# Optimal Treatment for Below-The-Knee Lesions

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# Critical Limb Ischemia

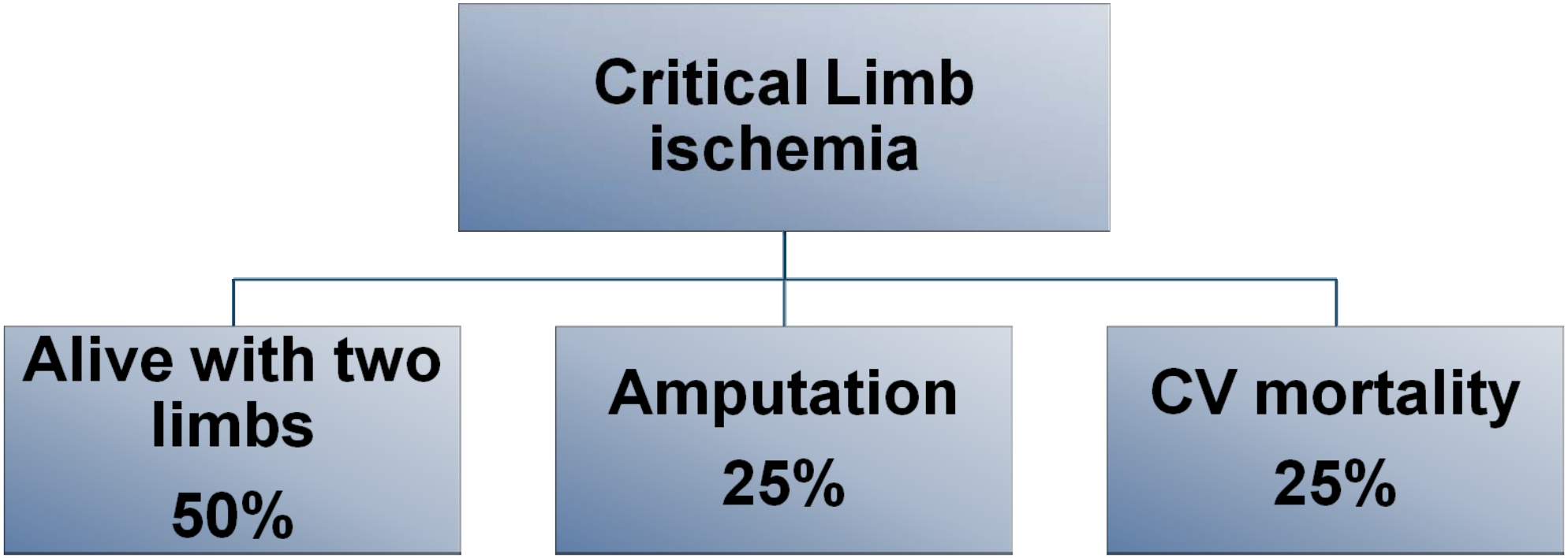
- Definition:
  - chronic ischemic rest pain, ulcers or gangrene attributable to objectively proven arterial occlusive disease

