



◆ CLINICAL INVESTIGATION

## Subintimal Angioplasty for Below-the-Ankle Arterial Occlusions in Diabetic Patients With Chronic Critical Limb Ischemia

Yue-Qi Zhu, MD, PhD<sup>1</sup>; Jun-Gong Zhao, MD, PhD<sup>1</sup>; Fang Liu, MD<sup>2</sup>; Jian-Bo Wang, MD, PhD<sup>1</sup>; Ying-Sheng Cheng, MD, PhD<sup>3</sup>; Ming-Hua Li, MD, PhD<sup>1</sup>; Jue Wang, MD<sup>1</sup>; and Jie Li, MD<sup>1</sup>

Departments of <sup>1</sup>Radiology and <sup>2</sup>Endocrinology, The Sixth Affiliated People's Hospital, Medical School of Shanghai Jiao Tong University, Shanghai, China.

<sup>3</sup>Department of Radiology, The Tenth Affiliated People's Hospital, Shanghai Tong Ji University, Shanghai, China.

### Procedure details (n=57)

#### Procedures/limb

|   |            |
|---|------------|
| 1 | 53 (93.0%) |
| 2 | 4 (7.0%)   |

#### Technical success

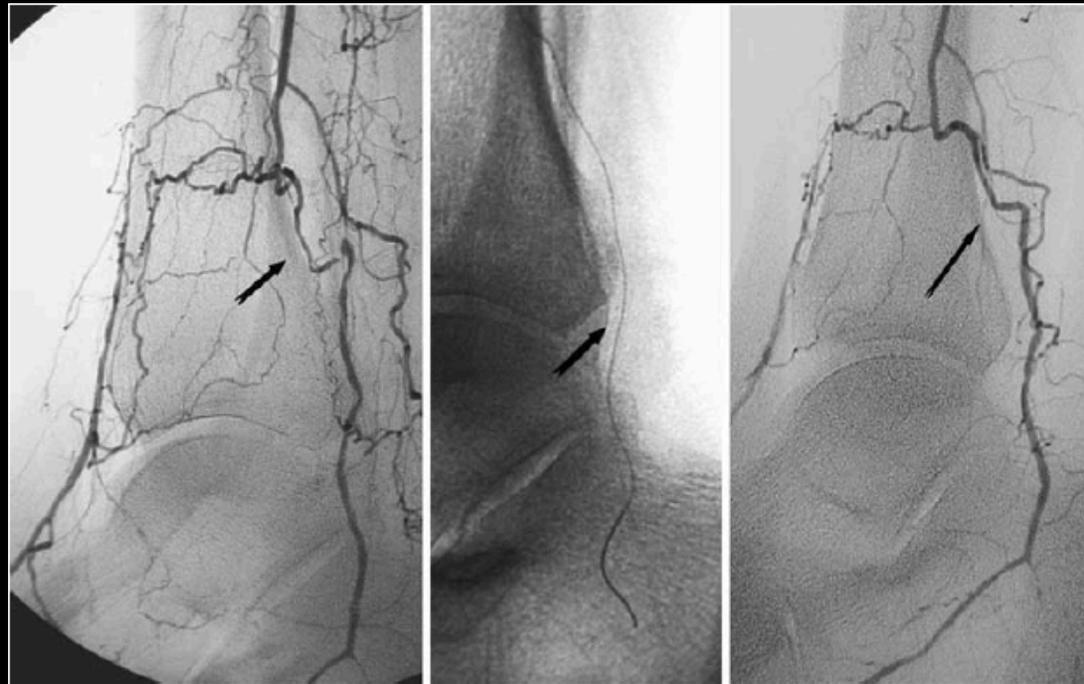
|                                   |               |
|-----------------------------------|---------------|
| Anterior DPA                      | 7/8 (87.5%)   |
| Posterior DPA                     | 1/2 (50.0%)   |
| Anterior DPA and ATA              | 37/45 (82.2%) |
| Posterior DPA and PTA             | 7/8 (87.5%)   |
| Posterior DPA and peroneal artery | 3/3 (100%)    |



