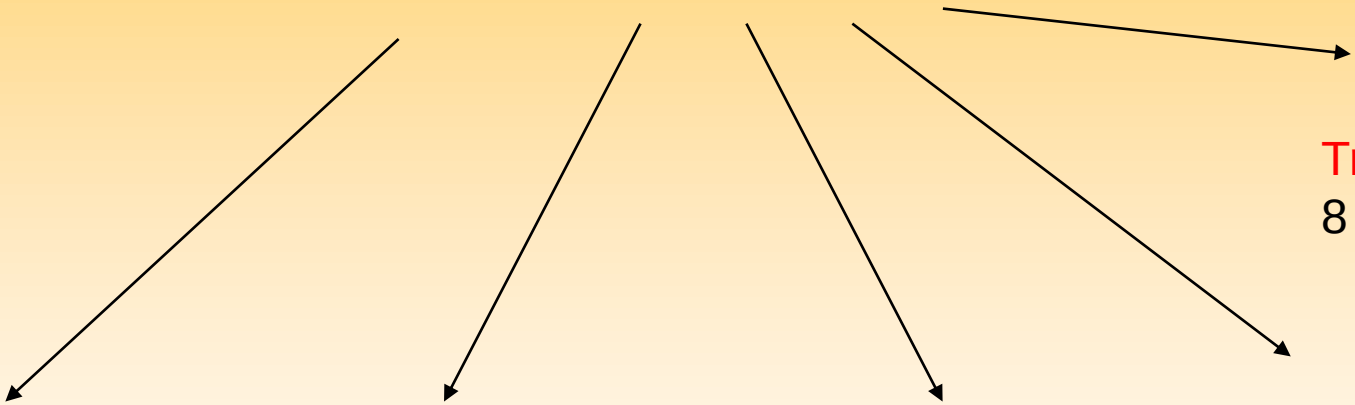
Small vessel disease
- Digital
- Capillaries

Infection

Neuropathy

Vascular Medicine group
Diabetes clinic
Cairo University Hospital

Microcirculatory evaluation of Ulcers



Diabetic
37 cases

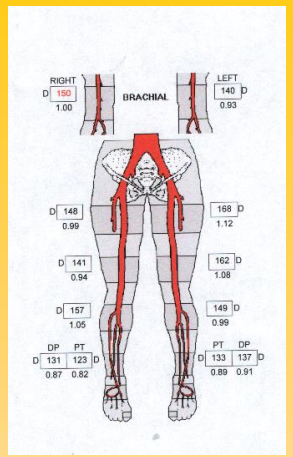
Venous
16 cases

Ischemic
12 cases)

Collagen disease
6 cases)

Traumatic
8 cases)

Adopted Protocol



Clinical evaluation

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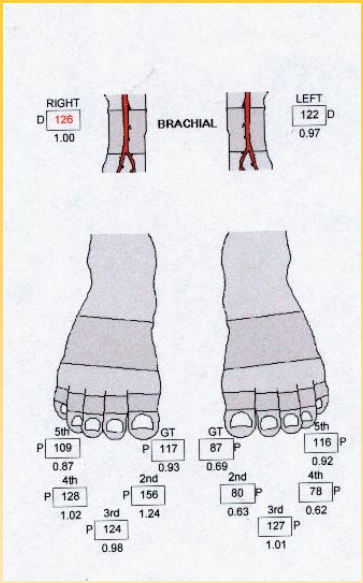
Ankle Brachial indices
Segmental pressure study
Colored Duplex evaluation



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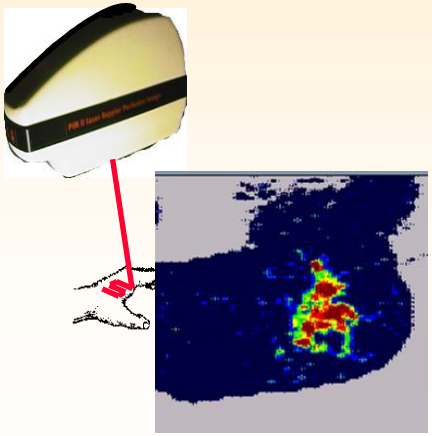
Digital plethysmography

Laser Doppler scanning

Transcutaneous O2

Nerve conduction



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Follow up by same procedures
Whenever possible

Exclusion criteria for Diabetic ulcers

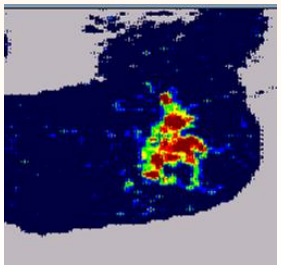
1- Large vessel disease

2- Digital artery disease

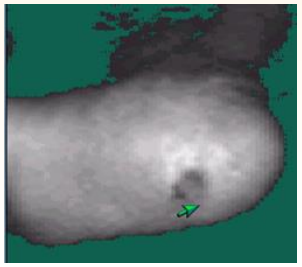
Phase one of the study

Evaluation of the characteristics of Diabetic ulcers

The capillary Flow at the base Of the ulcer

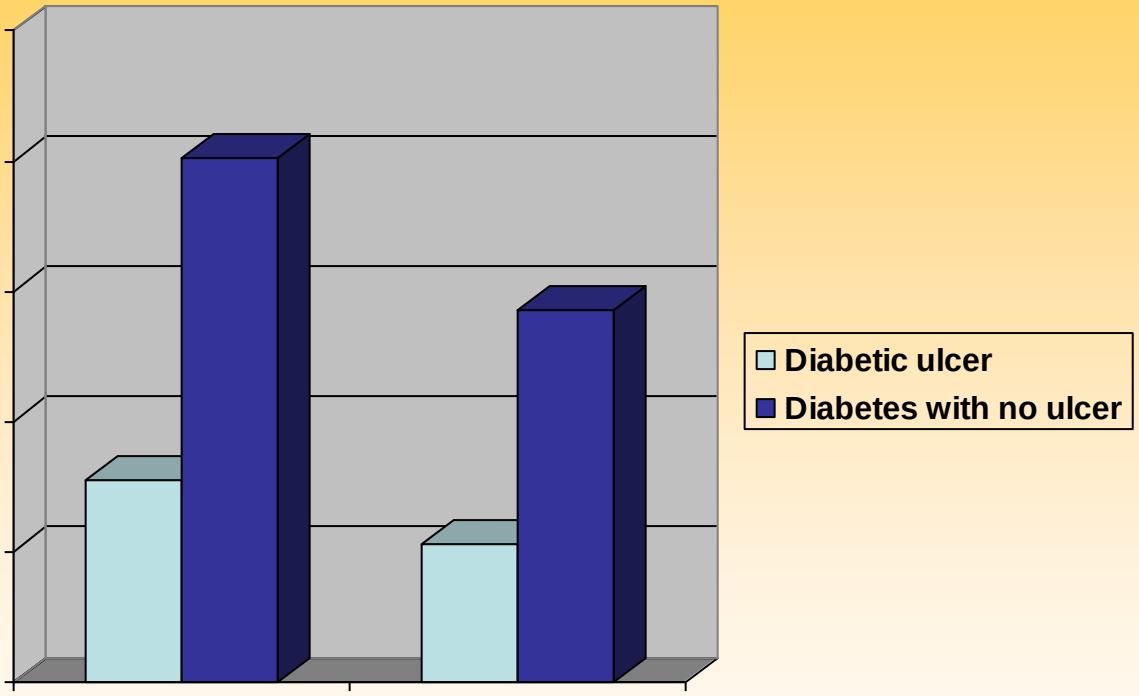


The oxygenation of the skin At the edge of the ulcer



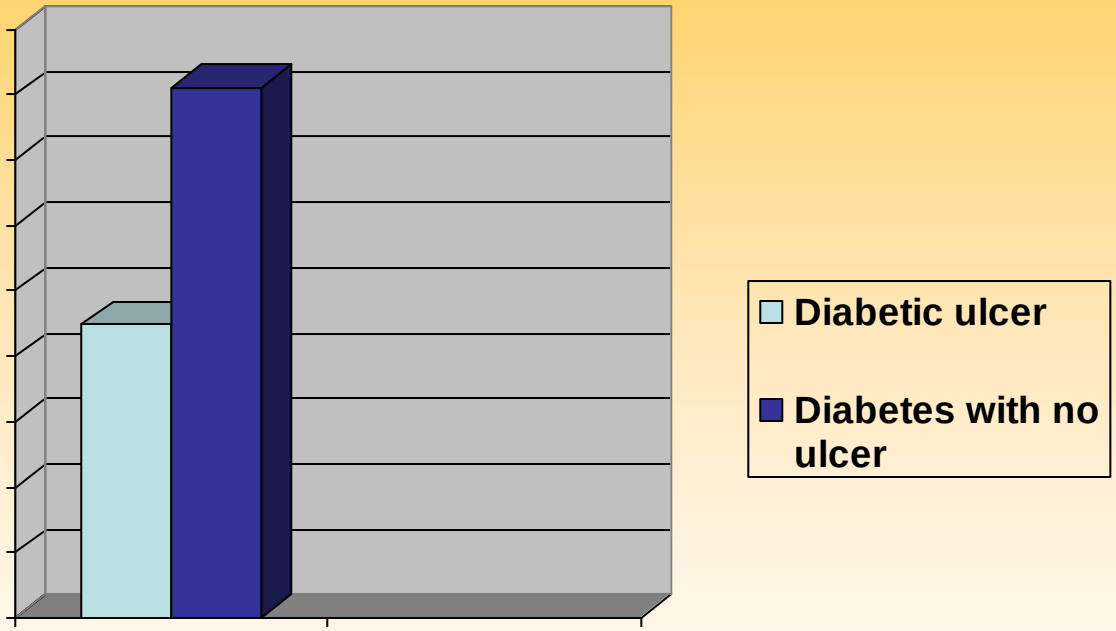
The capillary flow At the edge of the ulcer