- Other causes of pain should be considered, if ankle pressure >50 mmHg

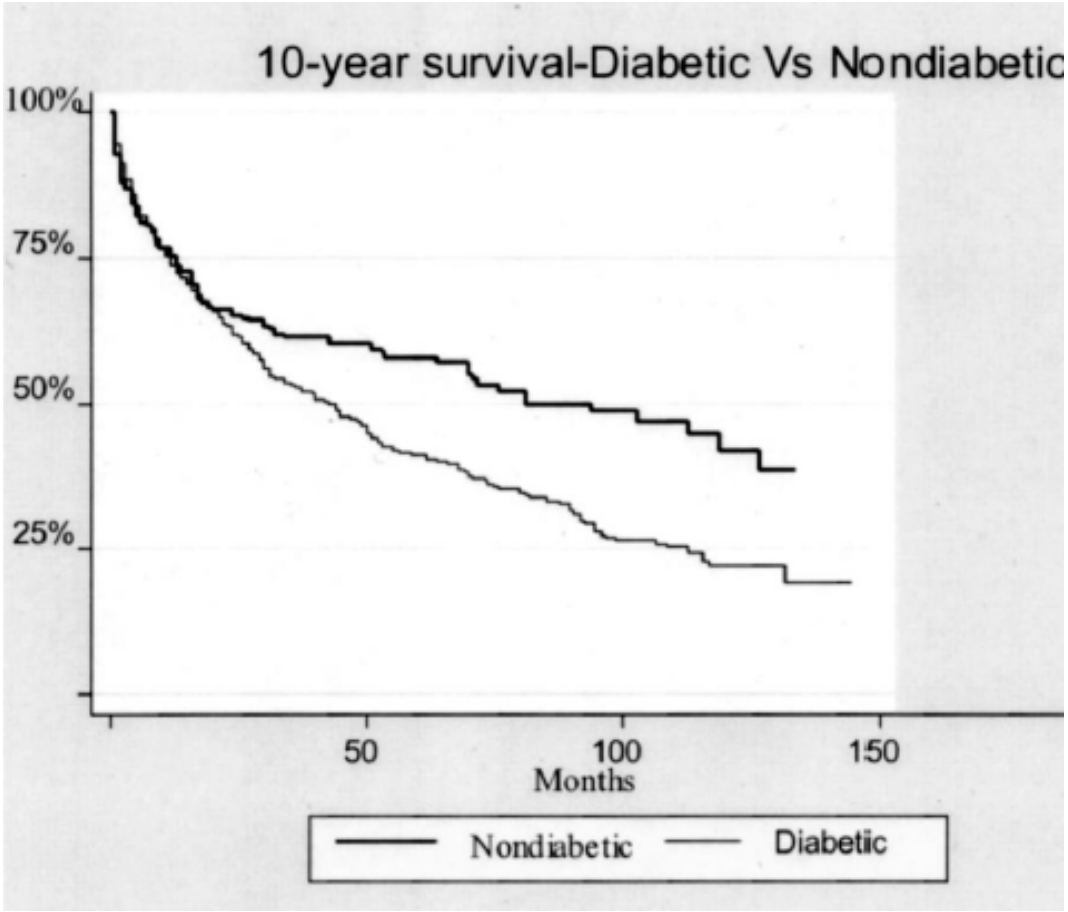
# Critical Limb Ischemia

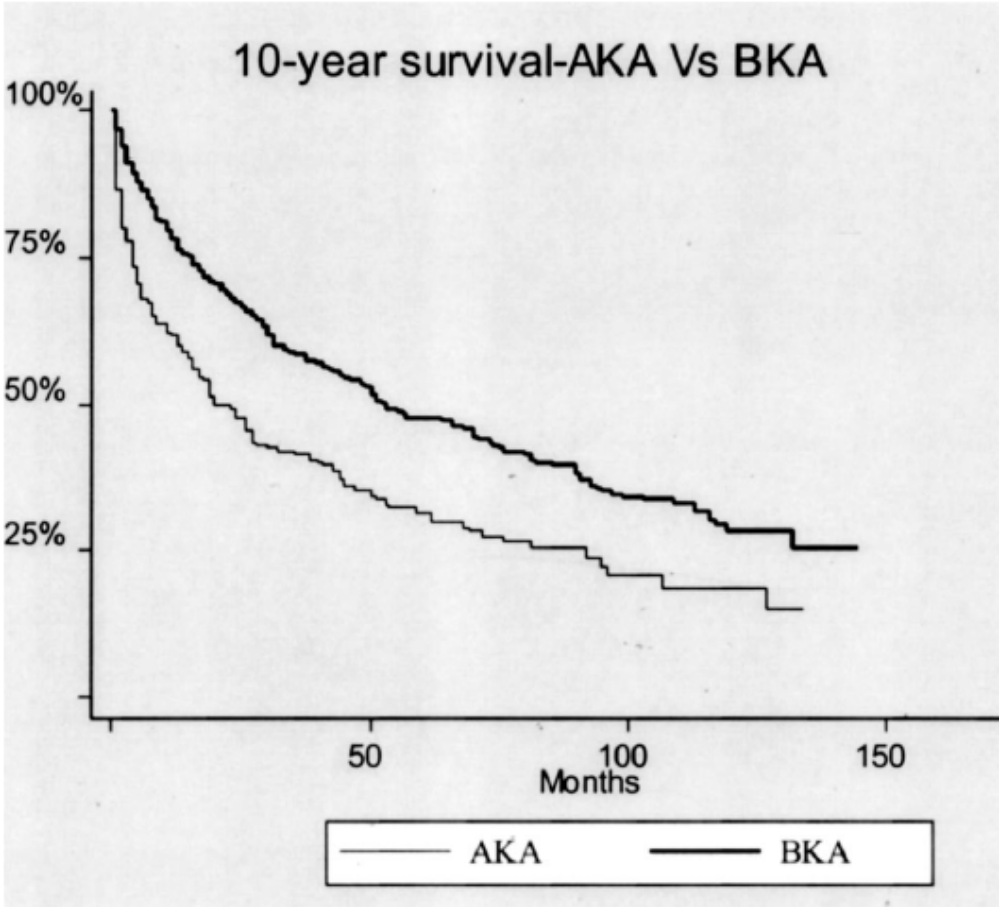
- Characterized by
  - Occlusive rather stenotic lesions
  - Diffuse, long lesions
  - Multilevel lesions
  - Infrapopliteal lesions

# 1-Year Outcome of CLI



# Survival of Amputees




*Subramaniam B, Anesth Analg 2005;100:1241–7*

# Indications of BTK Interventions

- Patients with critical limb ischemia for limb salvage
- Controversial: Patients with intermittent claudication for improvement of outflow