## Transluminal Angioplasty of Peroneal Artery Branches in Diabetics: Initial Technical Experience

Lanfroi Graziani · Antonio Silvestro · Luca Monge · Gian Mario Boffano ·  
Francesco Kokaly · Ilaria Casadidio · Francesco Giannini

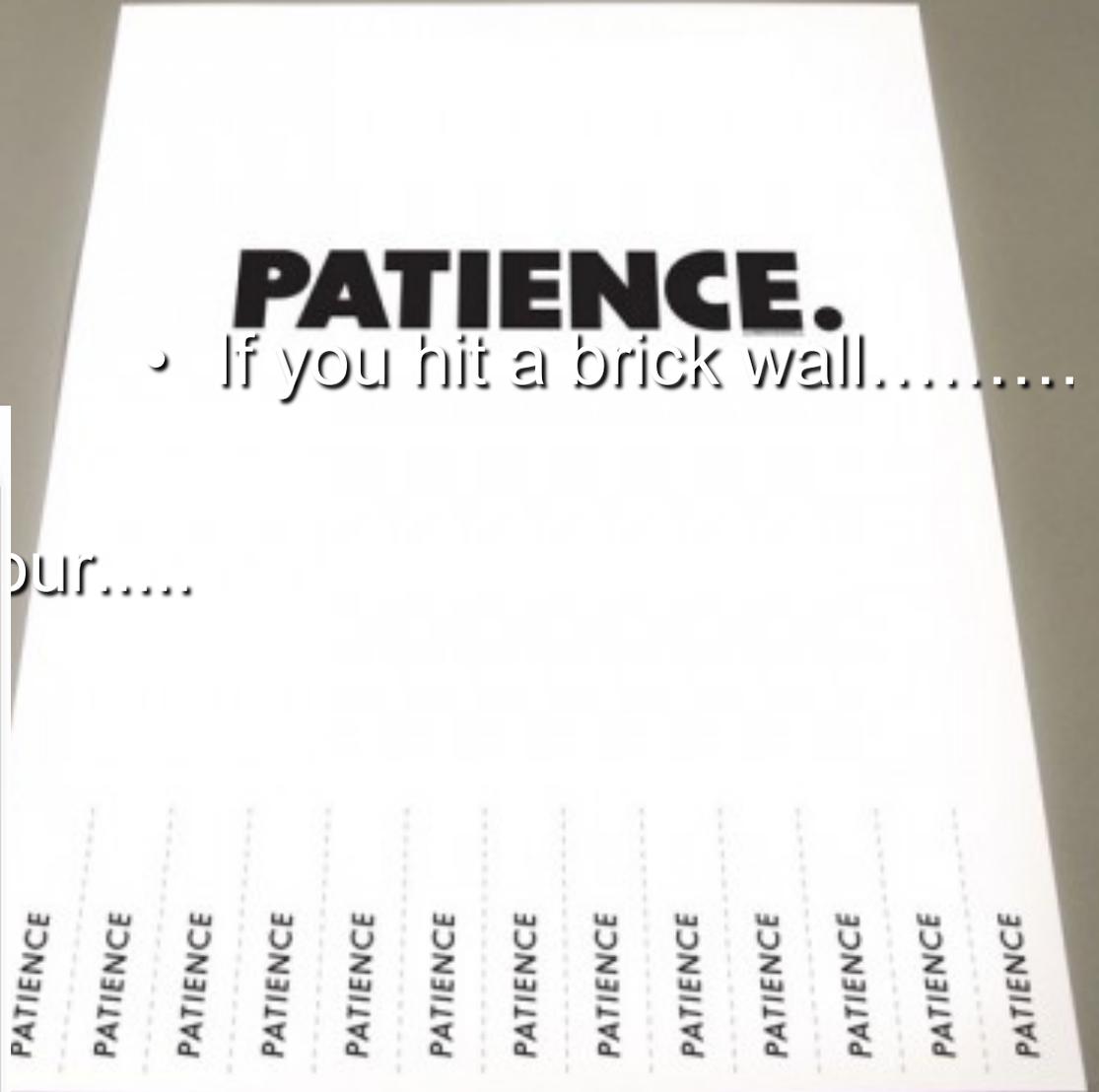
Received: 15 March 2007 / Accepted: 27 June 2007 / Published online: 25 October 2007  
© Springer Science+Business Media, LLC 2007



- Just be patient.....

