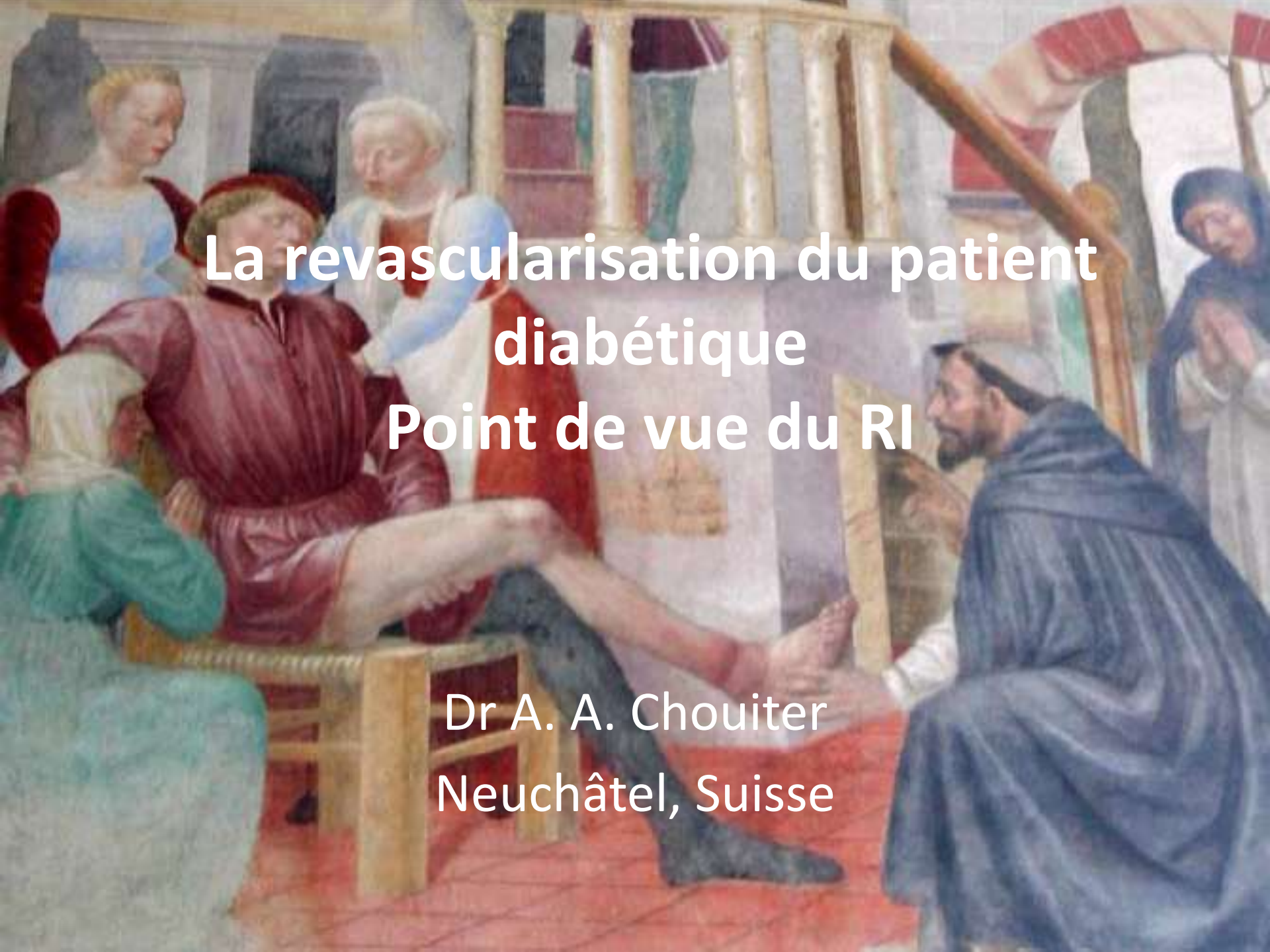


La revascularisation du patient diabétique
Point de vue du RI

Dr A. A. Chouiter
Neuchâtel, Suisse

Spécificités de l'artériopathie périphérique du patient diabétique

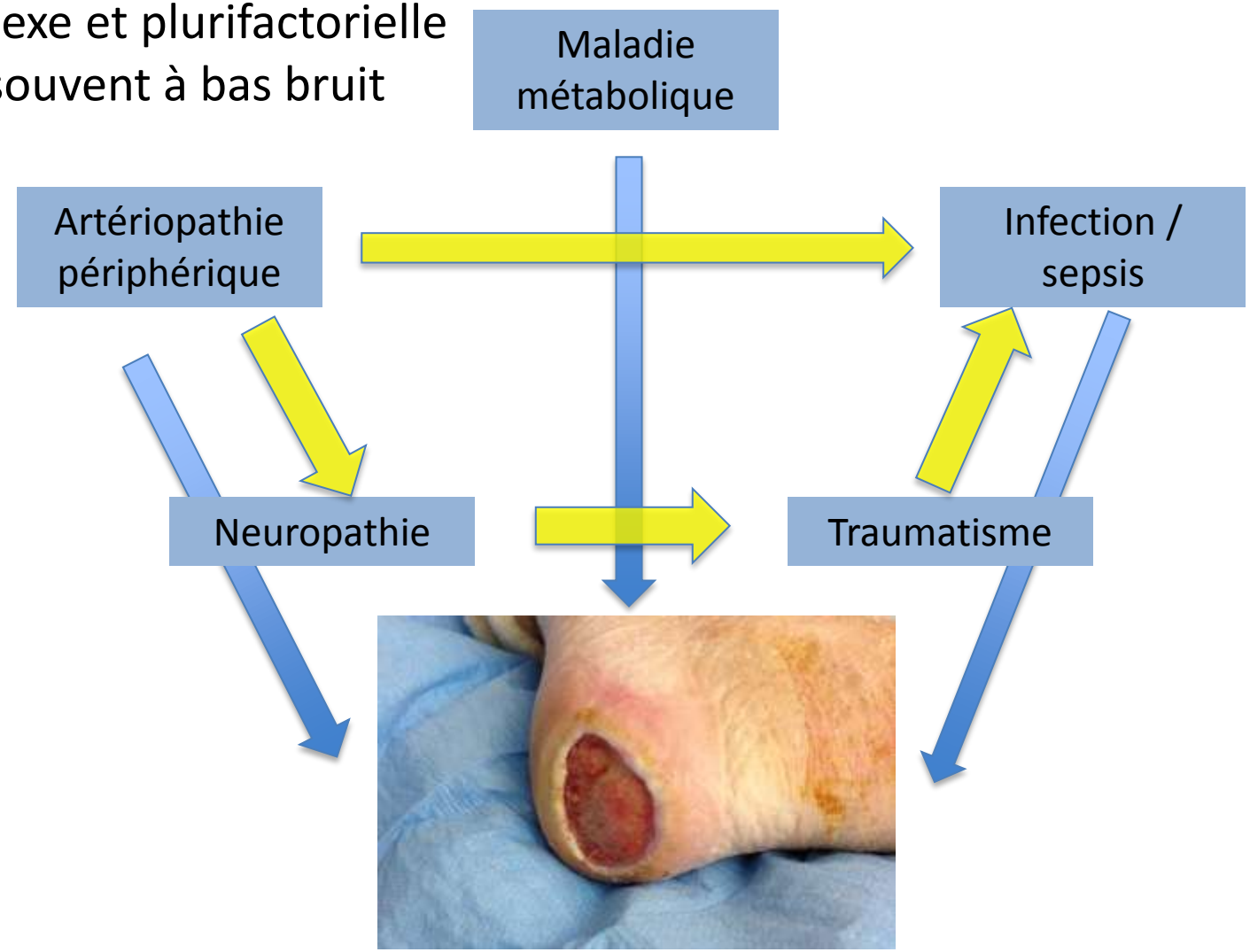
- Maladie artérielle diffuse +++ (décourageante)
- Médiacalcinose
- Macro et Microangiopathie
- A prédominance sous géniculée
- ++ atteinte sous la cheville