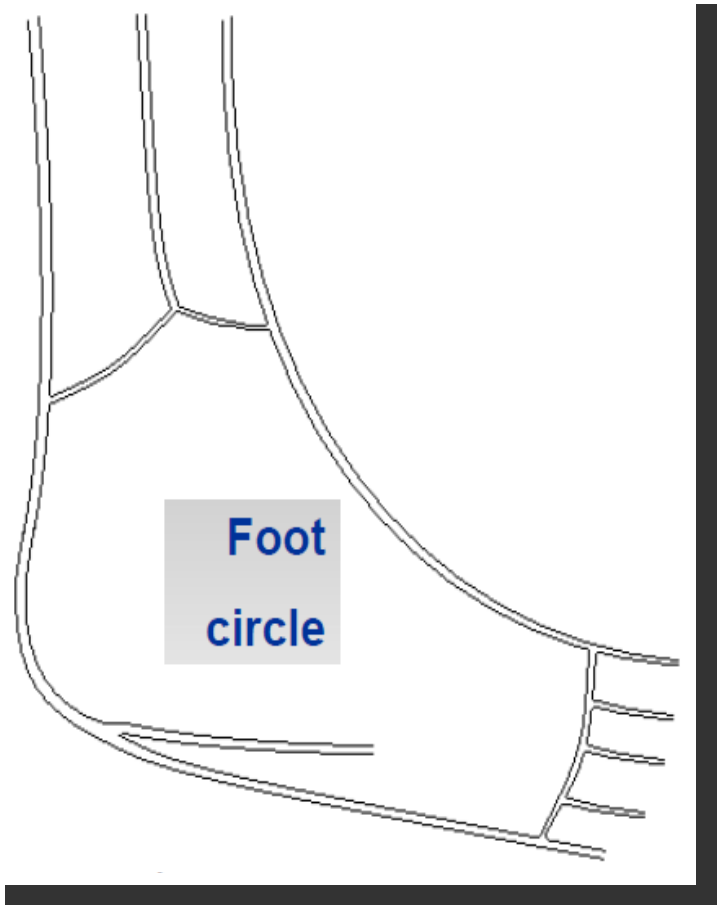
# Clinical Goals

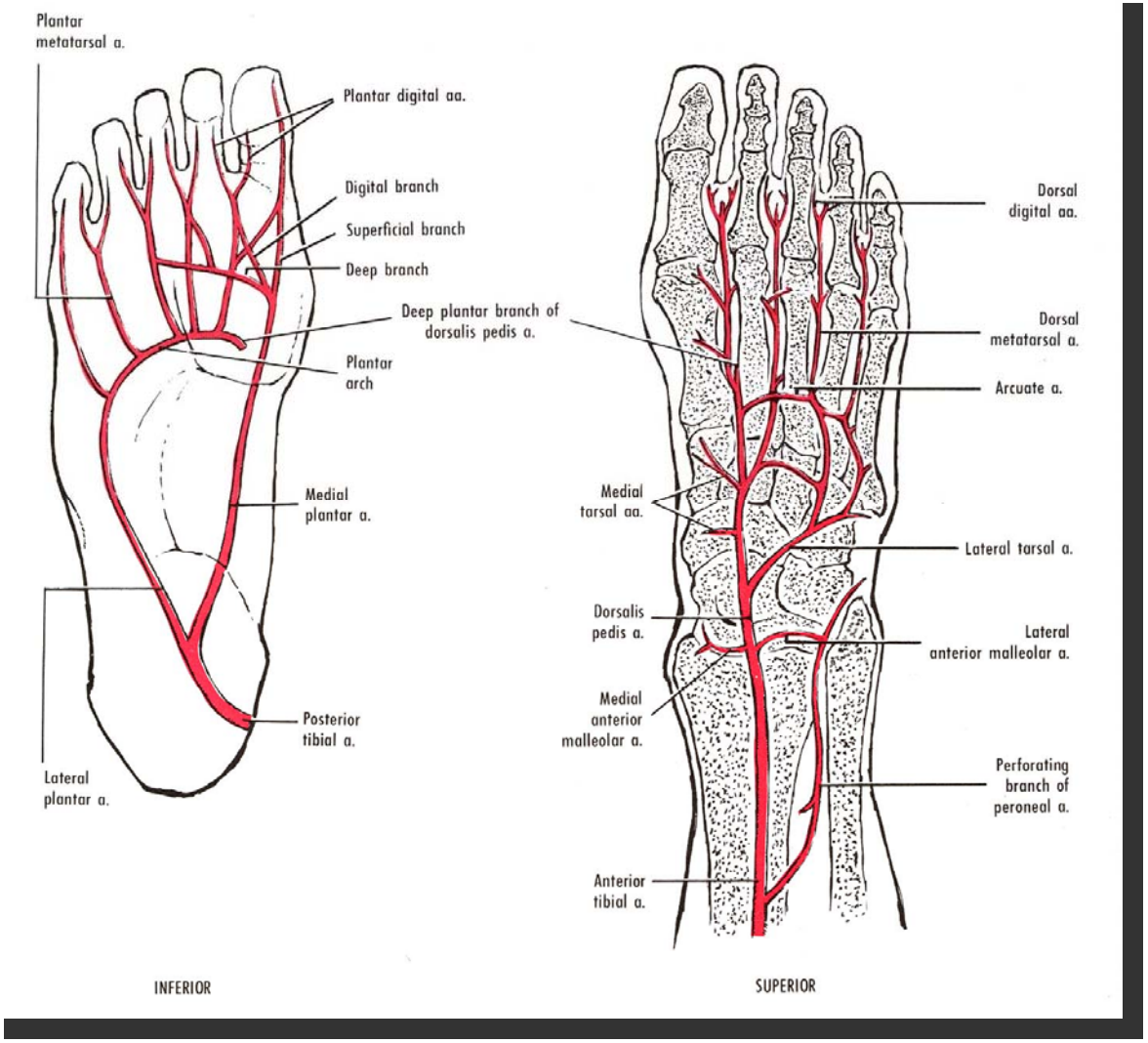
- Limb salvage
- Better wound healing
- Pain relief
- Early mobilization