- If you hit a brick wall.....

our.....



*Clinical results of below-the knee intervention  
using pedal-plantar loop technique  
for the revascularization of foot arteries*

M. MANZI<sup>1</sup>, M. FUSARO<sup>2</sup>, T. CECCACCI<sup>1</sup>, G. ERENTE<sup>1</sup>, L. DALLA PAOLA<sup>3</sup>, E. BROCCO<sup>3</sup>

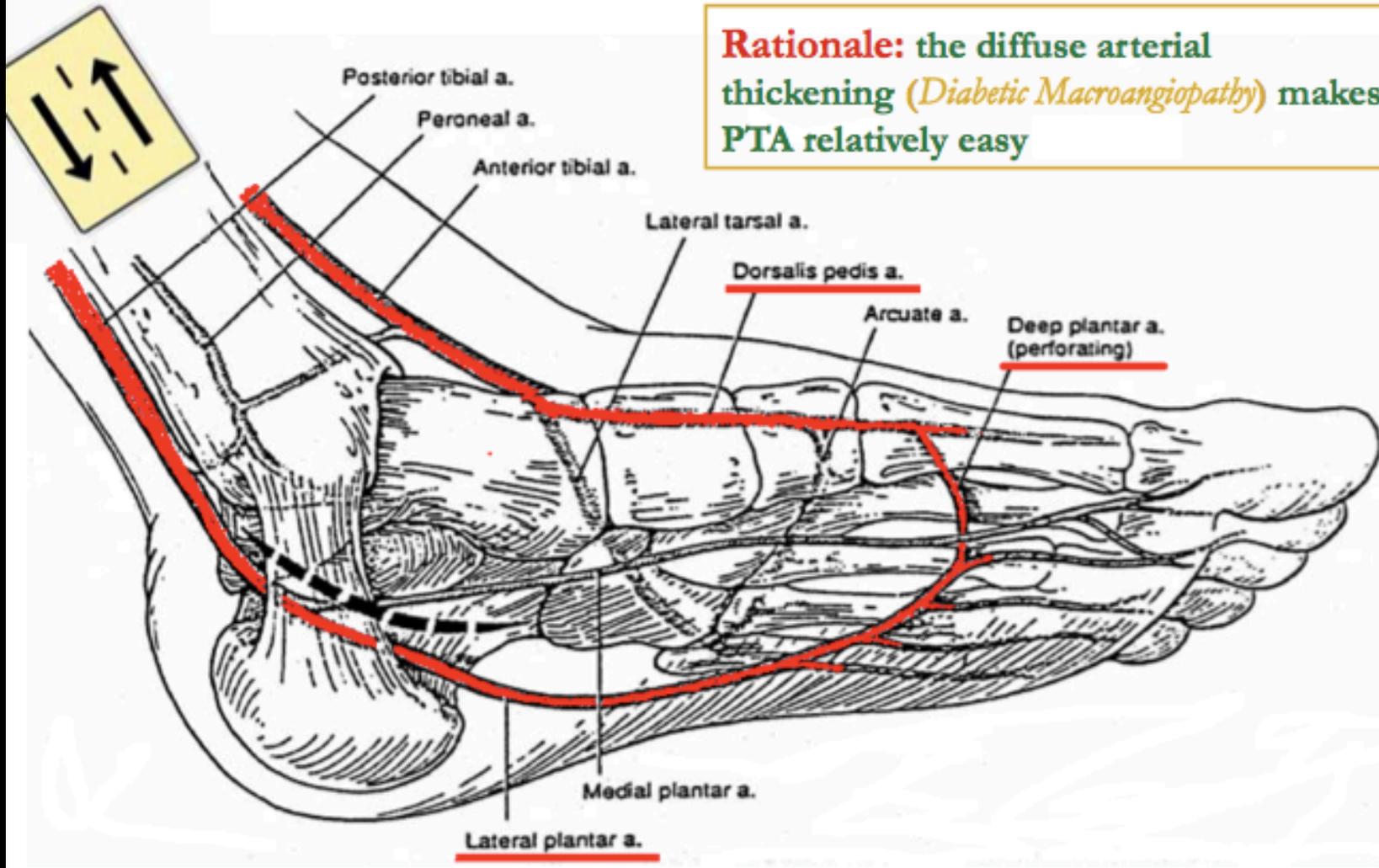
Table III.—*Angiographic and procedural characteristics of patients approached with the pedal-plantar loop technique.*