Lésions vasculaires jambières

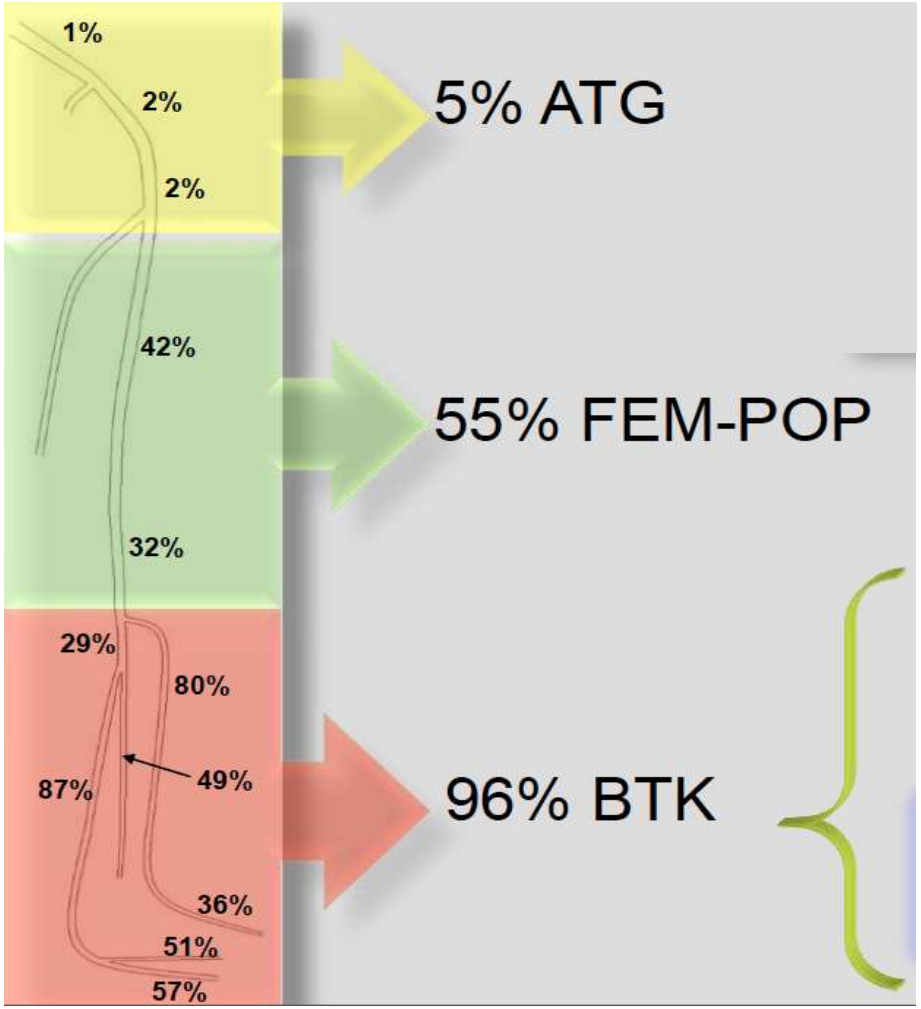
- Ischémie critique:
  - AOMI stade III de LF = Dlrs de repos (décubitus)
  - AOMI stade IV de LF = perte de substance

Physiopathologie du pied diabétique

- Maladie complexe et plurifactorielle
  - Evolution souvent à bas bruit



Spécificités de l'atteinte vasculaire chez le patient diabétique



TPT	29%
0 BTK vessel	4%
1 BTK vessel	14%
2 BTK vessels	42%
3 BTK vessels	40%

Maladie diffuse +++ du territoire jambier

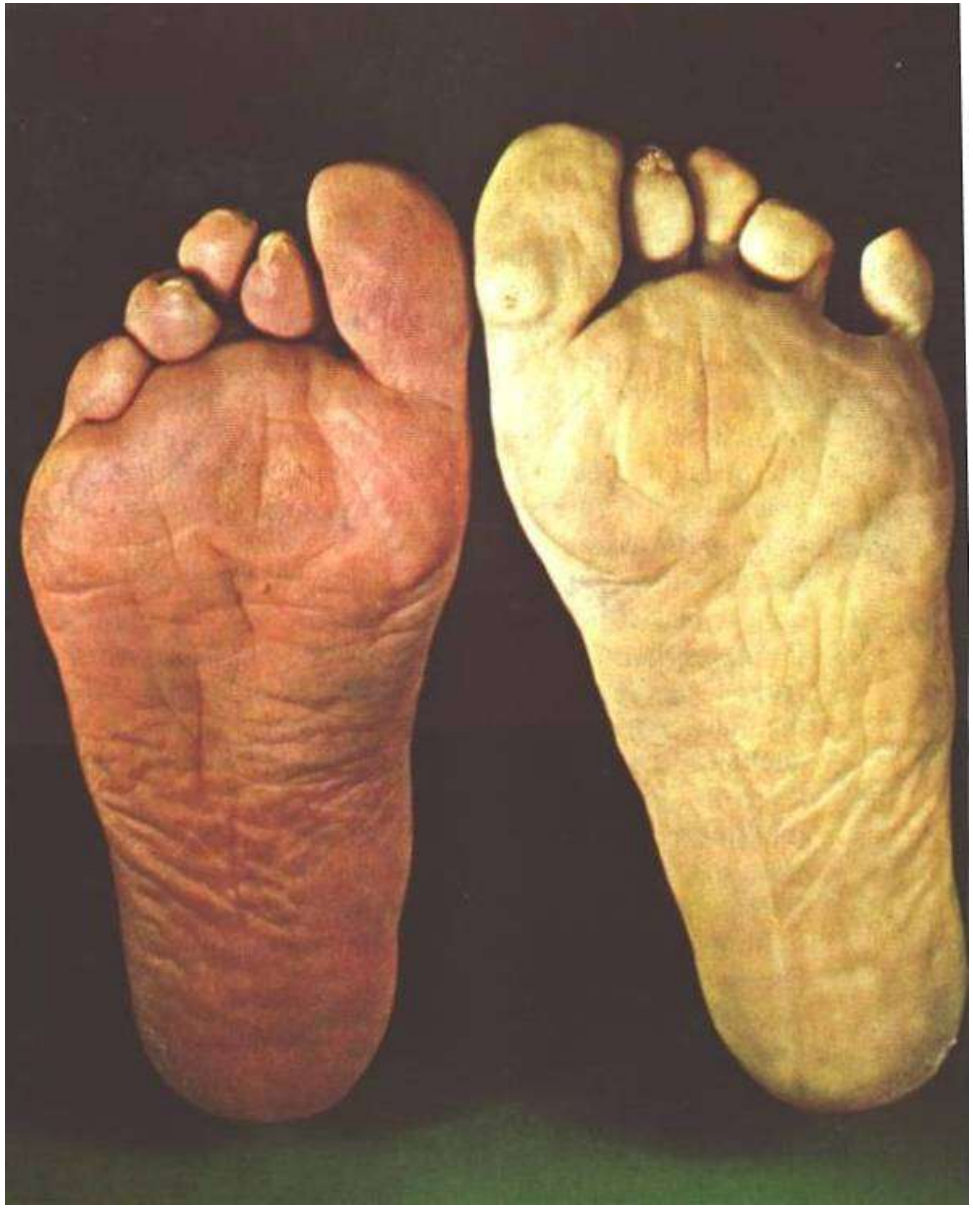
Bilan pré-op

- Examen clinique:
  - Pouls
  - Etat des téguments
    - Plaie artérielle vs veineuse
  - **IPS (ABI)**
- Anamnèse

- **Inspection**

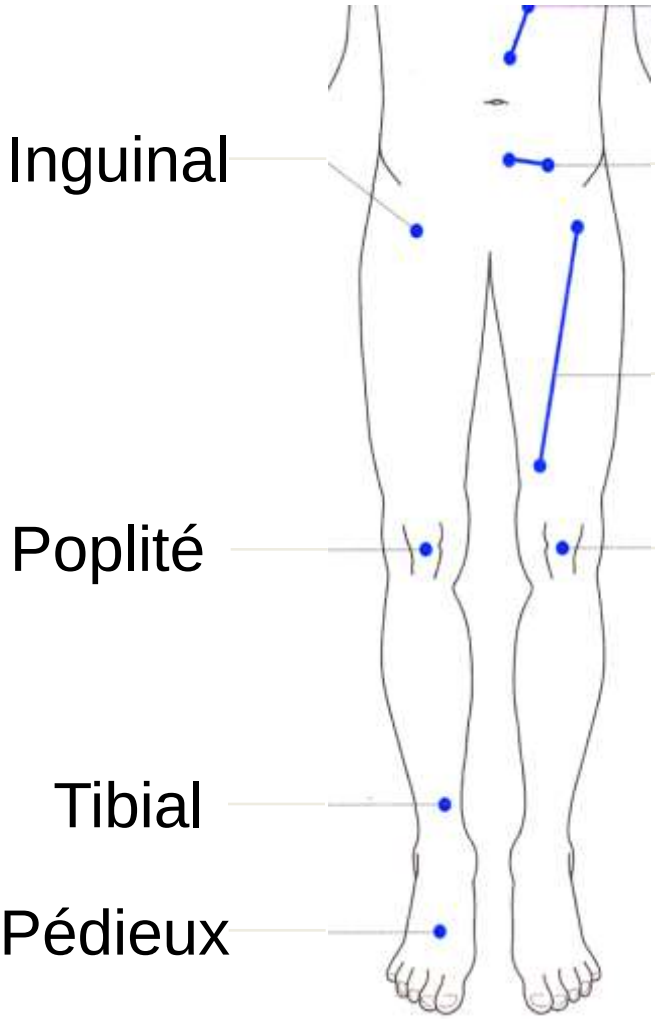
- Souliers, forme du pied
- Cicatrices
- Couleur des extrémités
  - Température et temps de recoloration capillaire: non fiables

- Troubles trophiques
- Distribution des lésions



Test de Ratschow

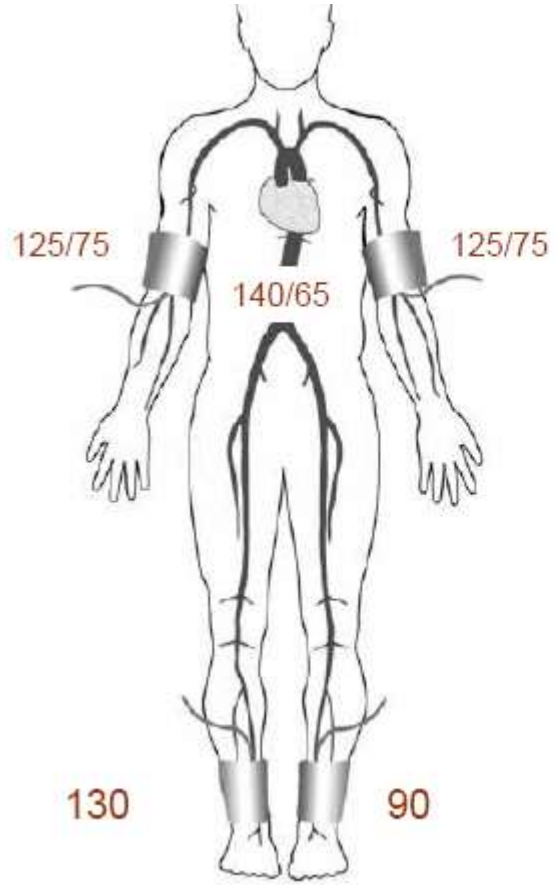
Palpation et Auscultation



Auscultation :

Sténose ou occlusion ?