Laser Doppler flowmetry in Diabetic patients with and without ulcer



P = 0.006

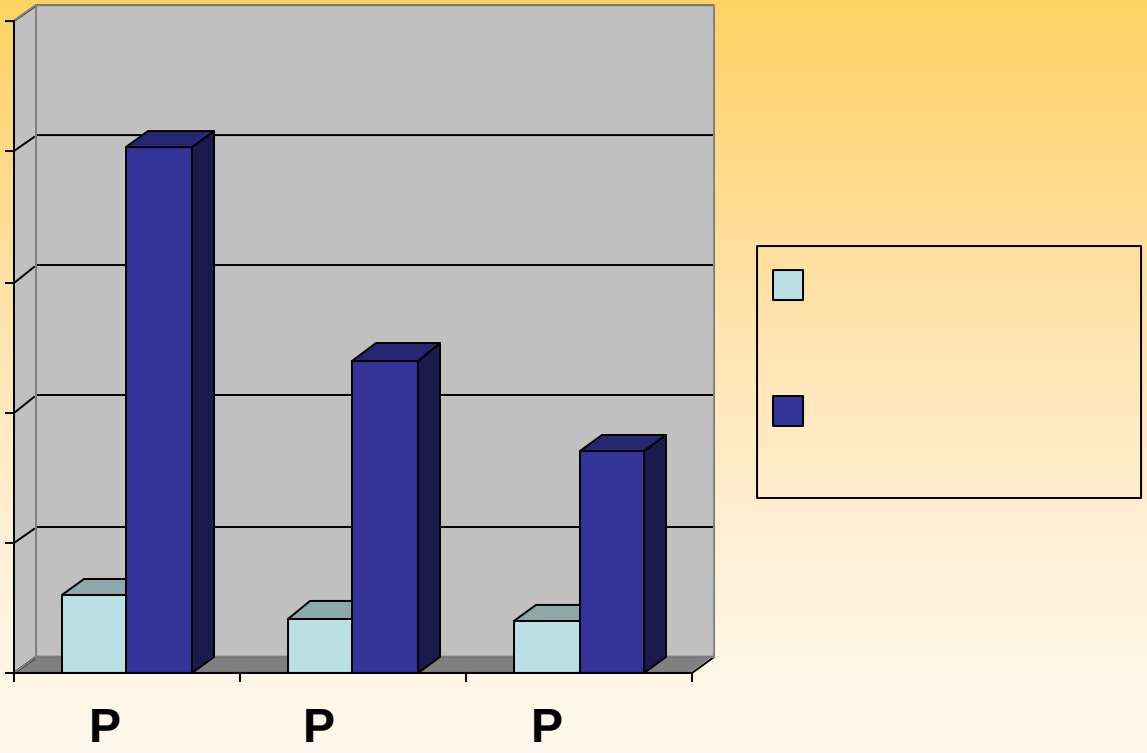
Transcutaneous O2 in Diabetic with and without ulcers



O

P = 0.02

The Power of Vasomotion in diabetic With and without ulcers



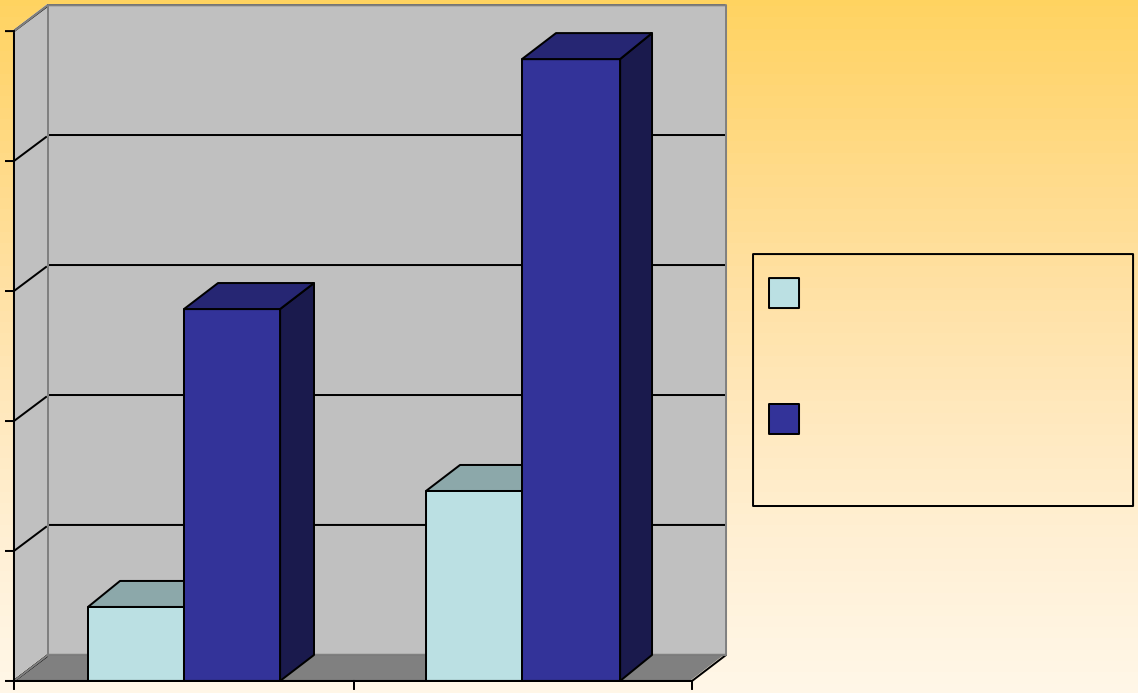
P Value P5= 0.04
P10= 0.01
P 15 = 0.001

Correlation with Laboratory Data

No Correlation was found between Capillary flow or transcutaneous O2 On one hand and

1- Fasting Blood Sugar
2- Postprandial Blood Sugar
3- Blood Urea
4- Blood creatinine
5- Hemoglobin level
6- Duration of diabetes
7- Systolic blood pressure
8- Diastolic blood pressure

Laser Doppler flowmetry in diabetic ulcers
With and without smoking



P Value 0.04

In conclusion

Patients with diabetic ulcers have:

1- lower skin perfusion
2- Lower Transcutaneous O2

Compared with diabetic with no ulcers

These changes were not related to:

1- Level of blood sugar
2- Level of blood pressure
3- Level of hemoglobin
4- Renal function
5- Duration of Diabetes