| Patients   | N=114                |
|--|----------------------|
| <b>Location of treated lesion</b>                                |                      |
| Anterior tibial artery   | 86-74.8%             |
| Tibio-peroneal trunk   | 10-8.7%              |
| Peroneal artery  | 15 13.3% (2 missing) |
| Posterior tibial artery  | 74-64.9% (1 missing) |
| Pedal artery   | 52-54.2%             |
| Plantar artery   | 60-52.2%             |
| Concomitant treatment of superficial femoral or popliteal artery | 60-52.2%             |
| Acute success  | 115 (100.0%)         |



# The Plantar Arch: a Two-Way Route

**Rationale:** the diffuse arterial thickening (*Diabetic Macroangiopathy*) makes PTA relatively easy



Manzi M. et al., J Cardiovasc Surgery 2009;50:331-7.

Rot -22°  
Ang +0°  
FD 37 cm



□ 0:00  
MM 9:54:24

12  
1

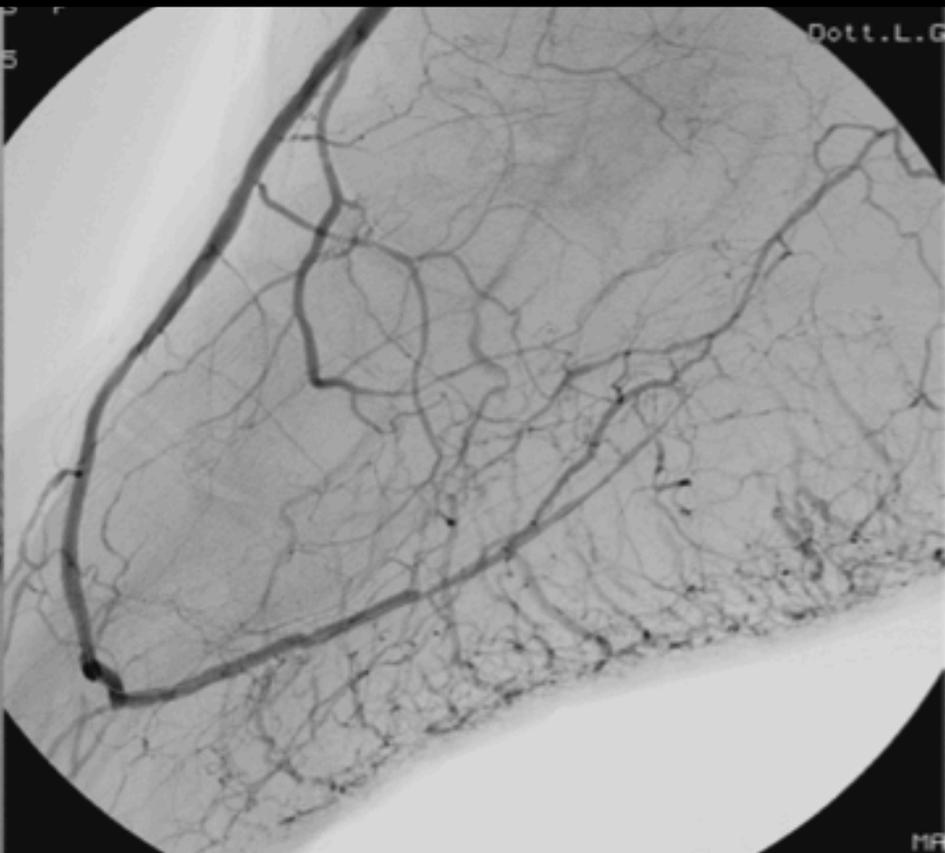


CR933 F  
S  
005

Dot







3°  
0°  
m



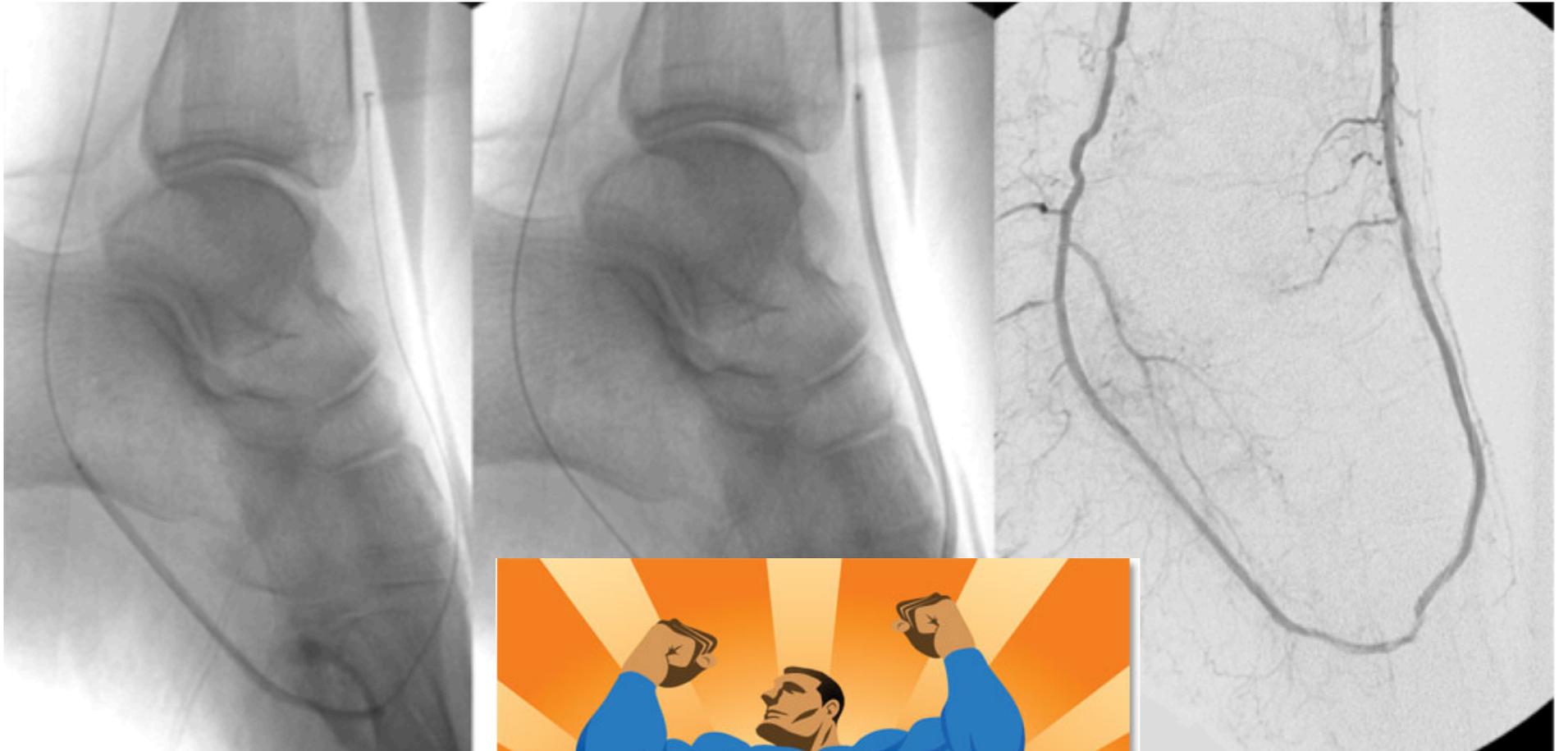
Rot -13°  