# Interventional Targets

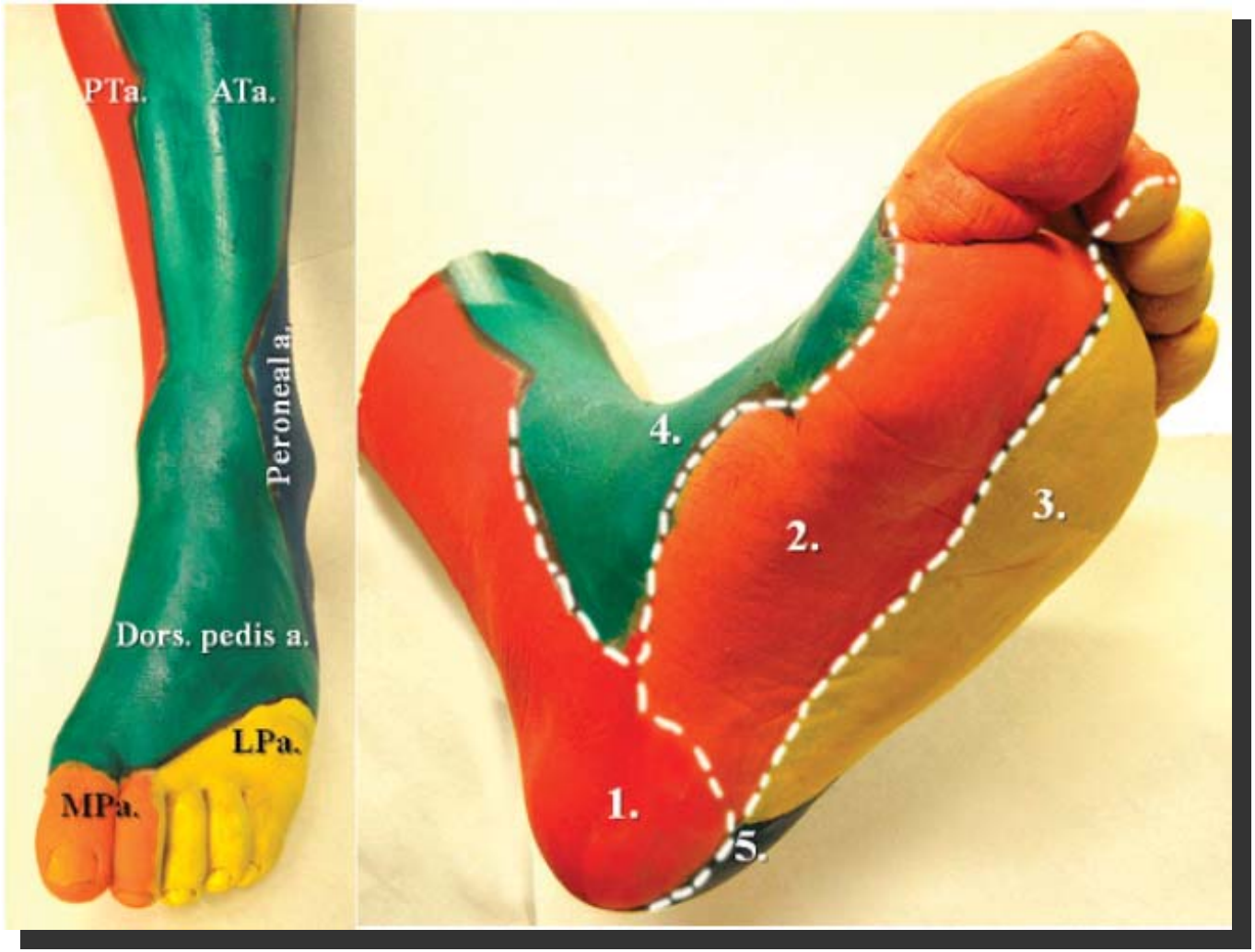
- Improve in-flow
- Restore straight line blood flow
- Restore foot circle
- Direct blood flow to the wound area

# Foot Circle


Foot
circle


Plantar metatarsal a.
Plantar digital aa.
Digital branch
Superficial branch
Deep branch
Deep plantar branch of dorsalis pedis a.
Plantar arch
Medial plantar a.
Posterior tibial a.
Lateral plantar a.
INFERIOR
Dorsal digital aa.
Dorsal metatarsal a.
Arcuate a.
Medial tarsal aa.
Lateral tarsal a.
Dorsalis pedis a.
Lateral anterior malleolar a.
Medial anterior malleolar a.
Perforating branch of peroneal a.
Anterior tibial a.
SUPERIOR

# Angiosomes




*JVET 2008;15: 580*

# 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

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Departments of [1]Surgery, [2]Diabetology, [3]Emergency Care, [4]Radiology, and [5]Anesthesiology, Princesse Paola Hospital, Marche-en-Famenne, Belgium.
Departments of [1]Surgery, [2]Diabetology, and [3]Emergency Care, Sainte-Thérèse Hospital, Bastogne, Belgium.