Index cheville / bras (ABI)



ABI= $\dfrac{\text{Pression systolique la plus haute à la cheville}}{\text{Pression systolique humérale la plus haute}}$

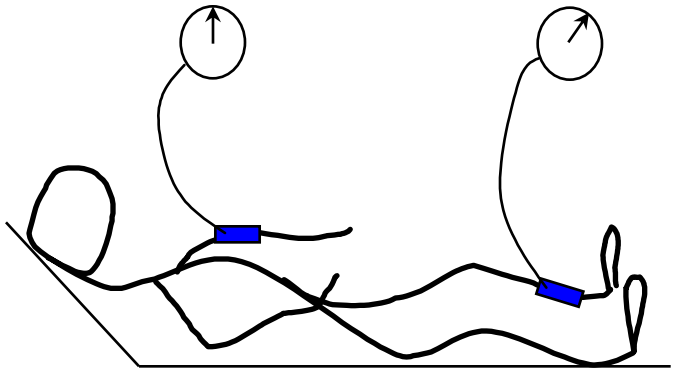
Droite $ABI = \dfrac{130}{125} = 1{,}04$

Gauche $ABI = \dfrac{90}{125} = 0{,}72$

Index cheville / bras (ABI) (IPS)

Pression systolique bras

Pression systolique cheville



$$ABI = \frac{\text{P. sys. cheville}}{\text{P. sys. bras}}$$

Valeur normale
ABI: = 0,9

Si **ABI** > 1,3 suspicion :
Médiacalcinose
(diabète, insuffisance rénale chronique…)

Plethysmographie ou pression systolique au gros orteil

TCPO2

〈 30 mmHg
Pas de capacité
« perfusionnelle » suffisante
de cicatrisation

Quelle imagerie pré thérapeutique

- Echo-Doppler
- Angio-Scanner
- Angio-IRM
- Angiographie (IR, CO_2)

Angio-CT

- Avantages
  – Etude de la paroi artérielle
- – Etude des calcifications

- Limites
  – Fonction rénale,
- – Etude du réseau distal difficile (Médiacalcinose chez diabètique)

Lésions vasculaires jambières

Ischémie critique

Stade III L & F

Stade IV L & F

Sauvetage de membre

Diabète

IR

Tabac

Le pied diabétique

Up to 70%
of all lower-leg amputations are performed on people with **diabetes***

*Prompers et al Diabetologia 2008;51: 747-755. Apelqvist et al Diabetes Metab Res Reviews 2000;16 (Suppl 1) S75-S83

Every 20 secs
a limb is lost to diabetes*

*www.iwgdf.org

Protocole de traitement

1. **Trt de l'infection**

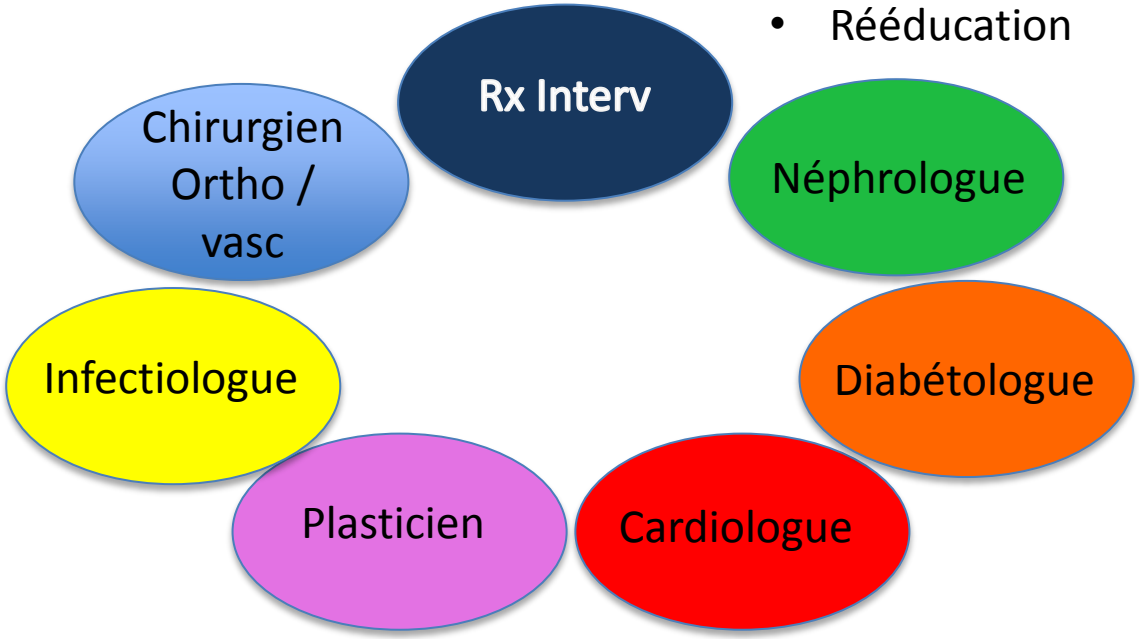
- Débridement et chirurgie d'urgence (Gangrène, abcès, phlegmon)
- Culture bactérienne et antibiothérapie
- Traitement métabolique

2. **Revascularisation**

- angioplastie
- pontage

3. Traitement final

- Médical
- Chirurgical
- Prothétique
- Rééducation



Ulcère diabétique – options endovasculaires

Quelle est la meilleure artère à recanaliser?

- **1 vessel better than 0**
- **2-3 vessels better than 1**
- **Tibials better than peroneal**

Ulcère diabétique – options endovasculaires

- Concept des angiosomes

Revascularisation de l'artère a destinée du territoire de l'ulcère.

Ulcère diabétique – options endovasculaires

- Concept des angiosomes

Angiosomes of the Foot and Ankle and Clinical Implications for Limb Salvage: Reconstruction, Incisions, and Revascularization

Christopher E. Attinger, M.D.
Karen Kim Evans, M.D.
Erwin Bulan, M.D.
Peter Blume, D.P.M.
Paul Cooper, M.D.
Washington, D.C., New Haven, Conn., and Mulmore, N.J.

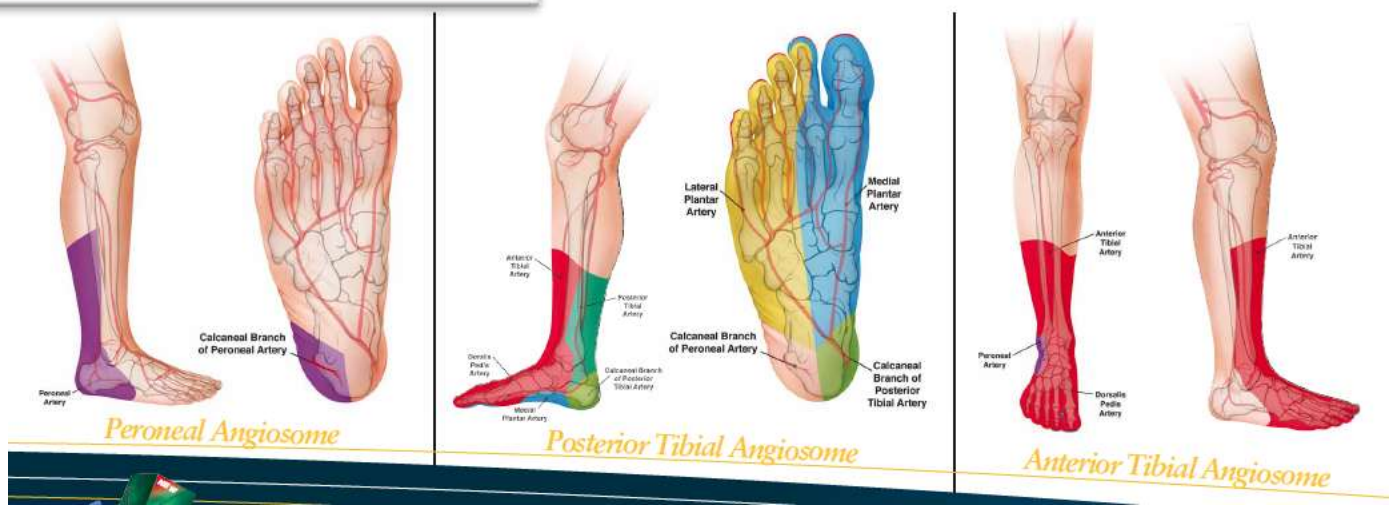
Background: Ian Taylor introduced the angiosome concept, separating the body into distinct three-dimensional blocks of tissue fed by source arteries. Understanding the angiosomes of the foot and ankle and the interaction among their source arteries is clinically useful in surgery of the foot and ankle, especially in the presence of peripheral vascular disease.
Methods: In 50 cadaver dissections of the lower extremity, arteries were injected with methyl methacrylate in different colors and dissected. Preoperatively, each reconstructive patient's vascular anatomy was routinely analyzed using a Dopp-

Selective Primary Angioplasty Following an Angiosome Model of Reperfusion in the Treatment of Wagner 1–4 Diabetic Foot Lesions: Practice in a Multidisciplinary Diabetic Limb Service

Vlad-Adrian Alexandrescu, MD[1]; Gerard Hubermont, MD[2]; Yvan Philips, MD[2]; Benoit Guillaumie, MD[1]; Christian Ngongang, MD[1]; Pierre Vandenbossche, MD[3]; Khalid Azdad, MD[4]; Gilles Ledent, MD[4]; and Jacques Horion, MD[5]

A reliable approach to diabetic neuroischemic foot wounds: below-the-knee angiosome-oriented angioplasty.