Ang +0°  
FD 48 cm

□ 0:00  
⏮ 10:45:58



2

:18



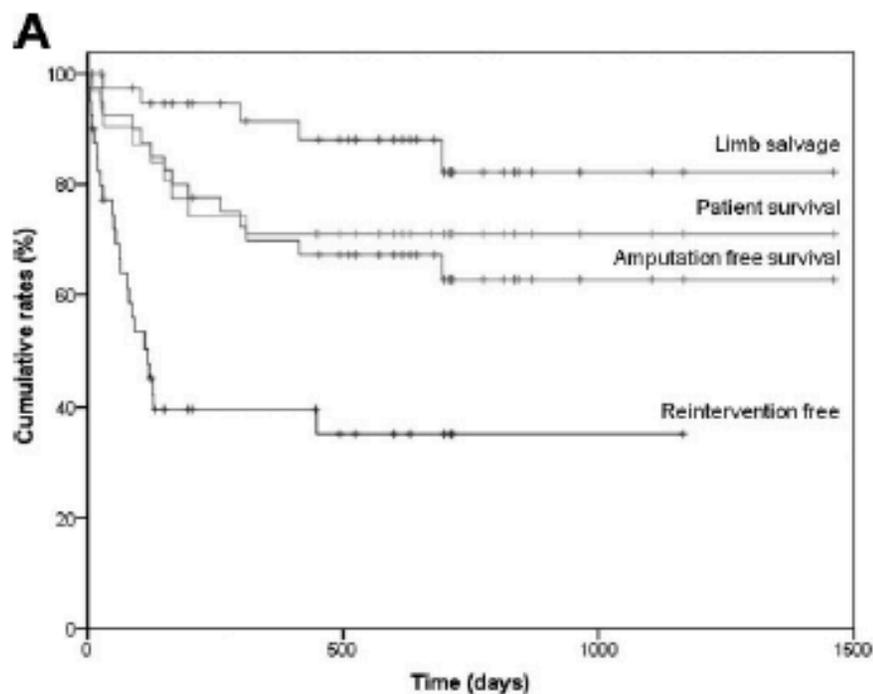
◆ CLINICAL INVESTIGATION ◆

## **Stent-Assisted Below-the-Ankle Angioplasty for Limb Salvage**

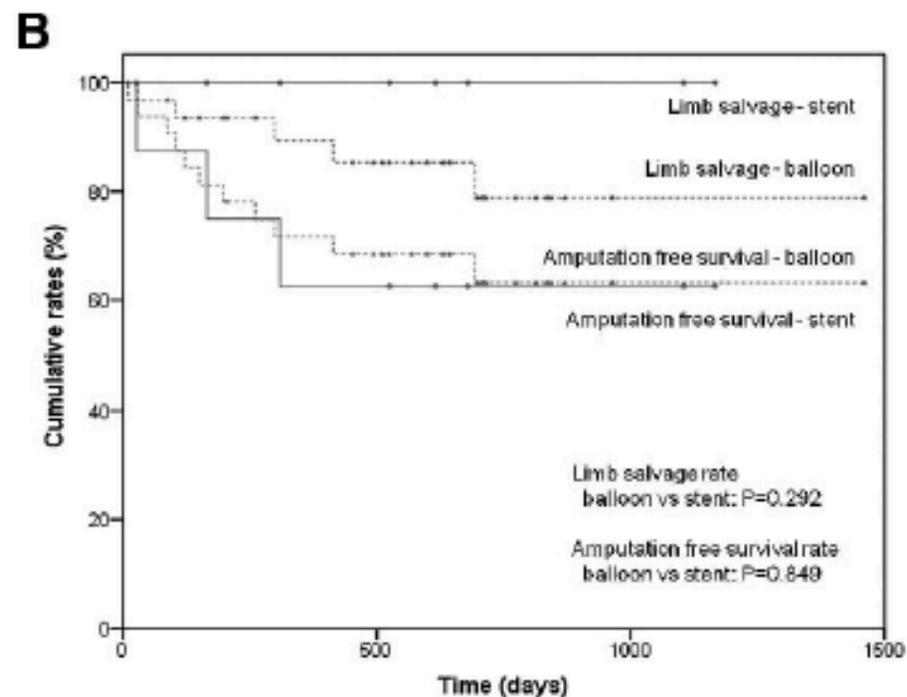
**Osami Kawarada, MD<sup>1,2</sup>; Yoshiaki Yokoi, MD, PhD<sup>1</sup>; Akihiro Higashimori, MD<sup>1</sup>; Naoto Waratani, MT<sup>1</sup>; Katsuhisa Waseda, MD, PhD<sup>2</sup>; Yasuhiro Honda, MD<sup>2</sup>; and Peter J. Fitzgerald, MD, PhD<sup>2</sup>**