Phase two of the study

Follow up of some cases to determine prognostic criteria


2006 3 21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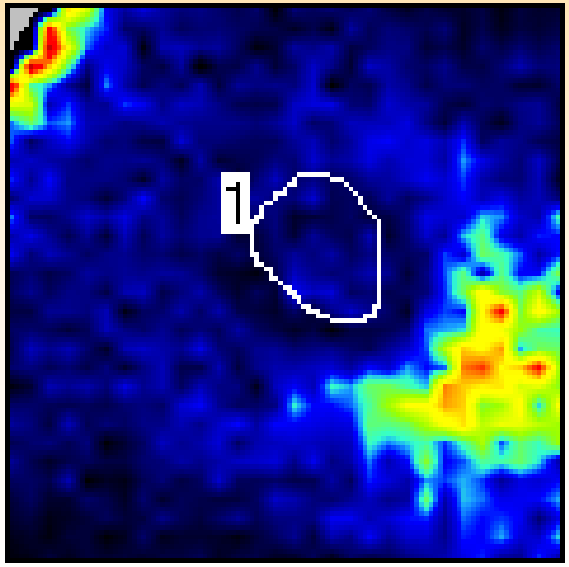
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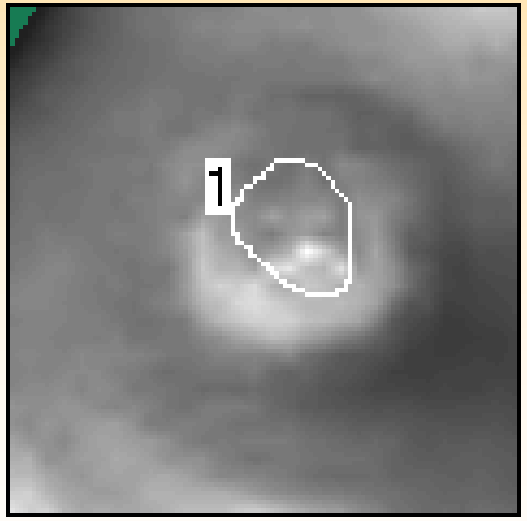
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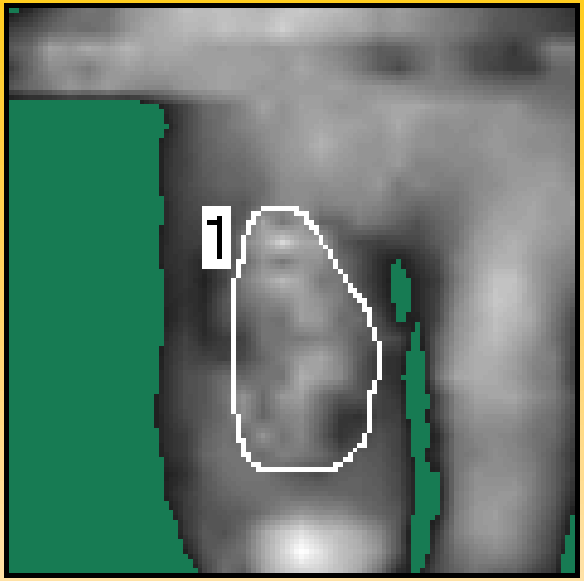
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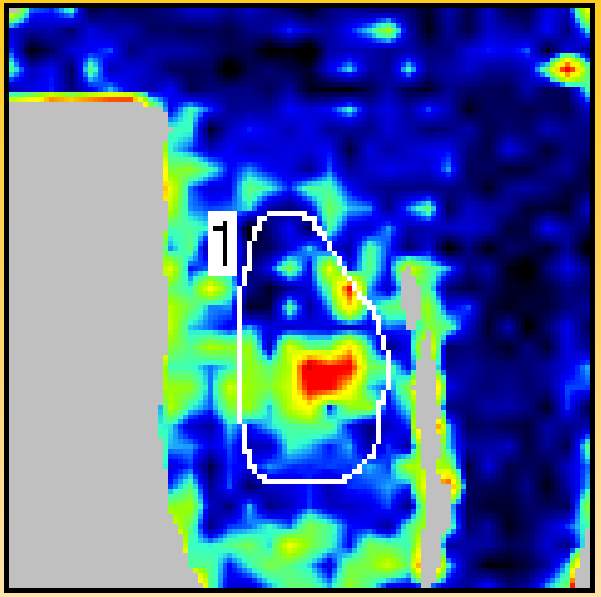
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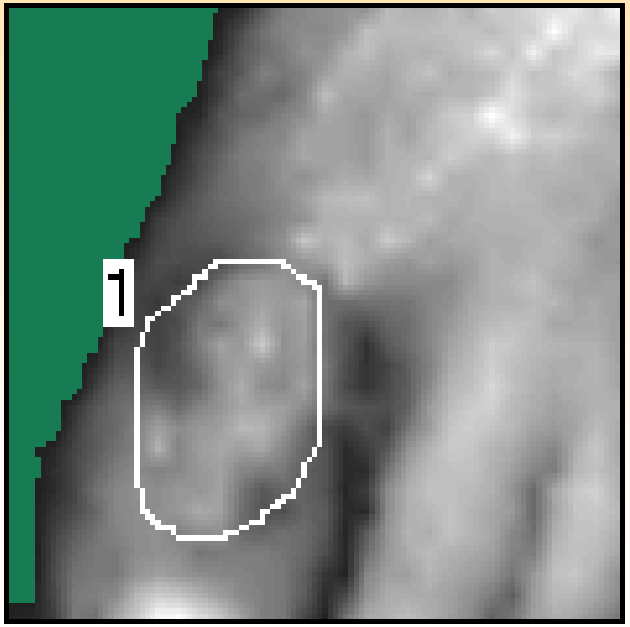
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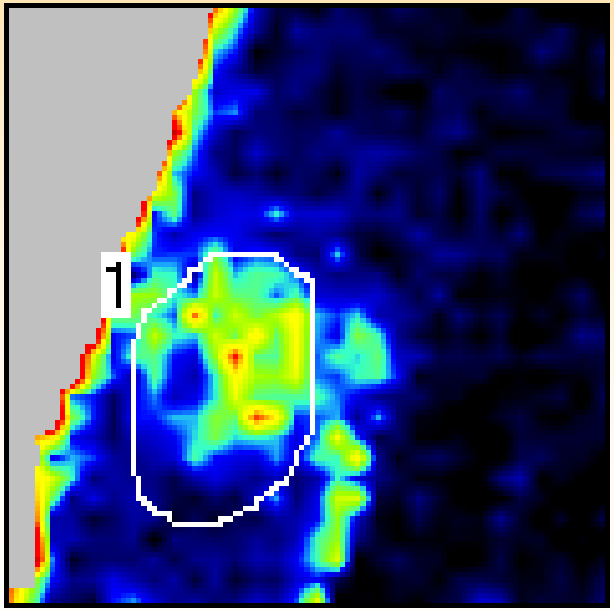
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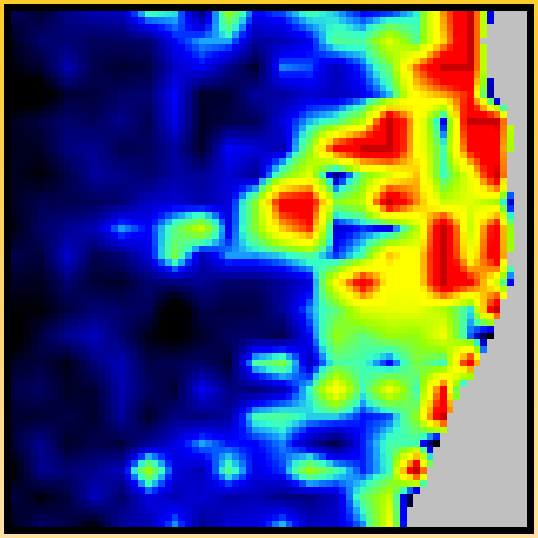