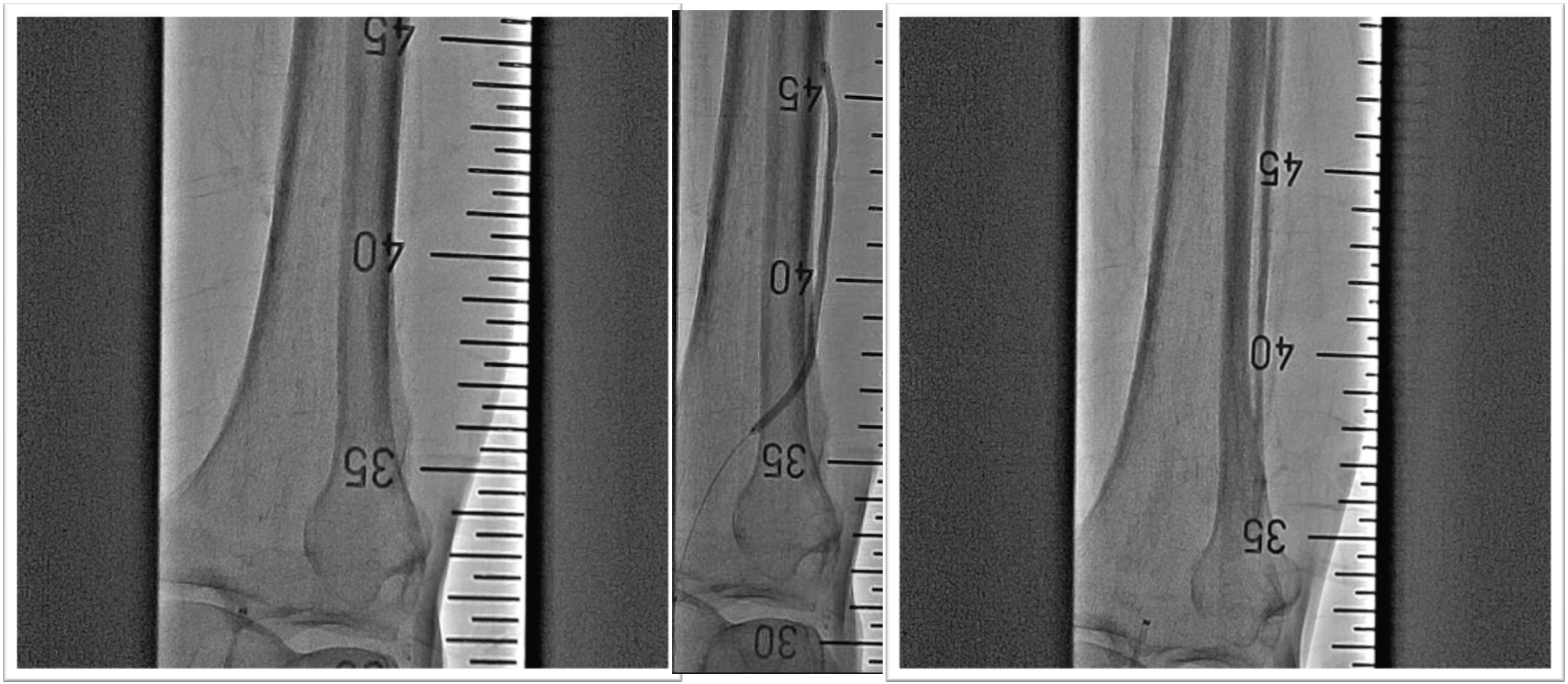
***Purpose:*** To evaluate the technical and clinical outcomes of primary subintimal (SA) and endoluminal angioplasty (EA) guided by an angiosome model of revascularization in diabetic patients with critical limb ischemia (CLI) and Wagner grade 1–4 foot ulcers.
***Methods:*** A retrospective review was undertaken of 98 diabetic CLI patients (68 men; mean age 72.8 years, range 46–94) who presented to our institution from January 2005 to January 2008 for treatment of Wagner grade 1–4 foot ulcers involving 124 limbs. Following the angiosome model of perfusion in the foot and ankle, the target arterial lesions in the 124 limbs were treated with 80 (64%) associated SA and EA procedures, 21 (17%) multilevel EAs, and 23 (18%) single SA techniques.
***Results:*** Initial technical success was achieved in 102 (82%) interventions: 82/103 SAs and 20/21 of the EAs. The 30-day survival rate was 98% (1 fatal myocardial infarction). The cumulative rates of primary and secondary patency, limb salvage, and clinical success were: 57%±4%, 71%±4%, 91%±3%, and 85%±3% at 12 months and 48%±5%, 61%±4%, 84%±6%, and 73%±6% at 32 months, respectively. Limb salvage appeared to be negatively affected at 3 years by the presence of Wagner grade 3–4 lesions ($p<0.0002$), the bedridden condition of patients ($p<0.0001$), end-stage renal disease ($p<0.0001$), left ventricular dysfunction ($p<0.0001$), and peripheral neuropathy ($p=0.023$). Using the angiosome approach, complete healing of ulcers with or without minor amputation was seen in 79% (98/124 limbs), while 62 of 70 Wagner grade 1–2 and 36 of 54 Wagner 3–4 foot lesions healed in the first 1 to 3 months after revascularization.
***Conclusion:*** Targeted primary angioplasty following the angiosome model could be an effective therapeutic method in the ulcer healing process. However, beyond appropriate revascularization, aggressive control of concurrent risk factors in diabetic wound healing probably plays an equally relevant role.