Alexandrescu V, Vincent G, Azdad K, Hubermont G, Ledent G, Ngongang G, Filimon AM



- Lateral projection

- AP projection

Revascularisations jambières
Téchnique

Lésions courte VS **étendues**

Sténoses VS **occlusions**

Choisir l'abord
fémoral antégrade
chaque fois qu'il sera
possible!

Abord antégrade

- Long introducteur 5F (6F) jusqu'en poplité.
- Proximité du territoire lésionnel
- Réduit les besoins en CM (IR)
- Améliore le push et le torque

Antegrade approach tools

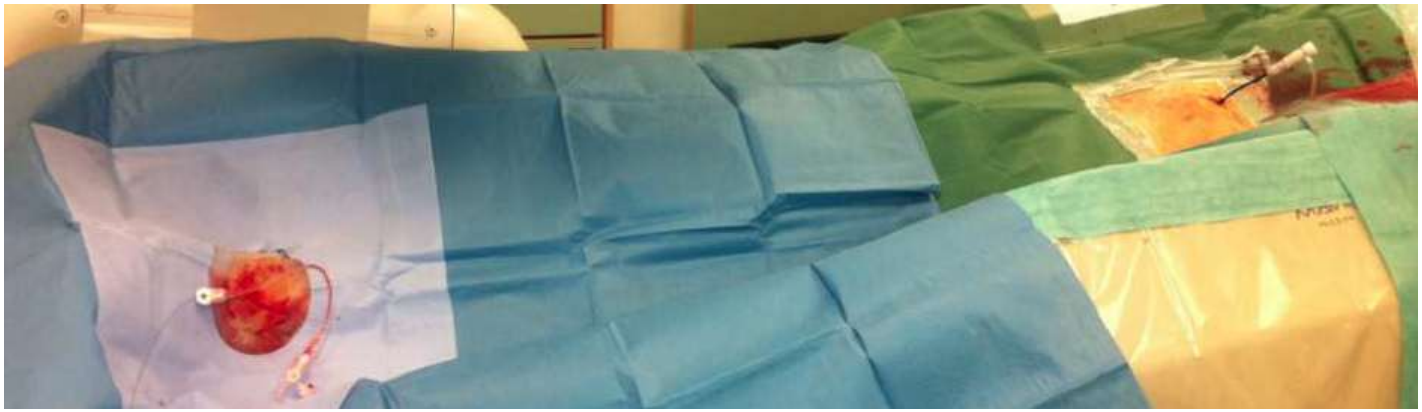
- Long 4/5F introducer 45 (55) cm
- **0.014** or 0.018 (0.035) guide wire (WH vs CTO)
- Ballonnets nus ou médicamenteux
- Stents médicamenteux
  - Stents coronaires

- Longues occlusions / occlusions multiples

Abord antégrade

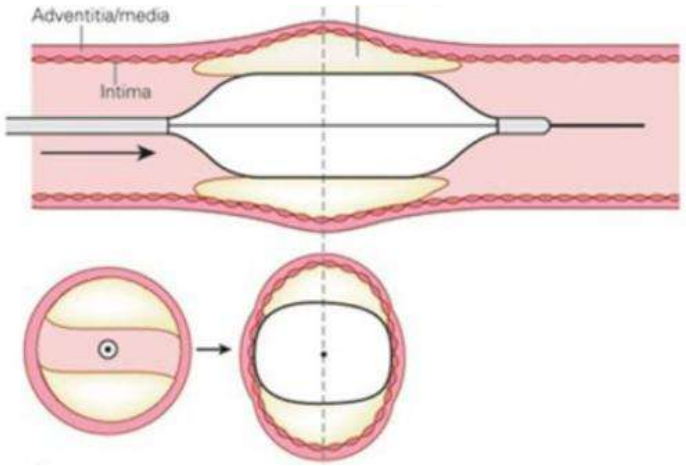
±

Abord rétrograde

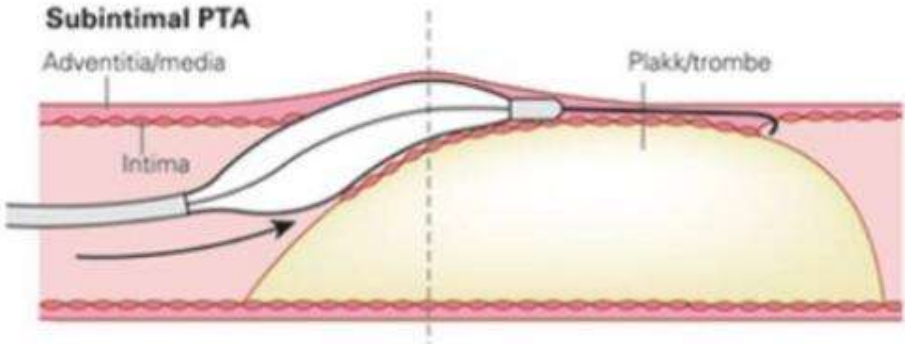


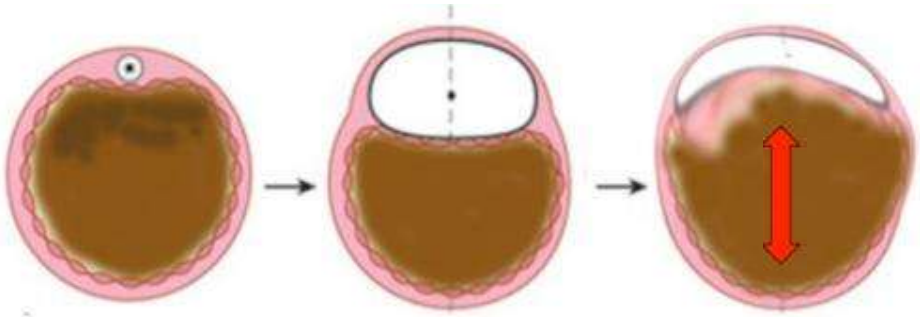
Endoluminal Recanalization

- Central Lumen Navigation
  - Clinically preferred strategy, "phyiologic"
  - Maximizes therapeutic options
    - Adjunctive devices designed to operate in the arterial lumen
  - Majority of published therapeutic device results are performed in the central lumen
  - **Not compromising collateral circulation?**



Subintimal recanalisation… suboptimal Revascularization ?





- Strongly influences the vessel anatomy causing spiral dissections

- **Asymetrical effect of the balloon dlatation** (only the vessel outer layer)

- **Limited remodeliing of the calcied foci** (high risk of elastic recoil)

- Often as bail-out with re-entry devices necessary

- Periadventitial hematomes may lead to high rates of restenosis ?

BTK interventions

STRATEGIE

- Abord
  - Antégrade
  - Rétrograde (double abord)
- Target vessel
  - Less complex vessel resolving the problem
  - Angiosome concept
- Endo vs Subintimal
- Tools:
  - Guides **0.014** 0.018 0.035
  - DEB
  - DES

Meta-analysis

JOURNAL OF ENDOVASCULAR THERAPY

Journal of Endovascular Therapy
1–13

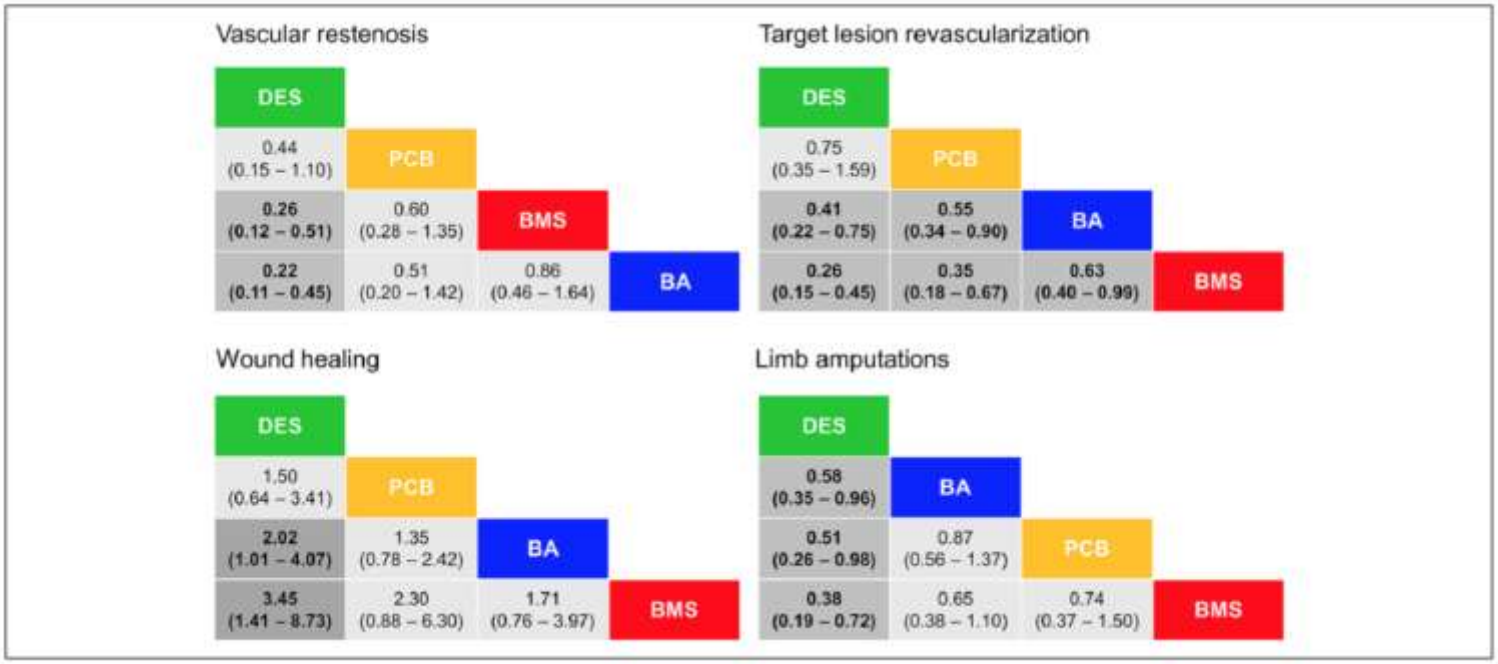
DOI: 10.1177/1526602816671740
www.jevt.org
SAGE