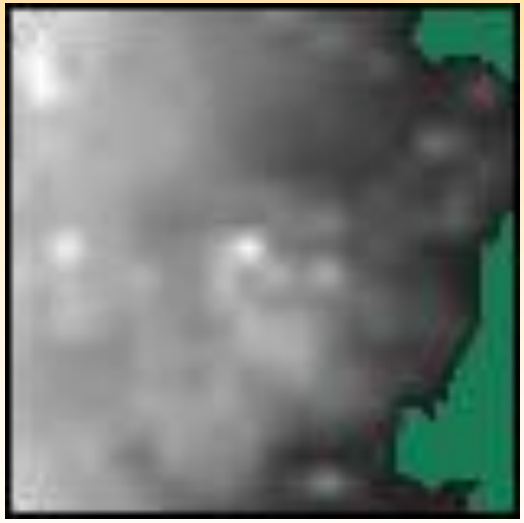

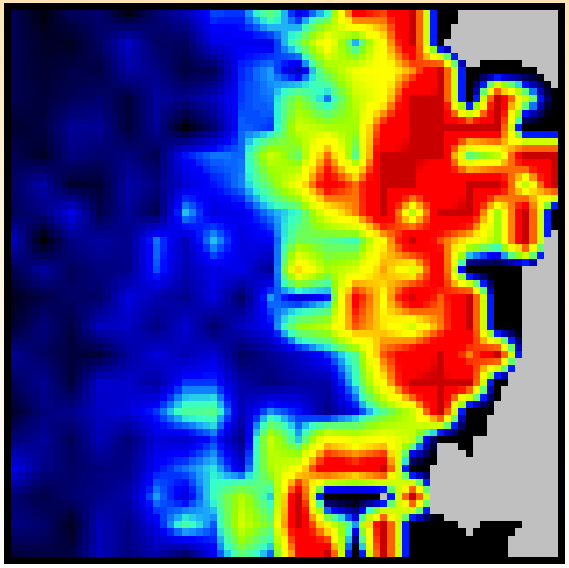


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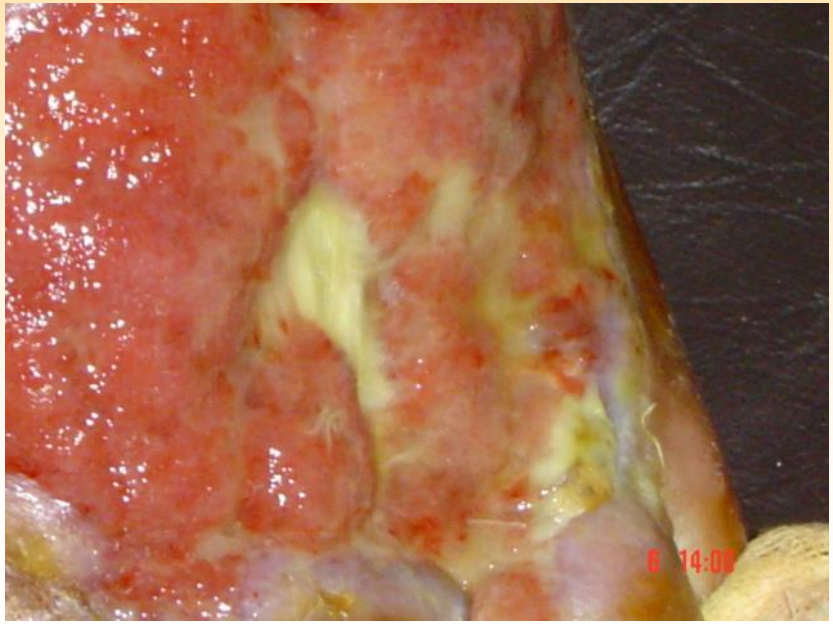
6 13:59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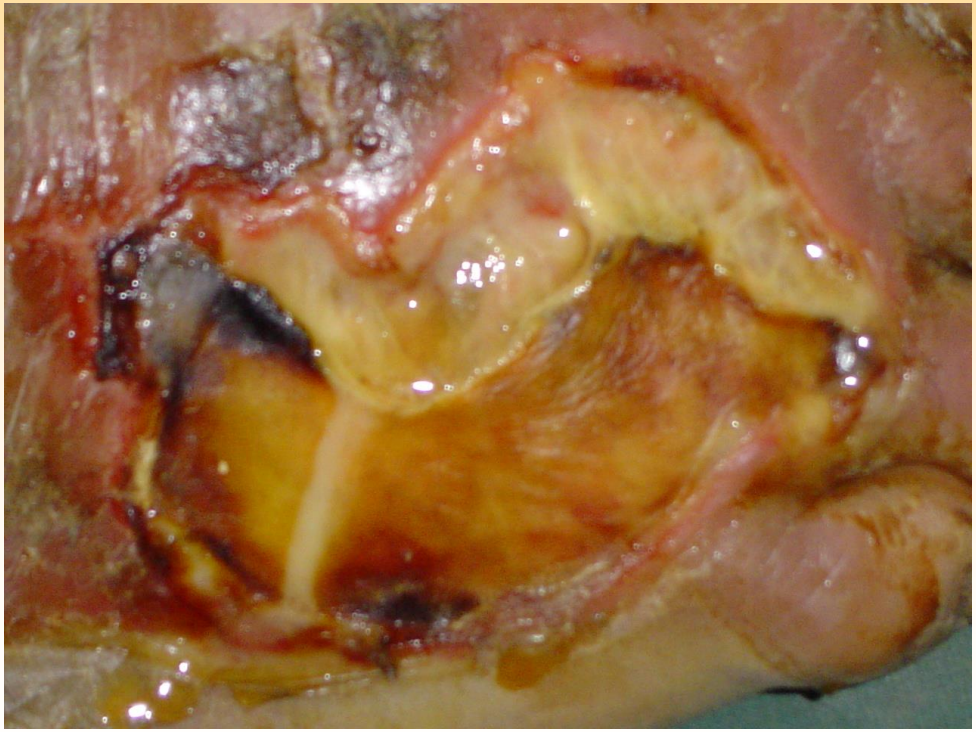


Case Presentation

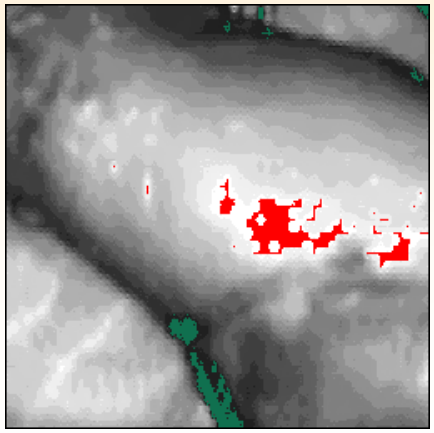
Case

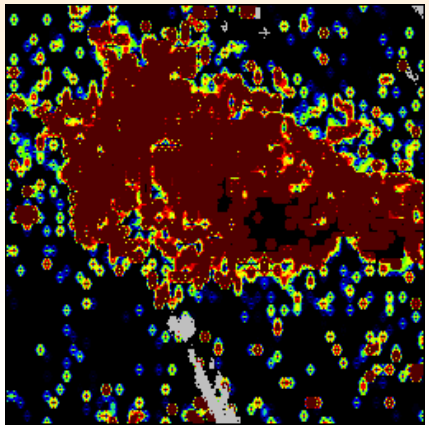
N.S
25 year old female
Traumatic ulcer (car accident)
6 months duration
Smoker.

Ankle/Brachial index
1.03

Digital plethysmography
Normal

Laser Scanner





Transcutaneous O2
89.16 mm Hg

Complete healing in two weeks

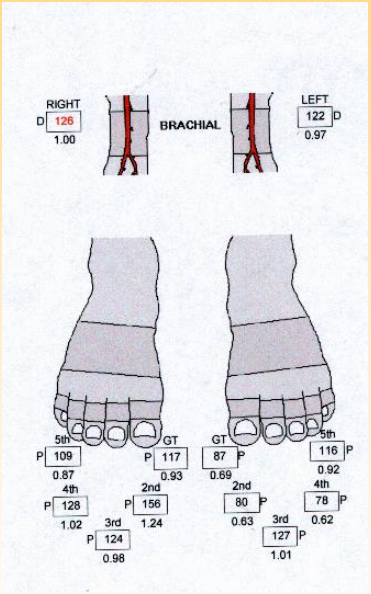
Case Presentation

Ankle/Brachial index
0.9

Case I

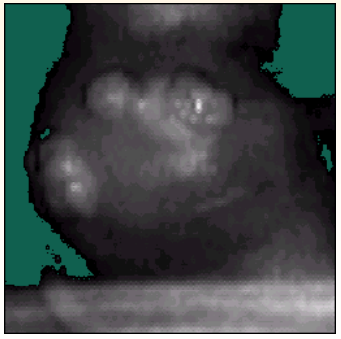
A.H.
51 year old diabetic patient
Insulin
No smoking
No hypertension
Mall ulcer 5 months

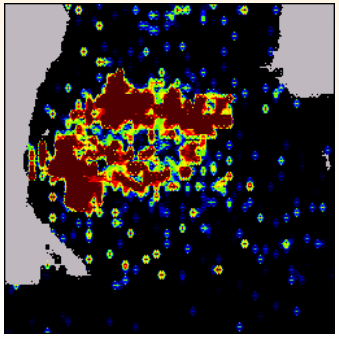
Digital plethysmography
Mild patchy affection



Transcutaneous O2
83.63 mm Hg

Laser scanner





Partial healing in 4 weeks

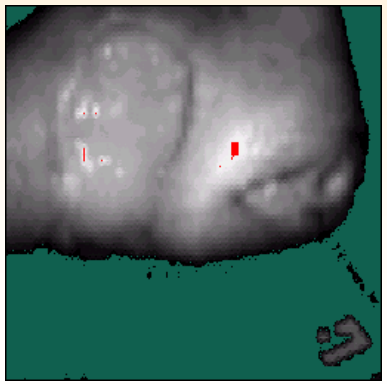
Case Presentation

Case II

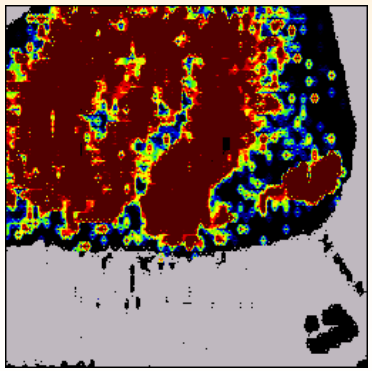
Ankle/Brachial index 1.0

W.A.
Female patient 46 year old
10 year diabetes
Insulin and oral
Smoker
Right posterior heal ulcer

Digital pethysmography
Patchy affection



Laser scanner



Transcutaneous O2
75.43

Follow up partial healing after 3 weeks

Case Presentation

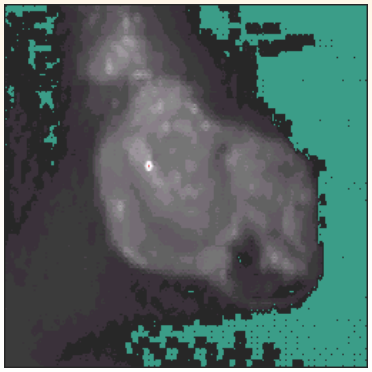
Case III

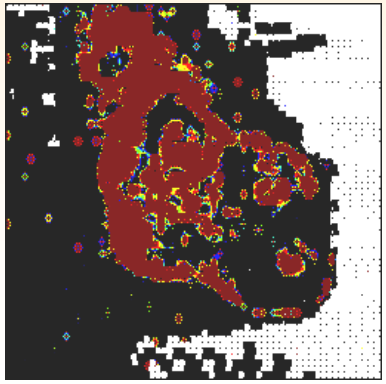
A.M.
62 year male
11 year diabetes
Insulin
Left posterior heal ulcer
Not smoker

Ankle/Brachial index
0.9

Digital plethysmography
normal

Laser Scanner





Transcutaneous O2
11.3 mm Hg

Amputation

Case Presentation

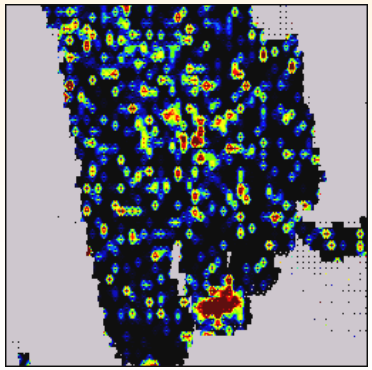
Case IV

R.A
46 year male
Diabetic 11 years on oral
Not smoker
Hypoglycemic
Ulcer on the dorsum of toe