*J Endovasc Ther 2008;15:580–593*

# Intraluminal Angioplasty

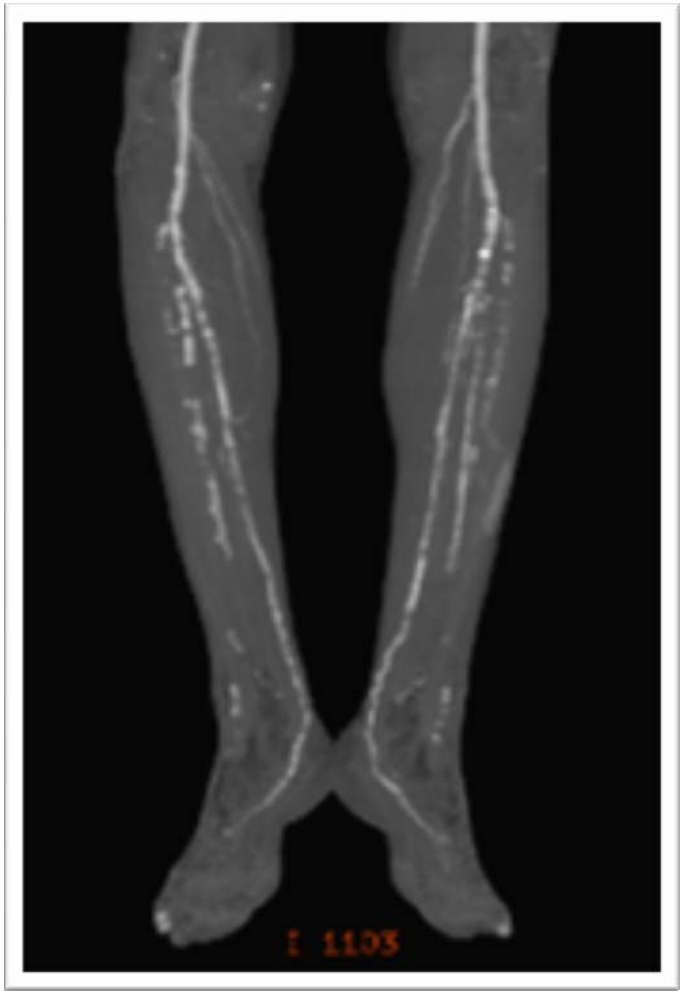
Ansel Sheath 5F, Cook

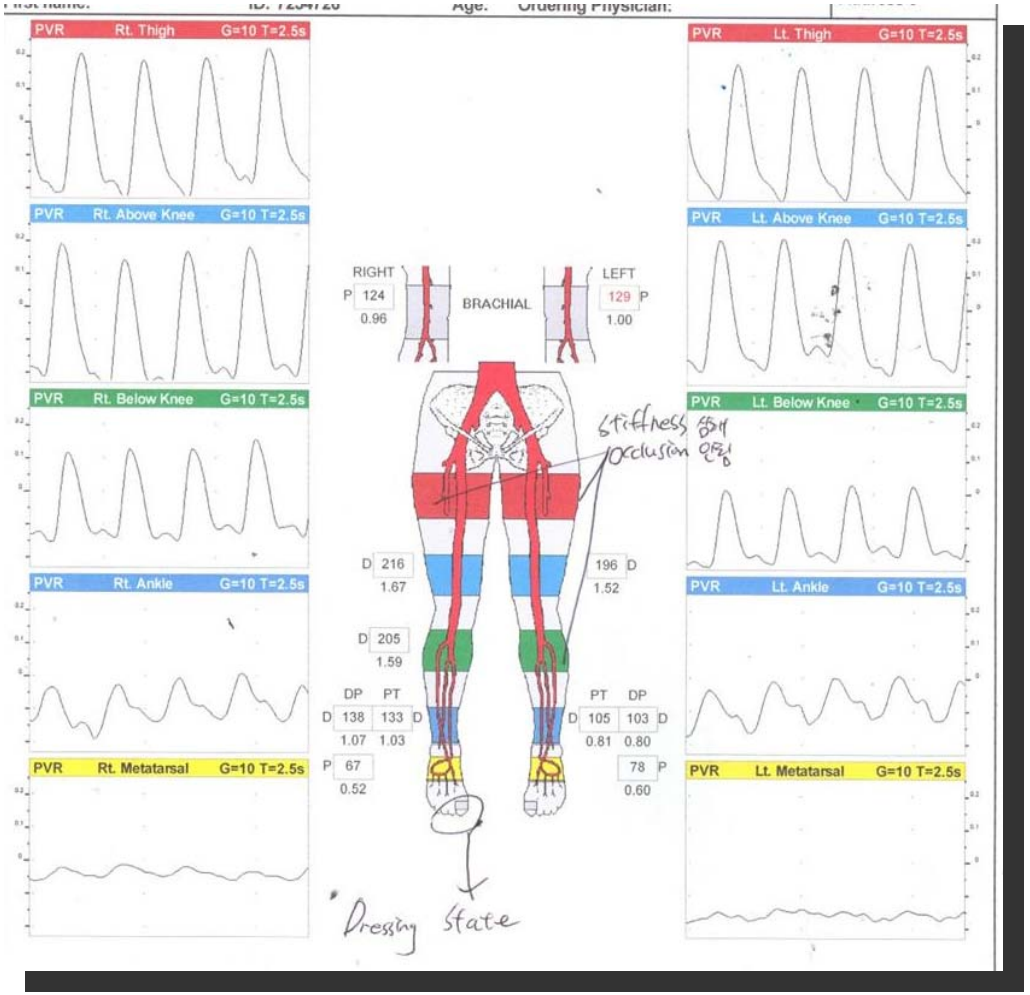
018” Glidewire, Terumo & Savvy 3.0 x 100, Cordis