Comparative Effectiveness of Plain Balloon Angioplasty, Bare Metal Stents, Drug-Coated Balloons, and Drug-Eluting Stents for the Treatment of Infrapopliteal Artery Disease: Systematic Review and Bayesian Network Meta-analysis of Randomized Controlled Trials

Konstantinos Katsanos, MSc, MD, PhD, EBIR[1], Panagiotis Kitrou, MD, PhD[2], Stavros Spiliopoulos, MD, PhD, EBIR[3], Athanasios Diamantopoulos, MD, PhD[1], and Dimitris Karnabatidis, MD, PhD, EBIR[2]

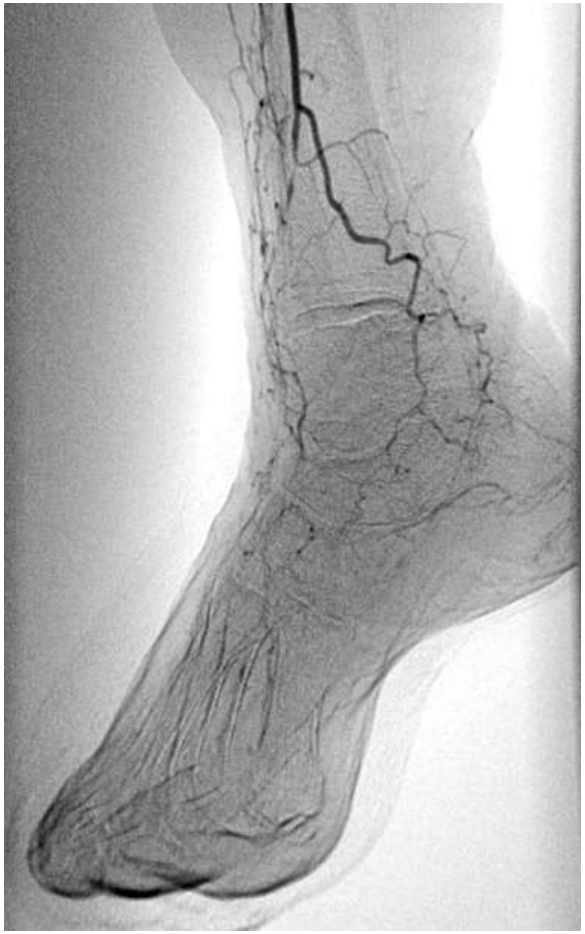
- 16 RCTs
- 1805 patients at 1 year median FU

Results

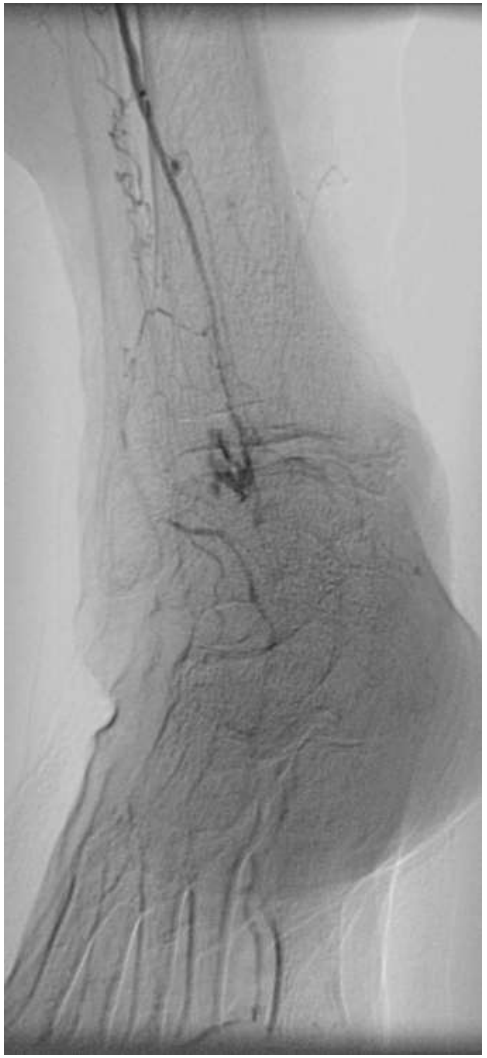

Vascular restenosis
DES
0.44 (0.15 – 1.10)
PCB
0.26 (0.12 – 0.51)
0.60 (0.28 – 1.35)
BMS
0.22 (0.11 – 0.45)
0.51 (0.20 – 1.42)
0.86 (0.46 – 1.64)
BA
Target lesion revascularization
DES
0.75 (0.35 – 1.59)
PCB
0.41 (0.22 – 0.75)
0.55 (0.34 – 0.90)
BA
0.26 (0.15 – 0.45)
0.35 (0.18 – 0.67)
0.63 (0.40 – 0.99)
BMS
Wound healing
DES
1.50 (0.64 – 3.41)
PCB
2.02 (1.01 – 4.07)
1.35 (0.78 – 2.42)
BA
3.45 (1.41 – 8.73)
2.30 (0.88 – 6.30)
1.71 (0.76 – 3.97)
BMS
Limb amputations
DES
0.58 (0.35 – 0.96)
BA
0.51 (0.26 – 0.98)
0.87 (0.56 – 1.37)
PCB
0.38 (0.19 – 0.72)
0.65 (0.38 – 1.10)
0.74 (0.37 – 1.50)
BMS