Ankle/Brachial index
1.1

Digital plethysmography
Normal

Laser scanner



Transcutaneous O2
46 mm Hg

Complete healing in 3 weeks

Case Presentation

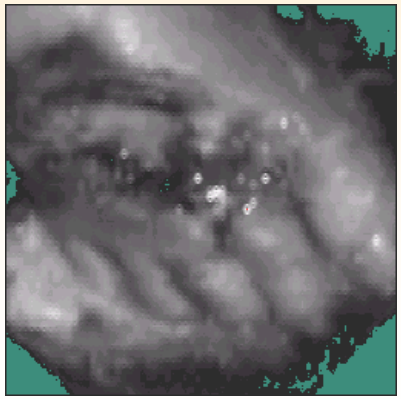
Case V

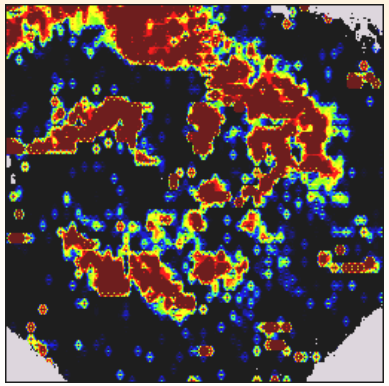
S.A.H
64 year Diabetic female
Insulin
Not smoker
Ulcer on right sole of foot

Ankle/Brachial index
0.97

Digital plethysmography
Normal

Laser Scanner





Transcutaneous O2
17.44 mm Hg

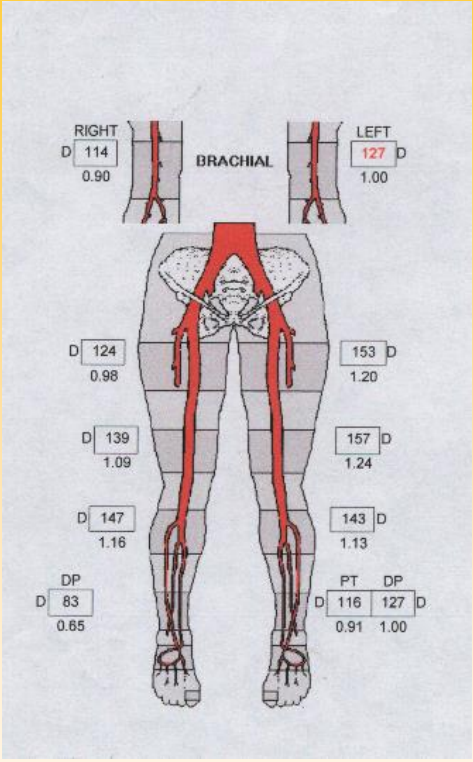
Amputation

Case Presentation

Case VII

Y.A.M
63 year old male
Diabetic on Insulin
Smoker
Ulcer right medial malleolus
and medial aspect of sole of right foot

Ankle/Brachial index
0.65



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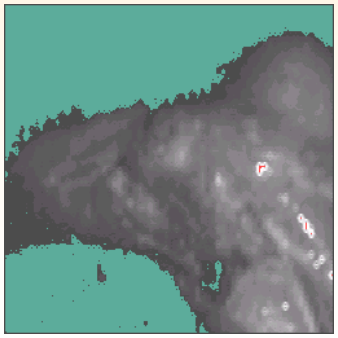
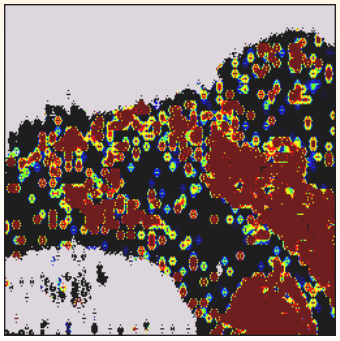




Digital plethysmography
Diffuse digital affection

Transcutaneous O2
61.55

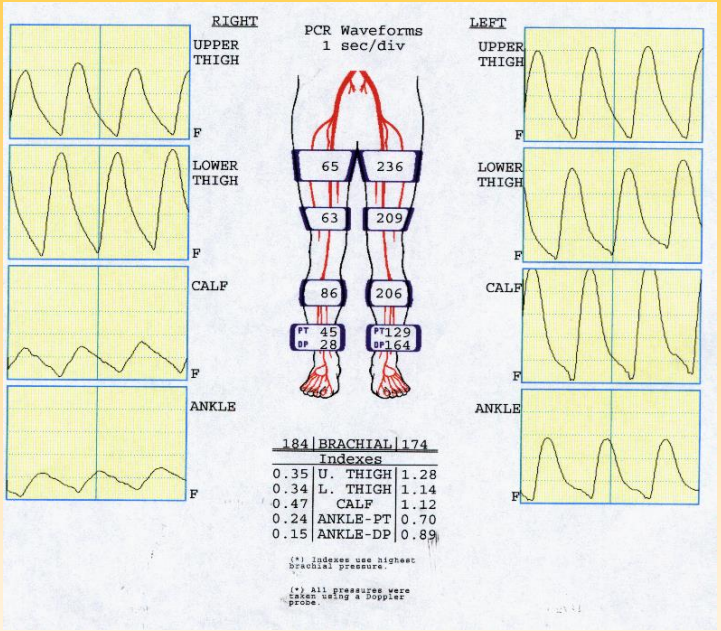
Partial healing in 5 weeks

Case Presentation

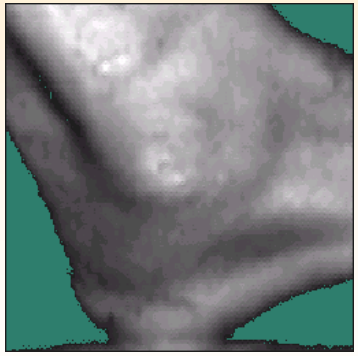
Case IX

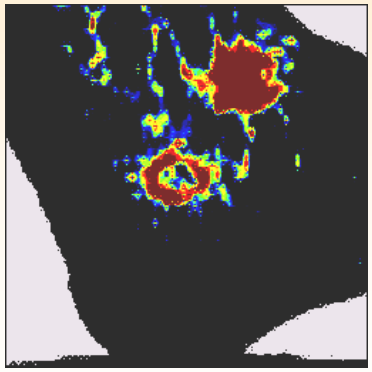
S.S.A
62 year female
Insulin
Ulcer right lateral malleolus
Not smoker

Ankle/Brachial index
0.3



Scanner





Digital severely affected

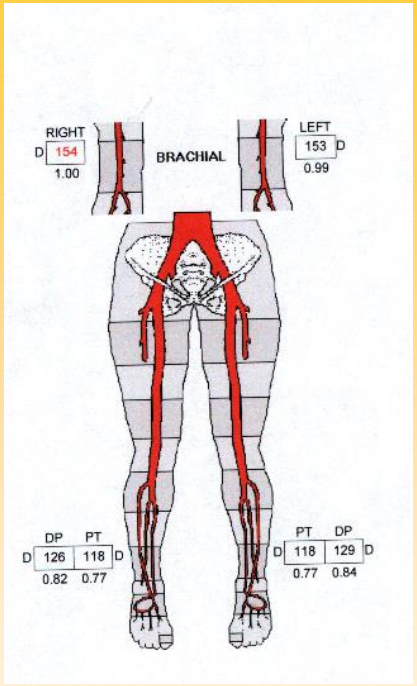
Transcutaneous O2
83.7 mm Hg

Ankle/Brachial index
0.8

Post PTA

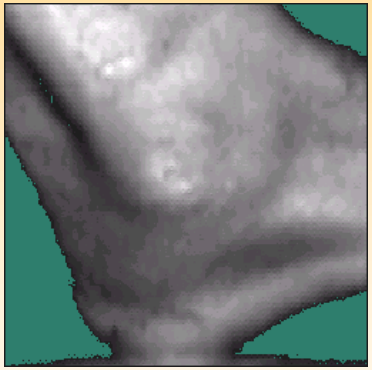
Case IX

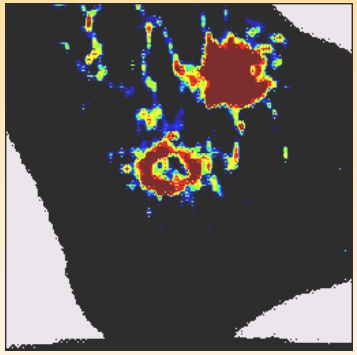
Following PTA
Of iliac artery



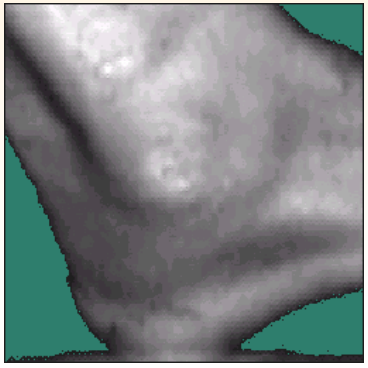
Laser Scanner

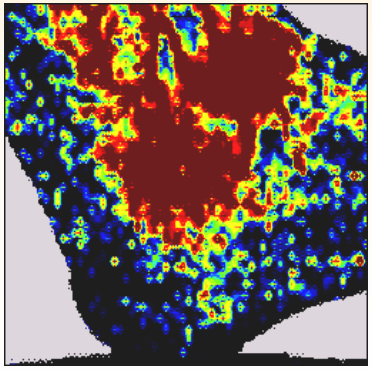
Pre





Digital plethysmography
normal





72 hours
Post

Transcutaneous O2
103 mm Hg

Complete healing in 10 days

Initial results

Low O2 (<30 mm Hg) at the edge of the ulcer was associated with 60-70% incidence of amputation