# M/61

DM+
HTN+
Smoking+



# Subintimal Angioplasty

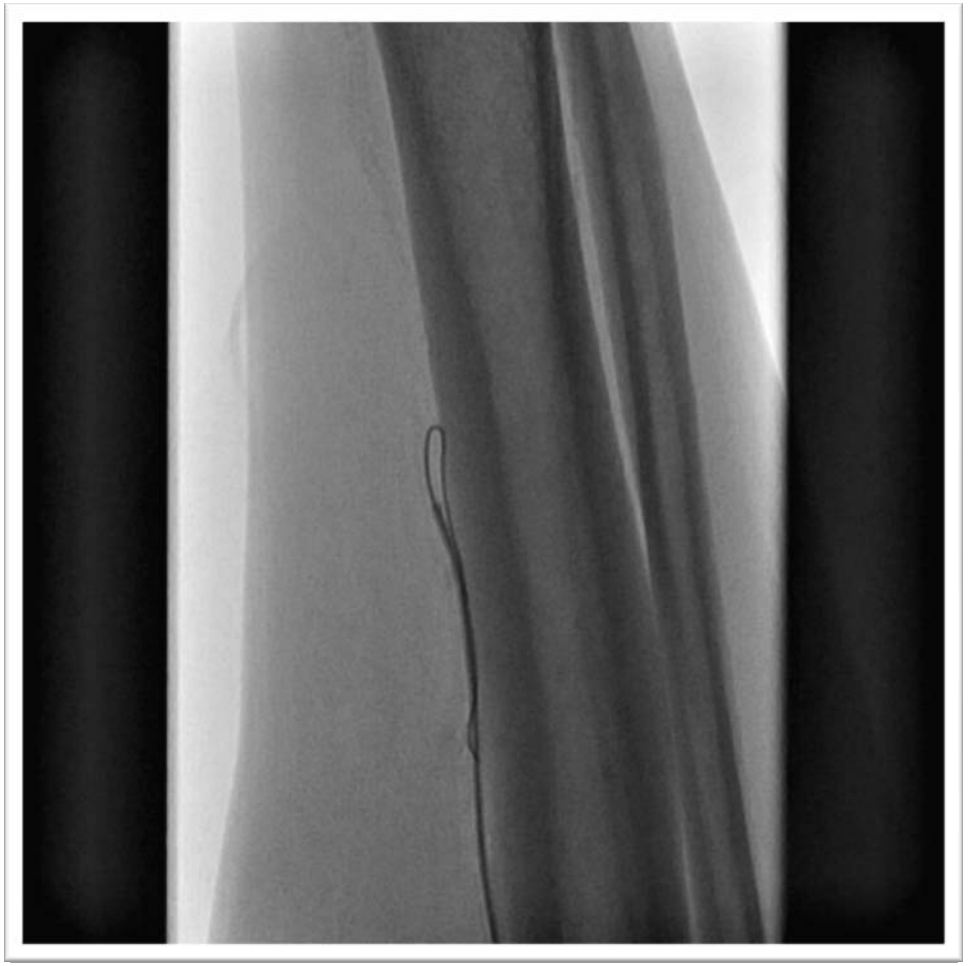
Ansel Sheath 5F

035” J-Tip Glidewire,Terumo

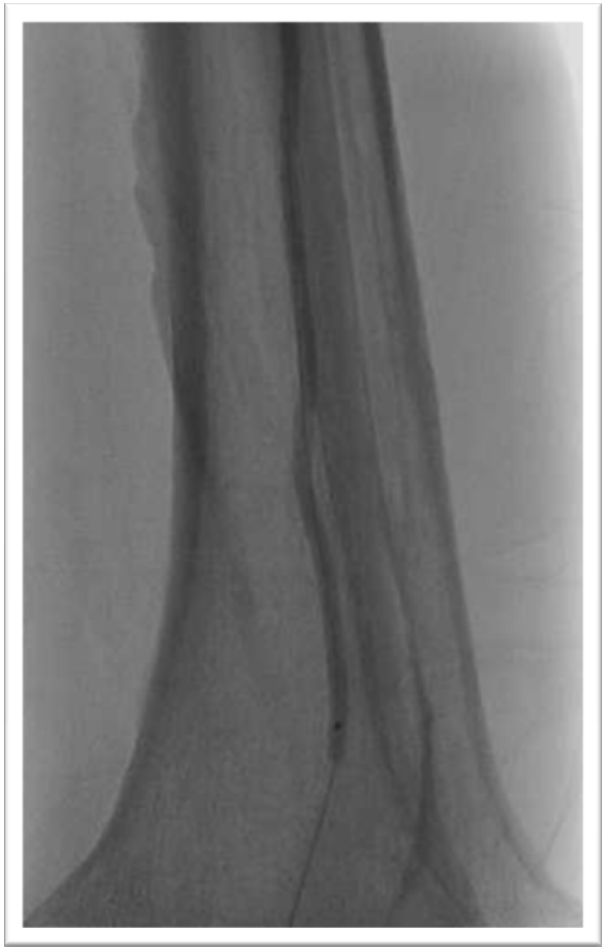