Mme K.J 1922
Diabetes mellitus
Stade IV L&F O2 et O3

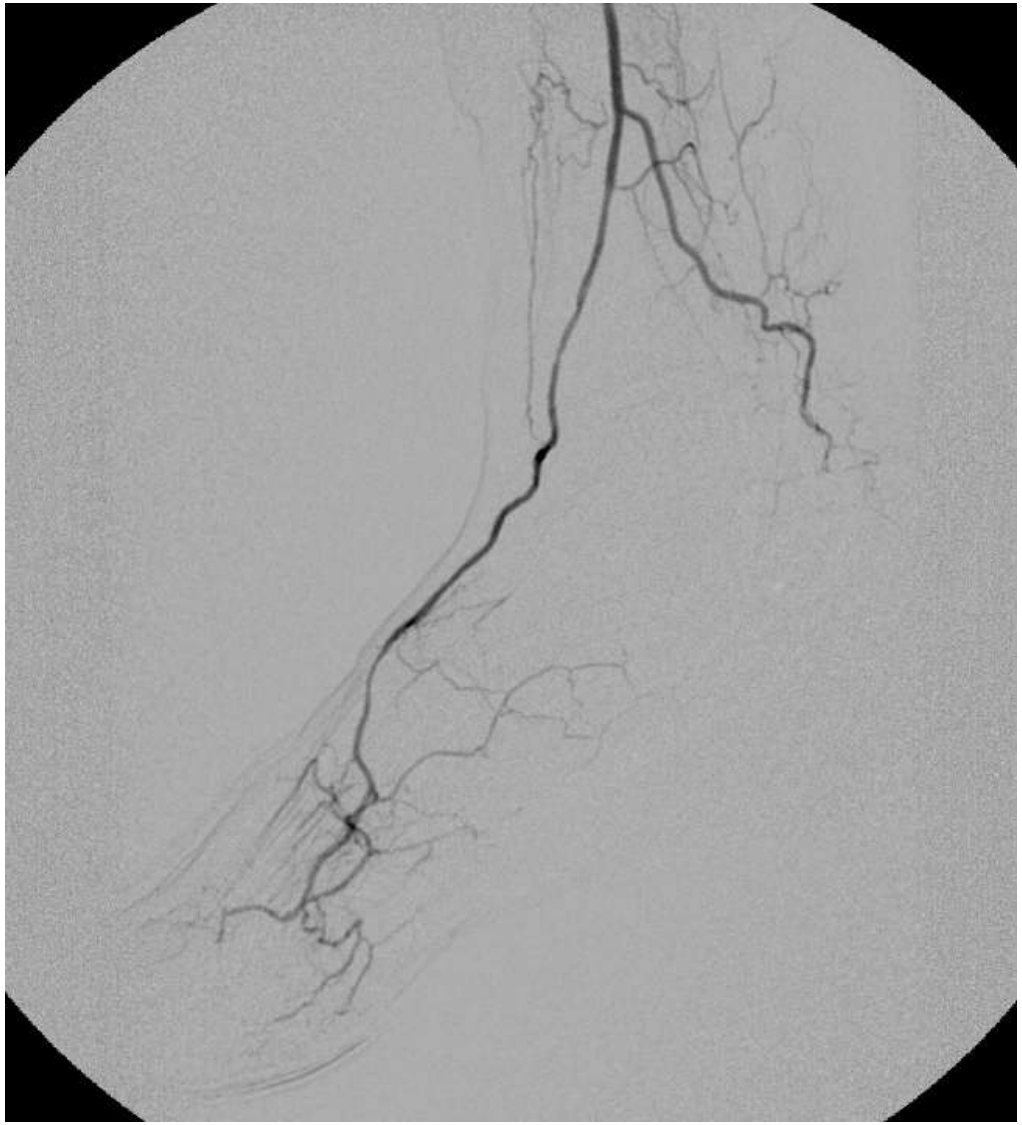


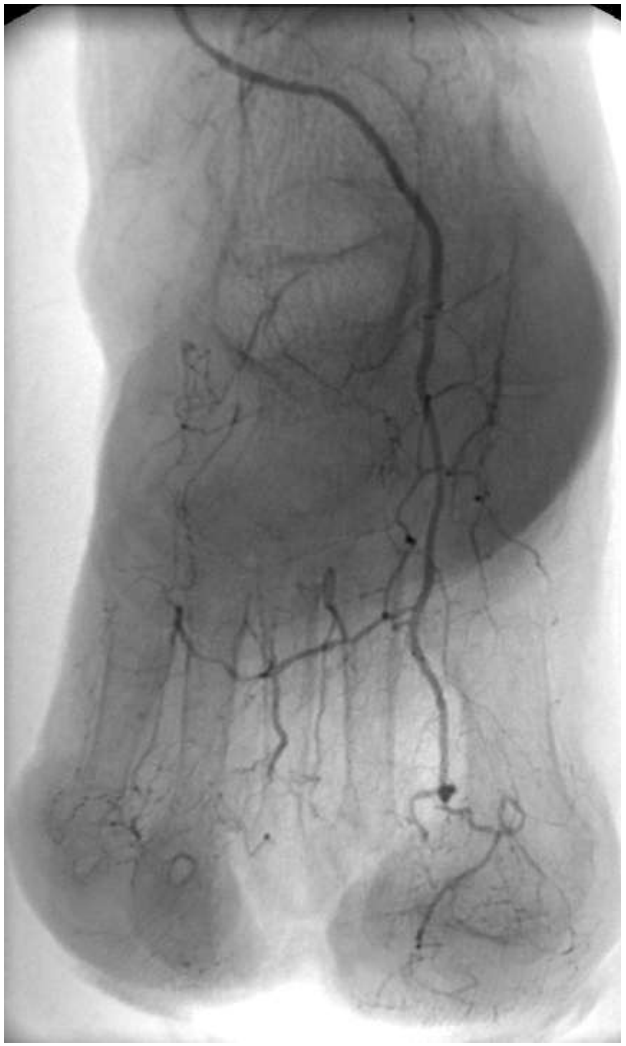







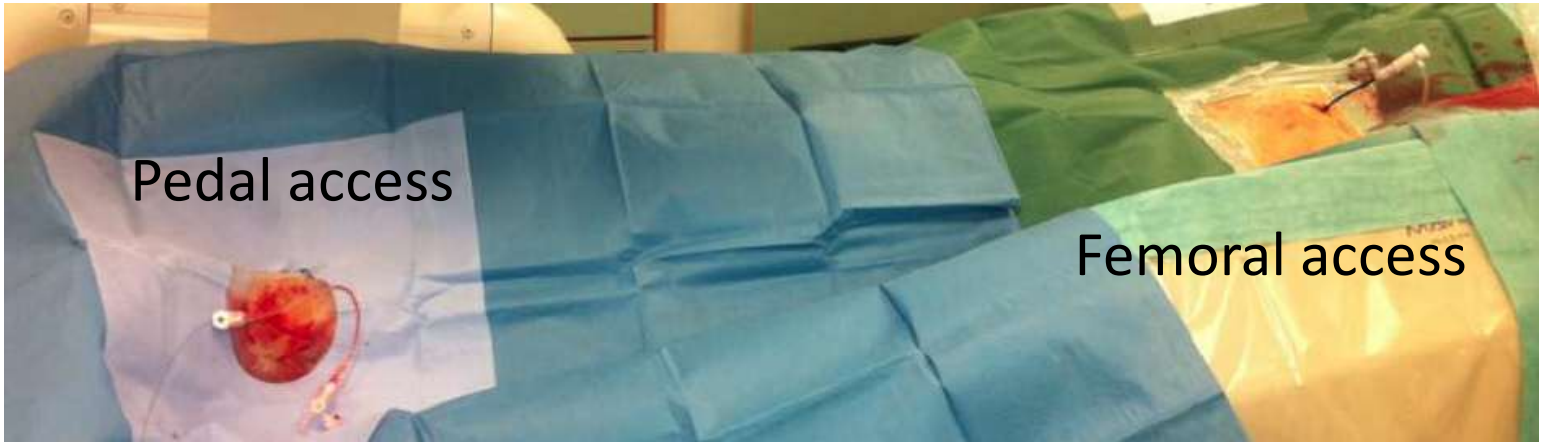
Guide CTO 0.014



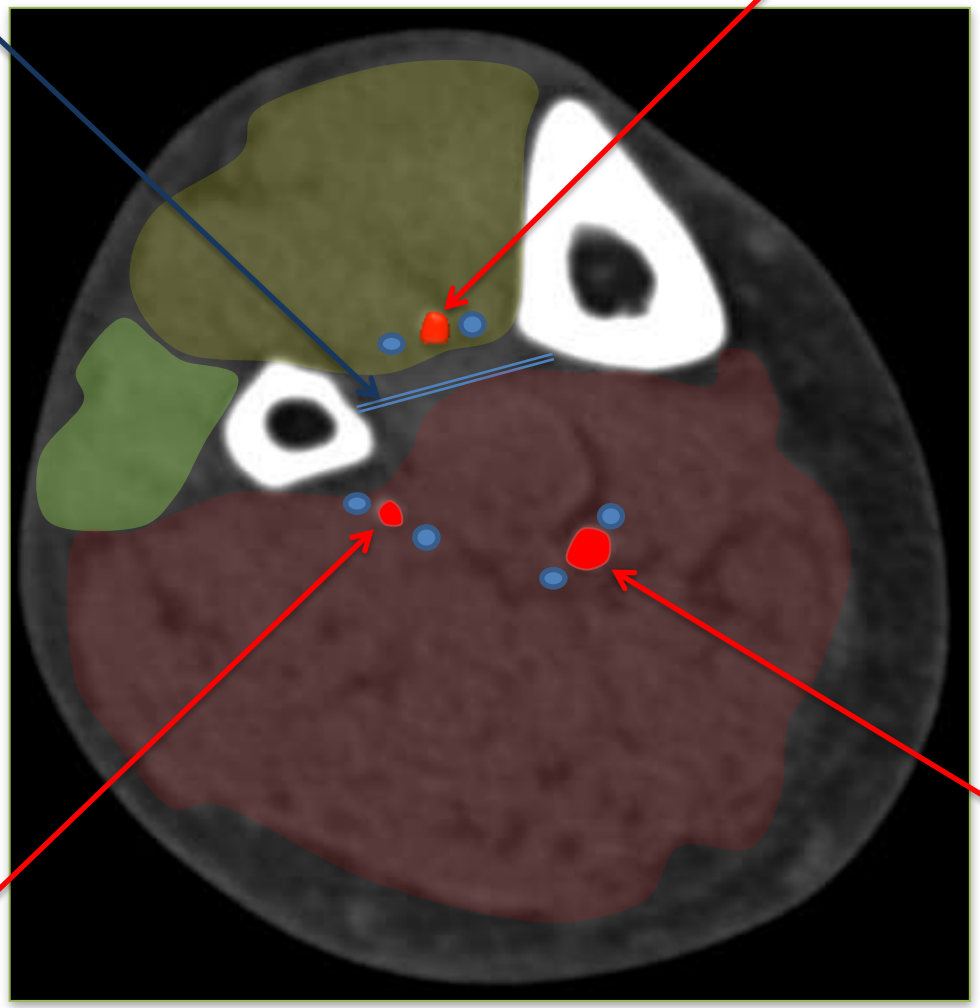


Abord rétrograde

Double abord antegrade et retro

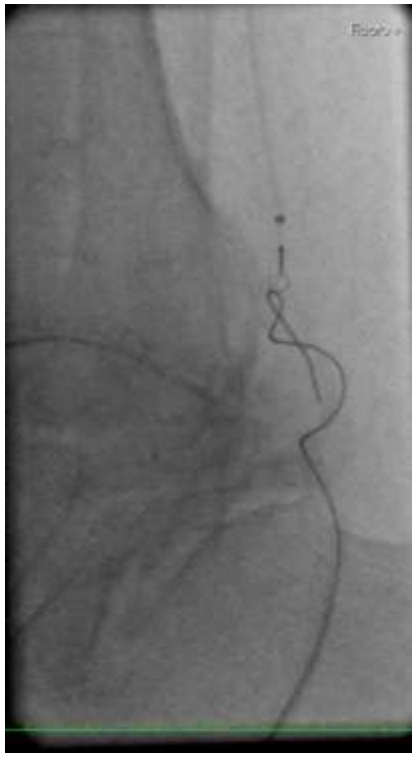