<sup>1</sup>Department of Cardiology, Kishiwada Tokushukai Hospital, Kishiwada-city, Osaka, Japan. <sup>2</sup>Center for Cardiovascular Technology, Division of Cardiovascular Medicine, Stanford University Medical Center, Stanford, California, USA.





| Months      |                          | 6    | 12   | 24   | 36   | 48   |
|-------------|--------------------------|------|------|------|------|------|
| No. at risk | Reintervention free      | 12   | 10   | 1    | 1    | 0    |
|             | Amputation free survival | 32   | 27   | 9    | 3    | 1    |
|             | Patient survival         | 24   | 22   | 9    | 4    | 1    |
|             | Limb salvage             | 32   | 27   | 9    | 3    | 1    |
| Rate (%)    | Reintervention free      | 39.6 | 39.6 | 35.2 | 35.2 | 35.2 |
|             | Amputation free survival | 80   | 89.7 | 82.7 | 82.7 | 82.7 |
|             | Patient survival         | 77.4 | 71   | 71   | 71   | 71   |
|             | Limb salvage             | 84.7 | 91.4 | 82.1 | 82.1 | 82.1 |

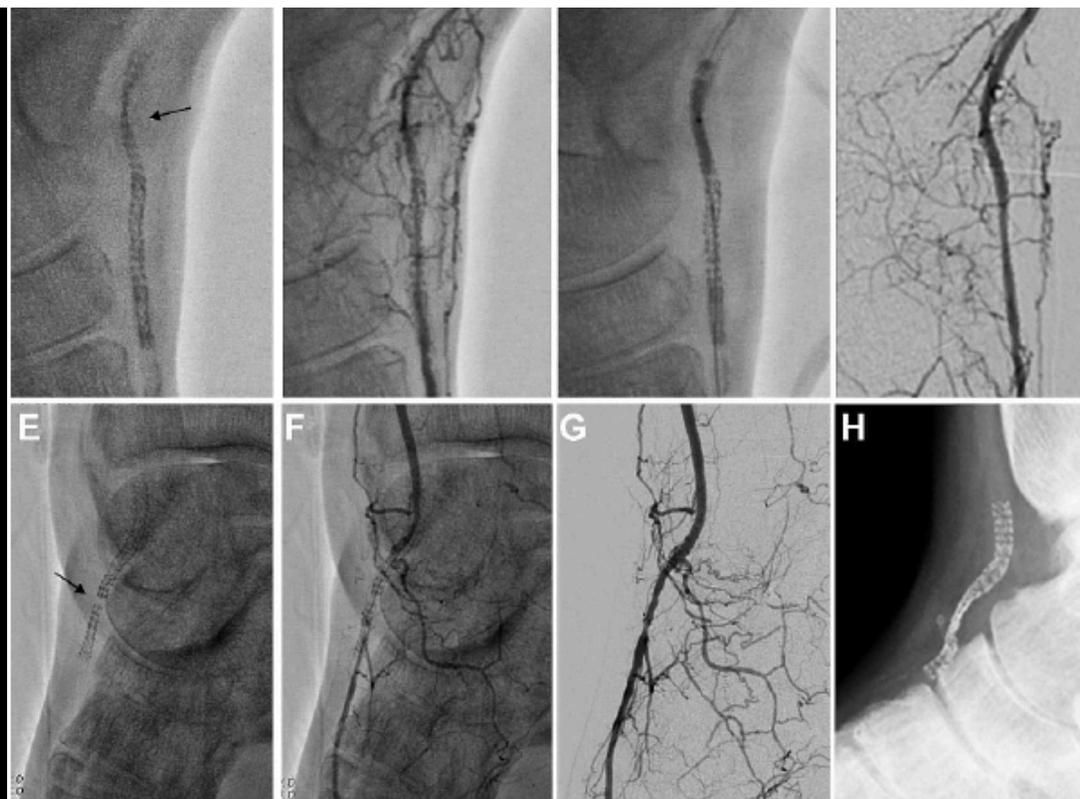


| Months      |                       | 6    | 12   | 24   | 36   | 48   |
|-------------|-----------------------|------|------|------|------|------|
| No. at risk | AFS: balloon          | 26   | 22   | 7    | 1    | 1    |
|             | AFS: stent            | 6    | 5    | 2    | 2    | 0    |
|             | Limb salvage: balloon | 26   | 22   | 7    | 1    | 1    |
|             | Limb salvage: stent   | 6    | 3    | 2    | 2    | 0    |
| Rate (%)    | AFS: balloon          | 81.3 | 71.6 | 83.1 | 83.1 | 83.1 |
|             | AFS: stent            | 75   | 62.5 | 62.5 | 62.5 | 62.5 |
|             | Limb salvage: balloon | 93.4 | 89.4 | 78.7 | 78.7 | 78.7 |
|             | Limb salvage: stent   | 100  | 100  | 100  | 100  | 100  |

Figure 3 (A) Kaplan-Meier life table analysis of clinical outcomes after stent-assisted

**TABLE 2**  
Dorsalis Pedis Artery Stenting Cases

|   | Side  | Number of Stents/ Location* | Calcification | Stent Compression | Stent Fracture      | Repeat Intervention |
|---|-------|-----------------------------|---------------|-------------------|---------------------|---------------------|