Poor granulation tissue at the base of the ulcer as detected by Laser Doppler scanning was associated with 50-60% incidence of amputation

Combine Low O2 and poor granulation tissue was associated with 80-90% Incidence of amputation

Ultrasonic Assisted Wound Treatment

A NEW MODALITY IN TREATMENT OF DIABETIC FOOT ULCERS

By

Prof. Dr. Mona A. Nashaat

Ultrasonic Assisted Wound Treatment (UAW)

using the
Sonoca 180

It is new modality used in wound treatment as an alternative to mechanical wound debridement.

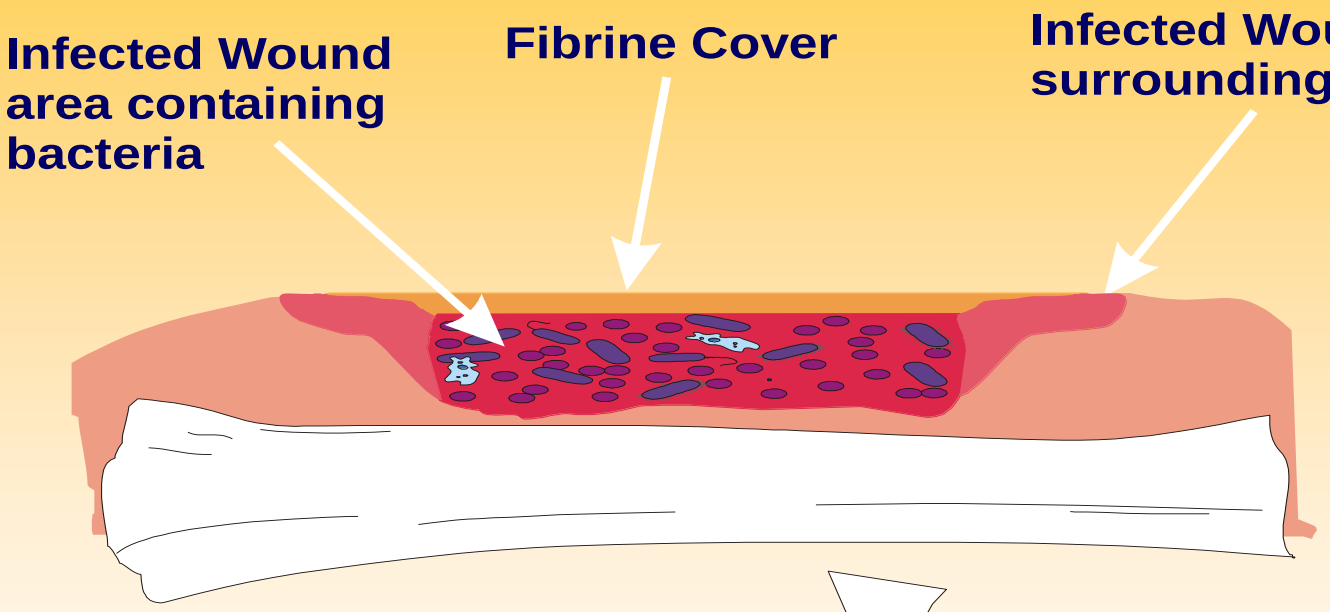
Prof. Mona Nashaat

Indcations for UAW

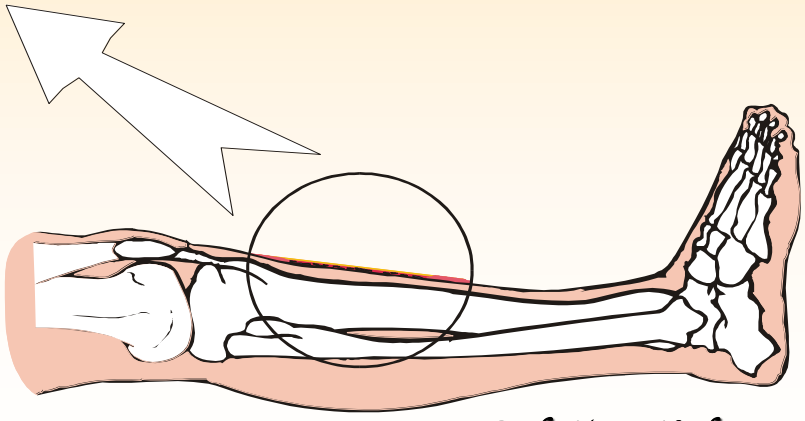
After therapy of the primary disease

It is used to treat coated, infected or partly necrotic wounds

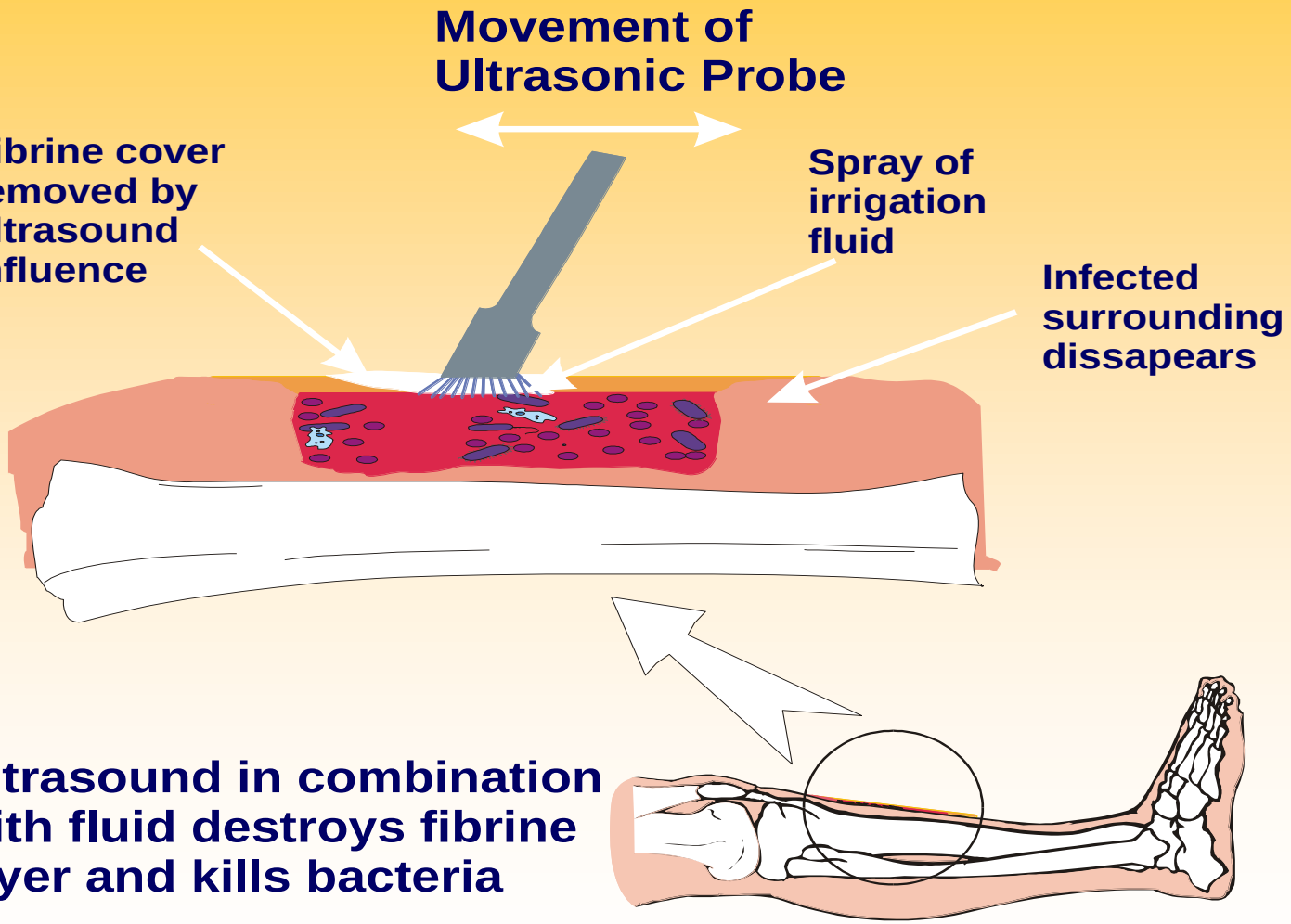
Chronic infected wound



Fibrine cover seals bacteria in wound & offers best growing conditions



Treatment principle



Prof. Mona Nashaat

UAW penetrates with high-efficiency in deep cavitations, Where micro gas bubbles imploding cyclically