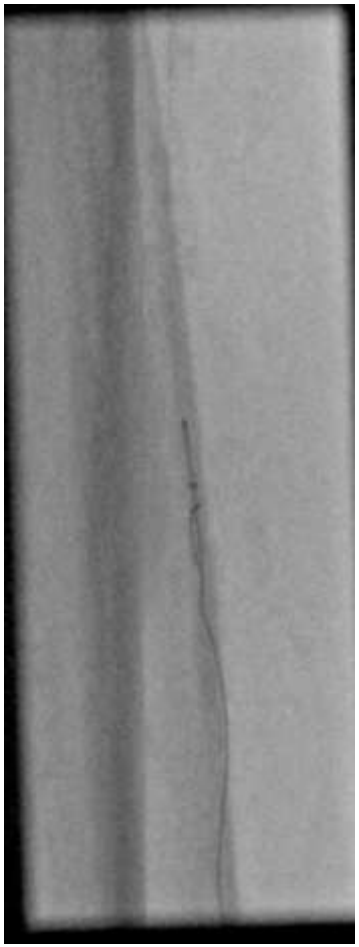
Abord rétrograde

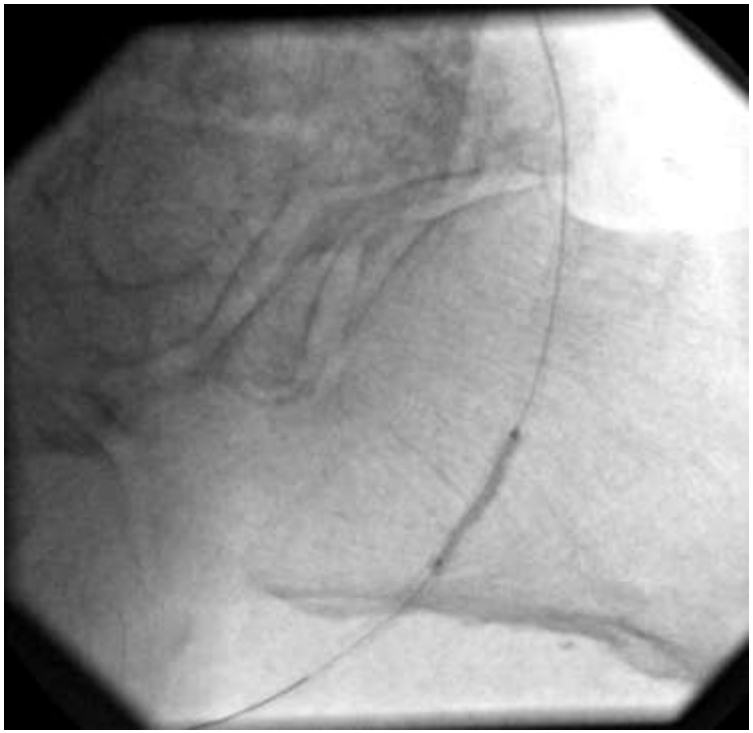


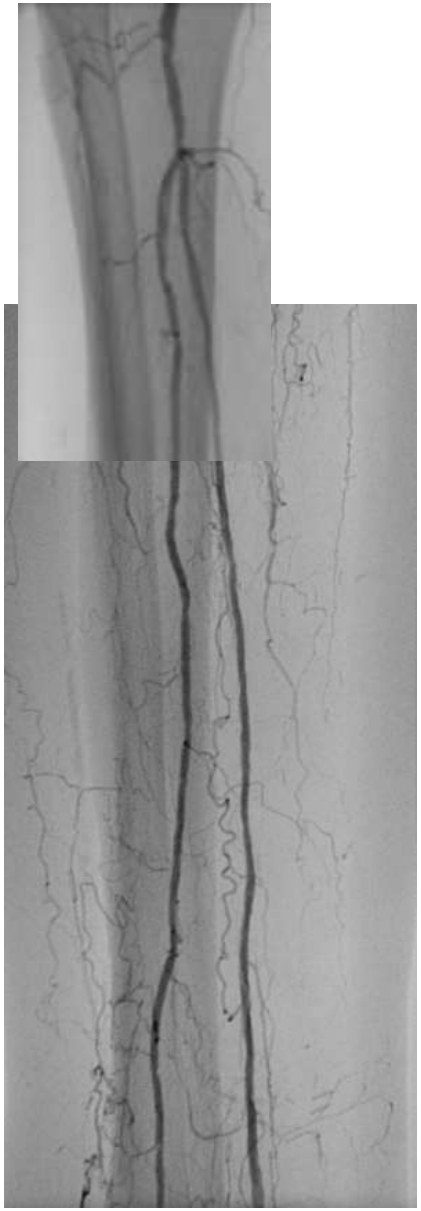
MR JP. H. 87 ans
Diabète
IAMI stade IV O1

Retrograde approach via PTA







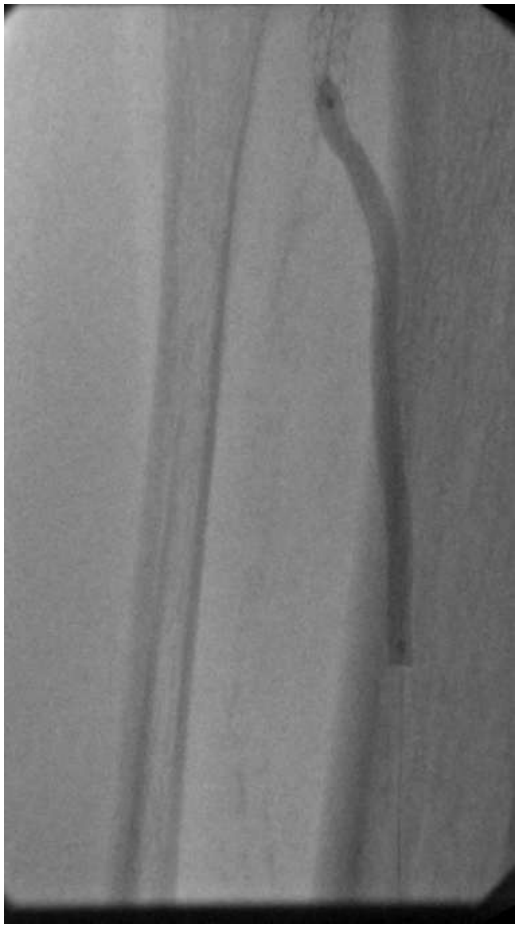


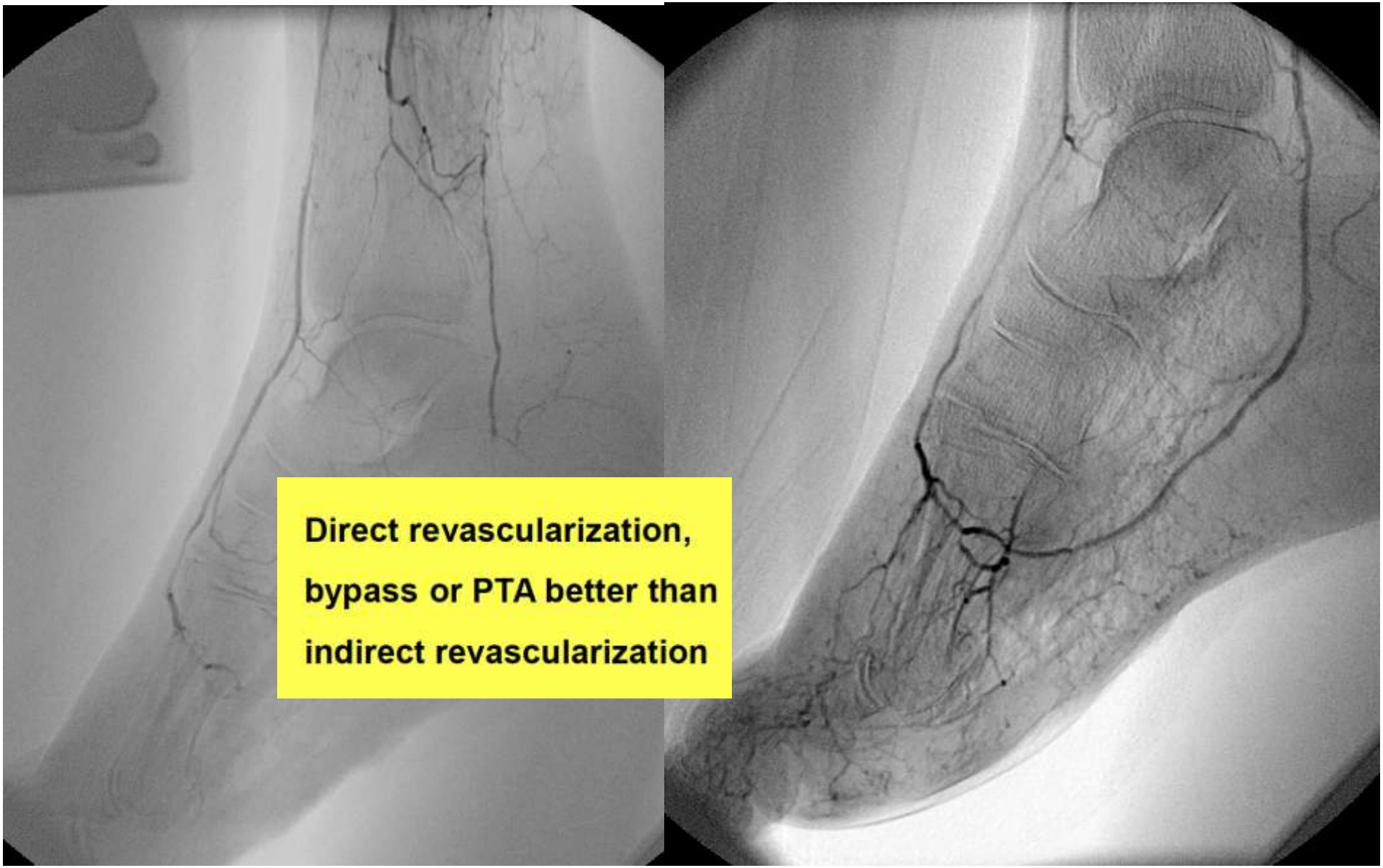
Mme R.O. 74 ans
diabète
IAMI stade IV sur le 5eme rayon