| 1 | Right | 2/D-1, 2, 3                 | Mild          | Partial           | Complete separation | Yes                 |
| 2 | Right | 1/D-1, 2                    | Severe        | Complete          | Partial separation  | No                  |
| 3 | Left  | 3/D-1, 2, 3                 | Severe        | Partial           | Partial separation  | Yes                 |
| 4 | Left  | 1/D-1                       | —             | NA                | NA                  | No                  |
| 5 | Left  | 3/D-1, 2, 3                 | —             | —                 | Partial subluxation | Yes                 |
| 6 | Left  | 1/D-1, 2                    | Moderate      | Partial           | —                   | No                  |
| 7 | Left  | 1/D-1, 2                    | Moderate      | Partial           | —                   | Yes                 |
| 8 | Right | 1/D-1                       | Severe        | —                 | Partial subluxation | No                  |



# Summary

- With better experience and improved technology, pedal interventions will become more common in the treatment of CLI
- The technology is in its infancy but more cases are technically feasible
- Outcomes will improve in the future that will affect limb salvage rates



Thank you



# Truths in BTK Therapy

## Evidence Level A

*"In patients presenting with severe limb ischaemia due to infra-inguinal disease and who are suitable for surgery and angioplasty, a bypass-surgery-first and a balloon-angioplasty-first strategy are associated with broadly similar outcomes in terms of amputation-free survival ....."*

**Basil trial participants, Lancet 2005; 366: 1925–1934**

*"There is increasing evidence to support a recommendation for angioplasty in patients with CLI and infrapopliteal artery occlusion where in-line flow to the foot can be re-established and where there is medical co-morbidity."*



**Endovascular first in CLI!**

# Missings in BTK Therapy

*There are as many missings as there is innovation !*



## Current missings:

- ✓ Maximum BTK revascularization or one straight line flow ?
- ✓ Which device(s) for which lesion(s) ?
- ✓ Primary BTK stenting or POBA ?
- ✓ Balloon- or self-expandable stents ?
- ✓ Drug-eluting balloon PTA or POBA ?
- ✓ Biomechanics of infrageniculate arteries ???