↓

destruction of bacteria, viruses and fungi

The ultra-sound pulse → wound treatment solution penetrates more deep into fissures

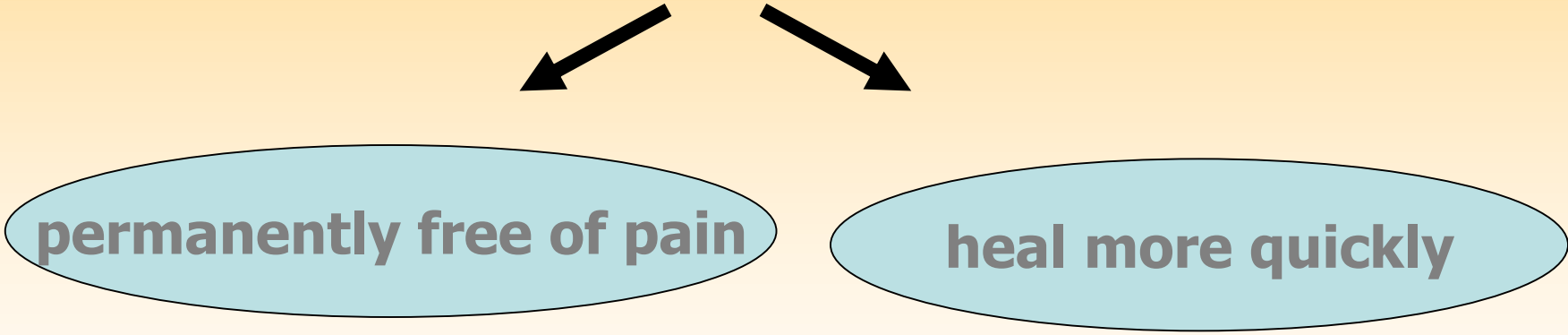
↓

mechanical rinsing effects

Prof. Mona Nashaat

– Bacterial remnants are broken down, wound environment turns

Neutral

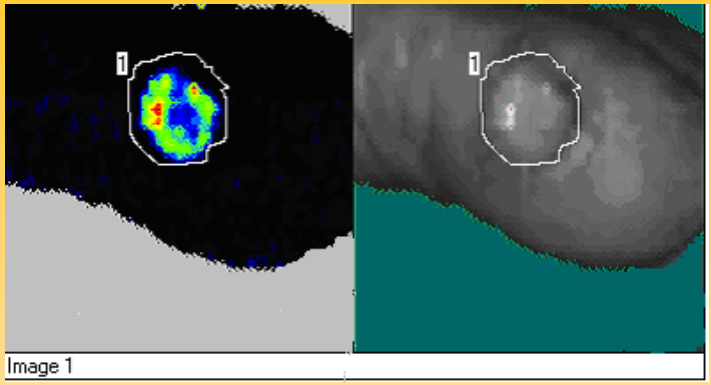


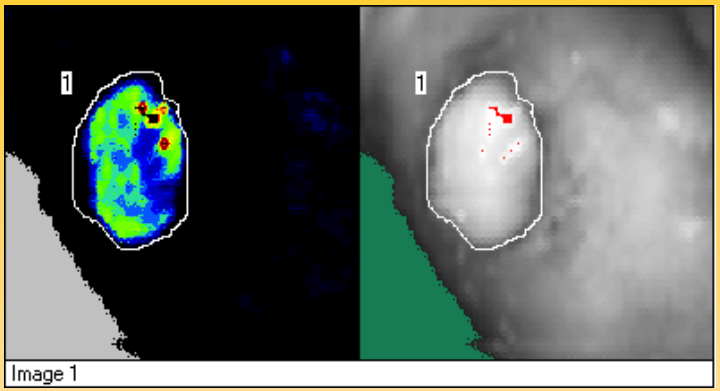
N.B. : Infected chronic wounds are acidic that induces pain.

Before TT

Immediate after 1est session

16 Feb

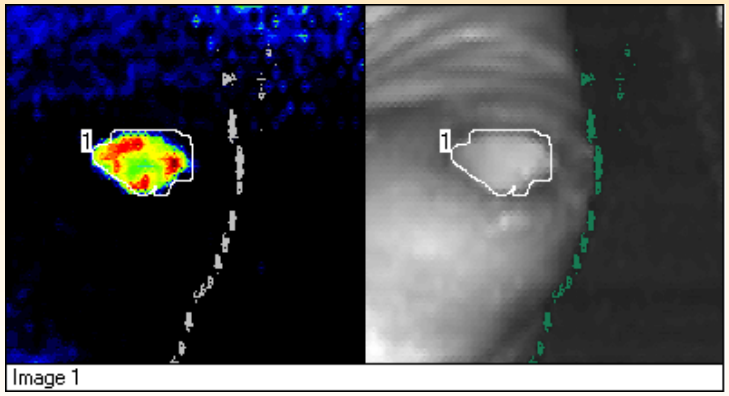


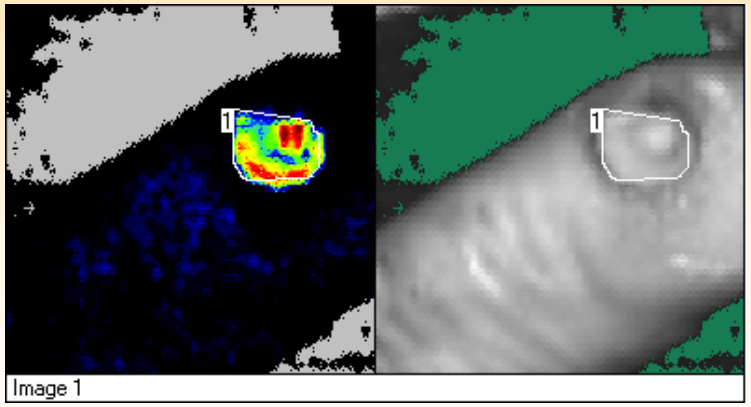


Mean= 0.77
Std.dev=0.68
Max= 3.21

Mean= 0.92
Std.dev=0.59
Max= 2.16

19 Feb

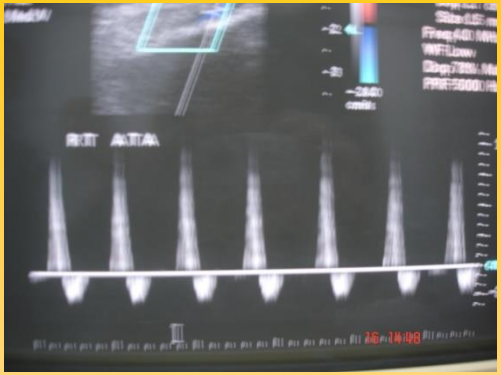


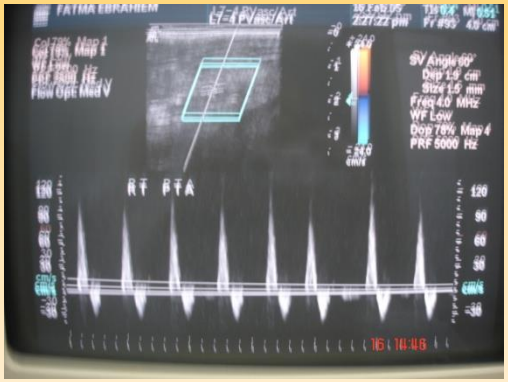


Mean=1.11
Std.dev= 0.70
Max= 4.81

Mean= 1.17
Std.dev=0.58
Max= 2.46

Prof. Mona Nashaat





- **F.k. ♀ 42yeas,**
- **3m diabetic discovery**
- **On insulin therapy**
- **No proper control**
- **Ulcer on dorsum of right big toe**
- **resistant to treatment 3months**

Prof. Mona Nashaat

16 Feb 2005

19 Feb 2005

21 Feb 2005

23 Feb 2005

28 Feb

2 mars 2005

15 mars

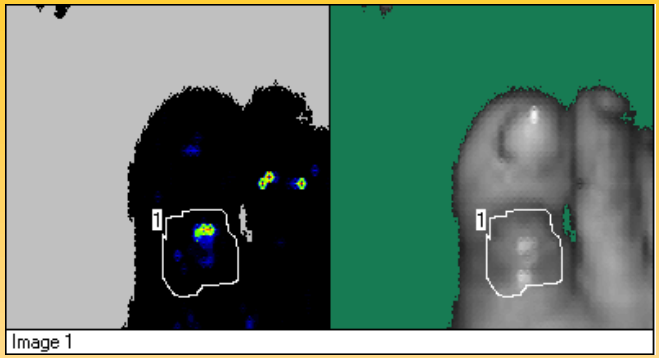
Complete closure of the wound after 6 sessions