« Pied désertique »

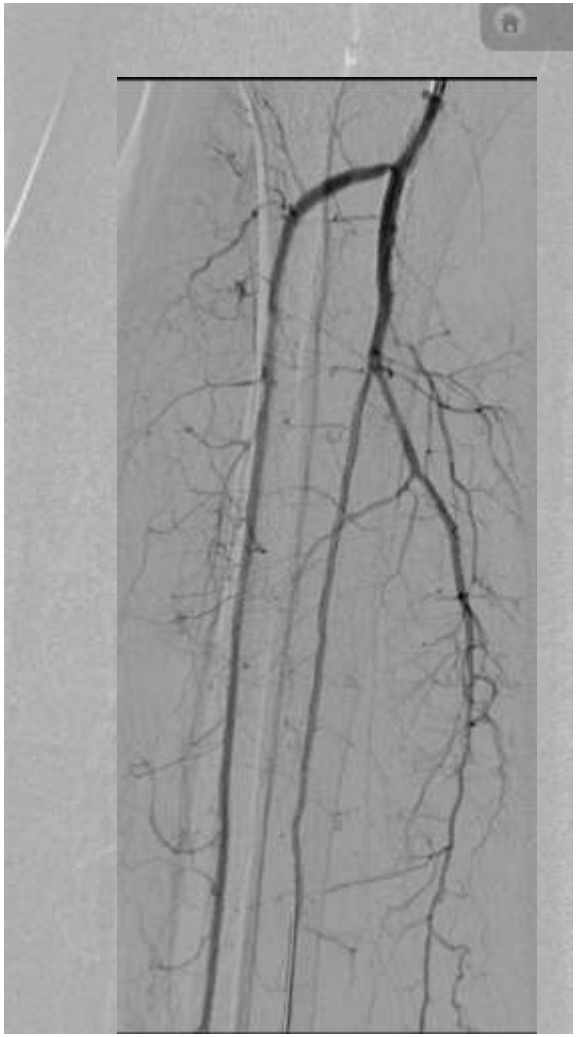


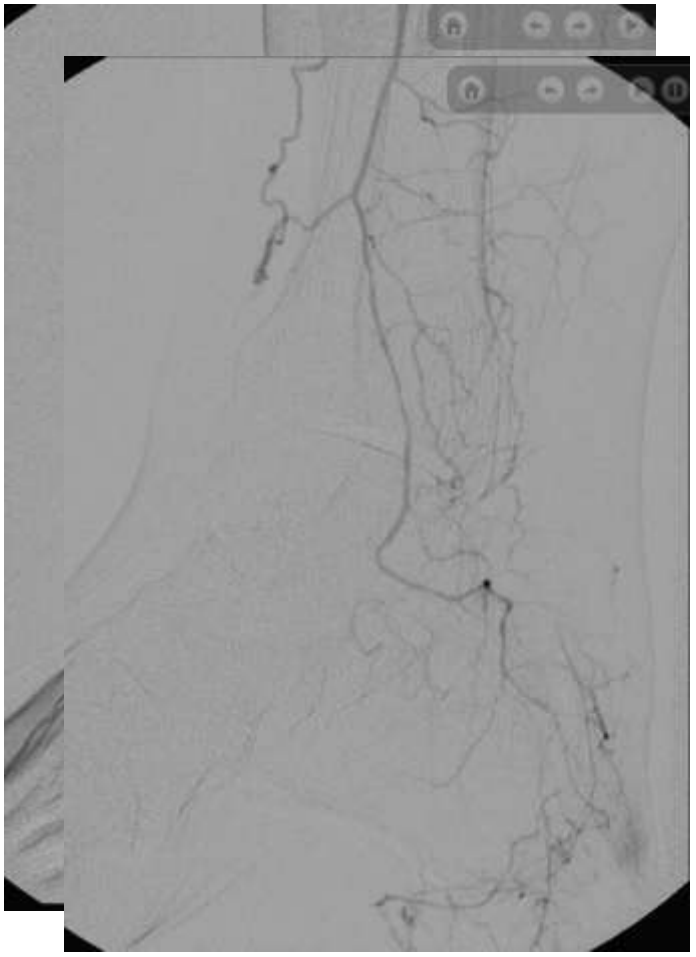
Amputation à minima




Direct revascularization,
bypass or PTA better than
indirect revascularization

Mr R.A. 59 ans
diabète
IAMI stade IV Ostéite du talon



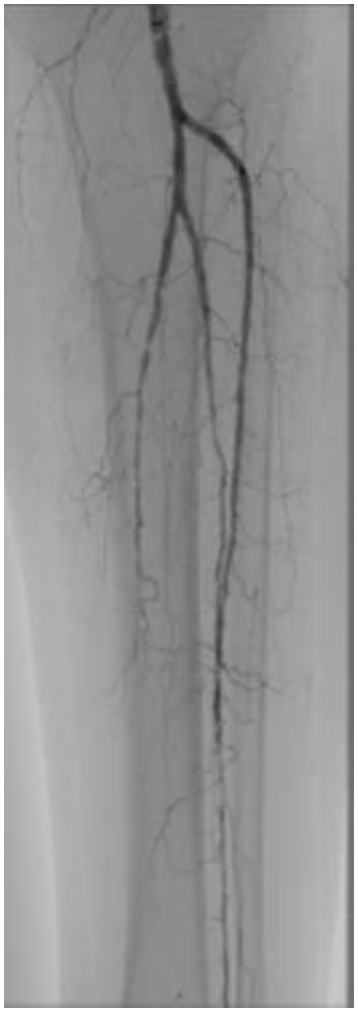


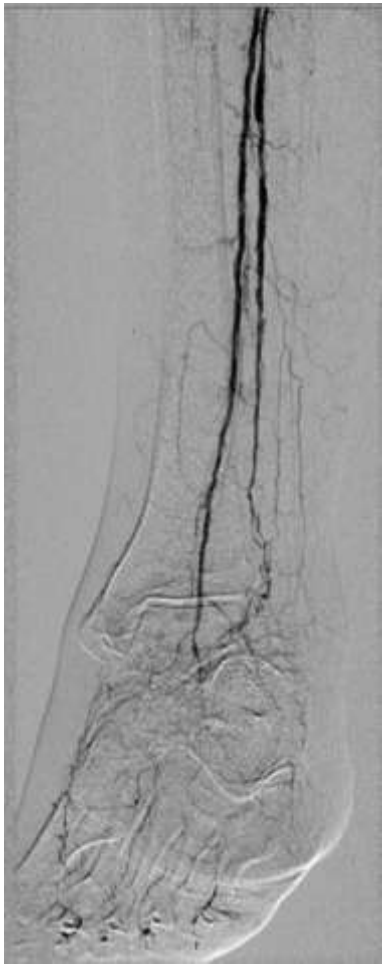
A propos d’un patient diabétique Oranais

(Deux tentatives échouées en clinique à Toulouse)

- Mr E A-H 1946

13.02.2017



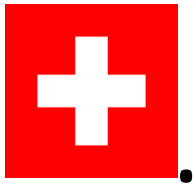


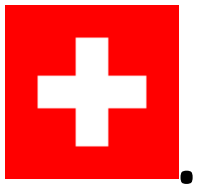
06.04.2017

Questions et commentaires……

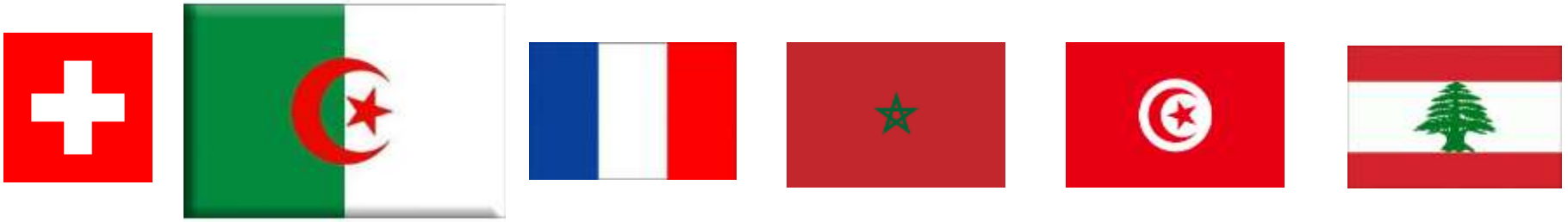
- Combien dure ces l'interventions complexes de revascularisation distales?
- Taux d'échec de procédure?

- ….mais vous, vous êtes en Suisse !!!





- Apprentissage
- Volonté



- Salles de cath (institutions publics ou privés)
- Opérateurs entrainés (centres de formations)
- Moyens de matériel d’angioplastie (firmes)
- **Couverture Assurance maladie CNAS**

Photo by Jesper Westley

Conclusion I

- Le diabète, maladie endémique dans notre pays, engendre un **trop grand nombre d'amputation majeure**.
- La formation des thérapeutes vasculaires (chirurgiens ou radiologues) doit se développer et des centres de prise en charge doivent être créés afin de répondre aux besoins de la population diabétique.

Conclusion II

- La prise en charge du pied diabétique en ischémie critique doit suivre un protocole **strict**.
    - Time is Tissue

- Le travail complémentaire en équipe **pluri-disciplinaire** est un gage de qualité de la prise en charge du patient depuis le diagnostic jusqu'à la guérison.

Chirurgien Ortho

Rx Interv/ Chir Vasc

Néphrologue

Infectiologue

Diabétologue

Plasticien

Cardiologue

Merci pour votre attention.