Prof. Mona Nashaa

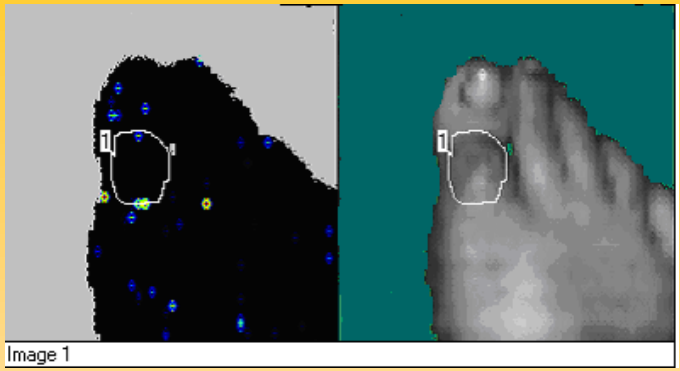
Before TT

Immedialy after 1est session

16 Feb. 2005

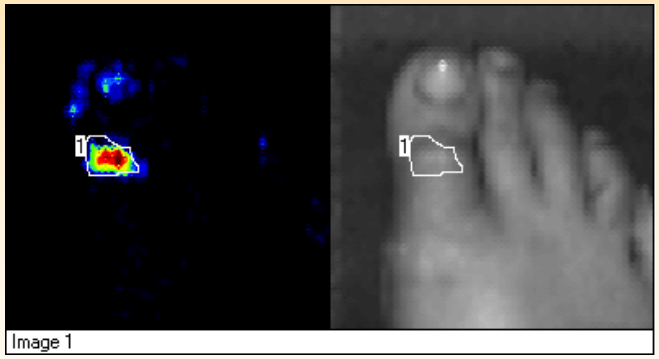


Mean= 0.4
Std.dev=0.01
Max= 0.66

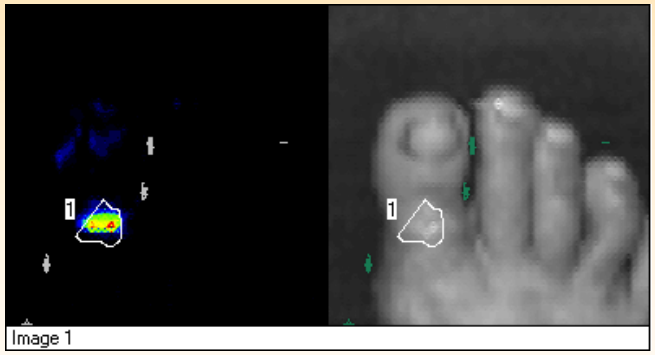


Mean= 0.01
Std.dev=0.21
Max= 0.21

19 Feb 2005



Mean= 1.46
Std.dev=1.03
Max= 3.42



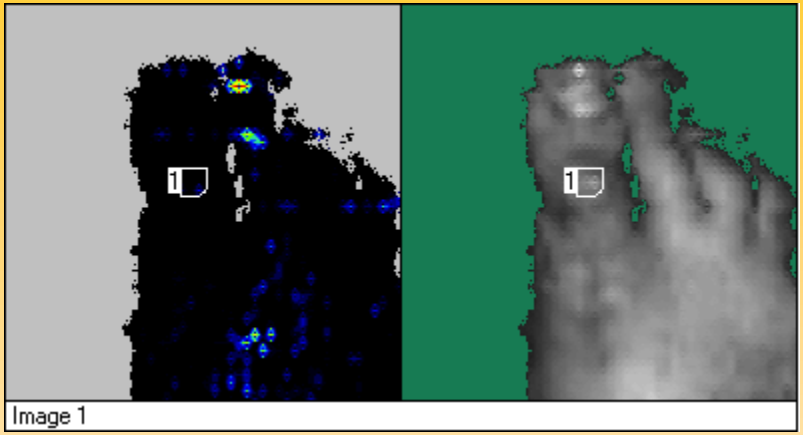
Mean= 0.99
Std.dev=0.95
Max= 3.85

Prof. Mona Nashaat

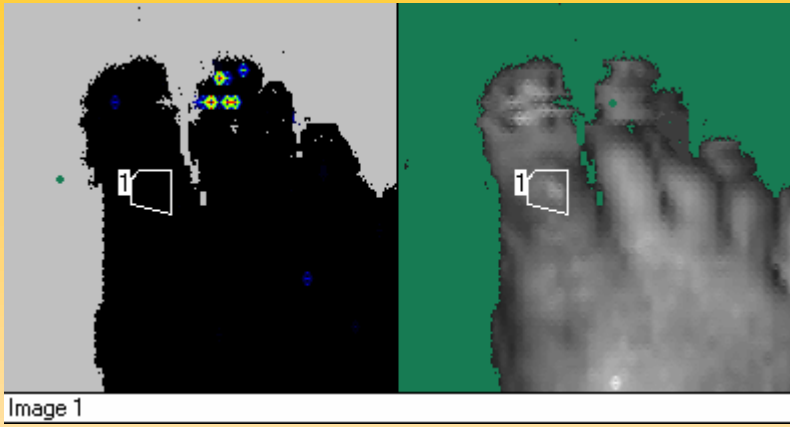
Before

After

23 Feb

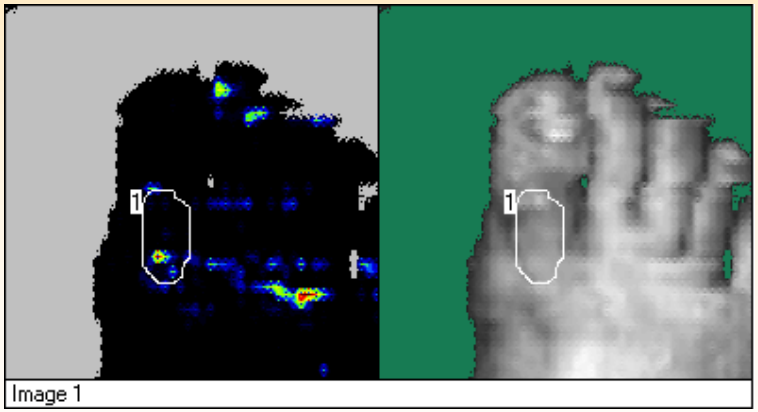


Mean= 0.04
SD= 0.09
Max= 0.28



Mean= 0.00
SD= 0.00
Max= 0.01

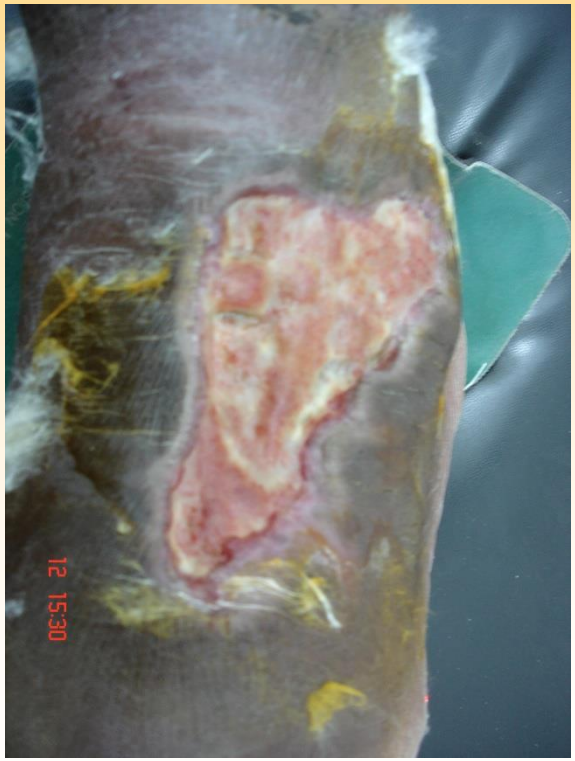
28 Feb

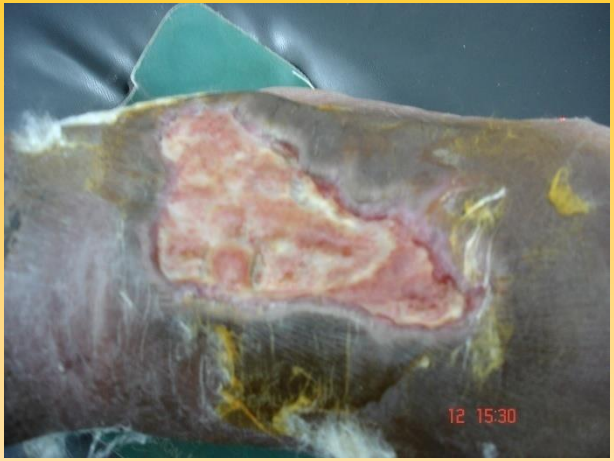


Mean= 0.18
SD = 0.34
Max = 2.41

Prof. Mona Nas

- **S.M.B. ♂ 60 years**
- **Erysipelas of the left L.L. since > 1 year**
- **Surgical debridement the ulcer**
- **Resistant to treatment**





12 Feb 2005

23 Feb 2005

28 Feb 2005

2 mars 2005

7 mars 2005

Prof. Mona Nashaat

Data Under evaluation

Prolonged follow up for cases with partial healing

The role of digital artery affection in the prognosis
Of diabetic foot

The role of neuropathy in the prognosis of diabetic foot

The effect of different modalities of conservative therapy
On the prognosis of diabetic foot


2007 1 17


Thank You