# Subintimal Angioplasty

Savvy 3.0 x 150 mm,
Cordis

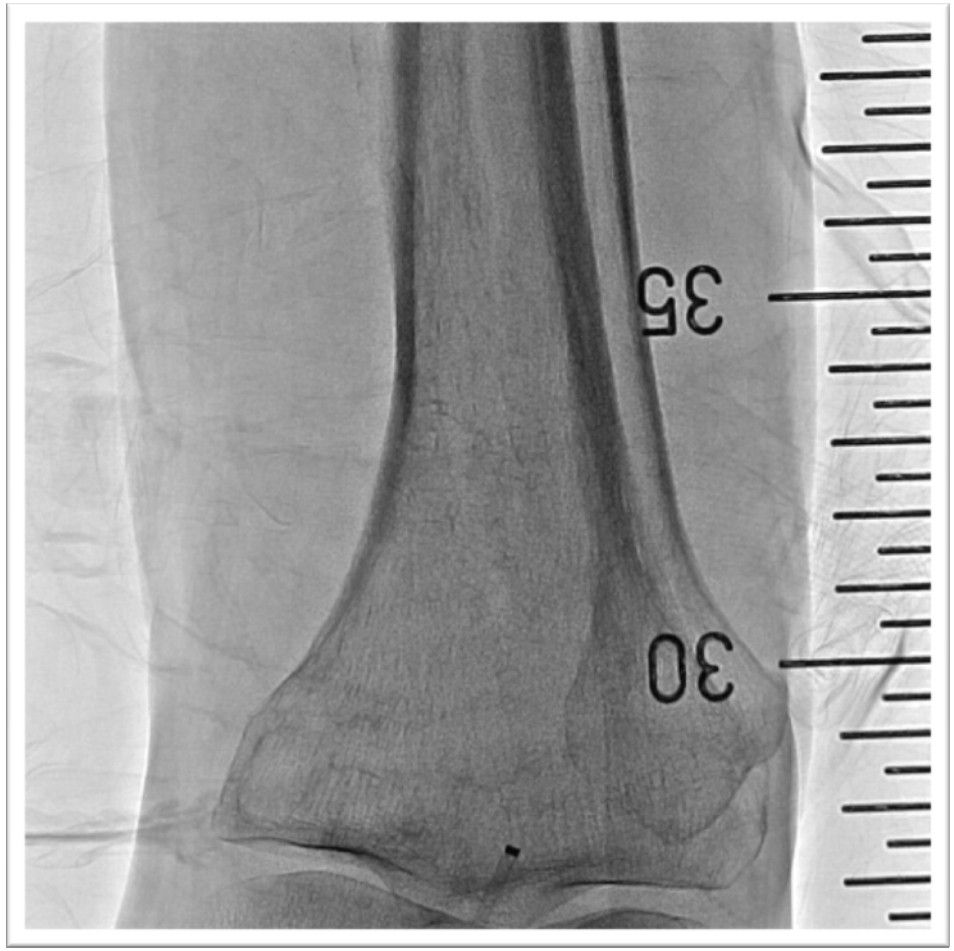
# Subintimal Angioplasty

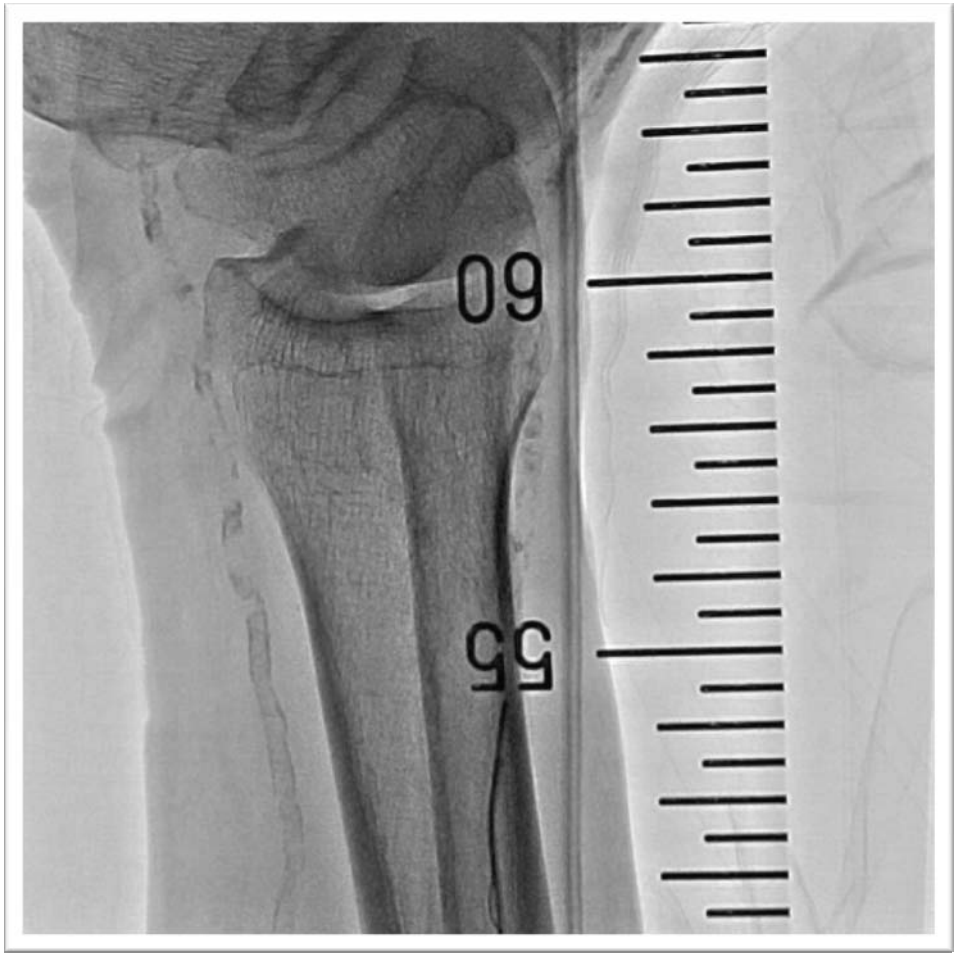


# Complete Revascularization



# Calcified Lesions



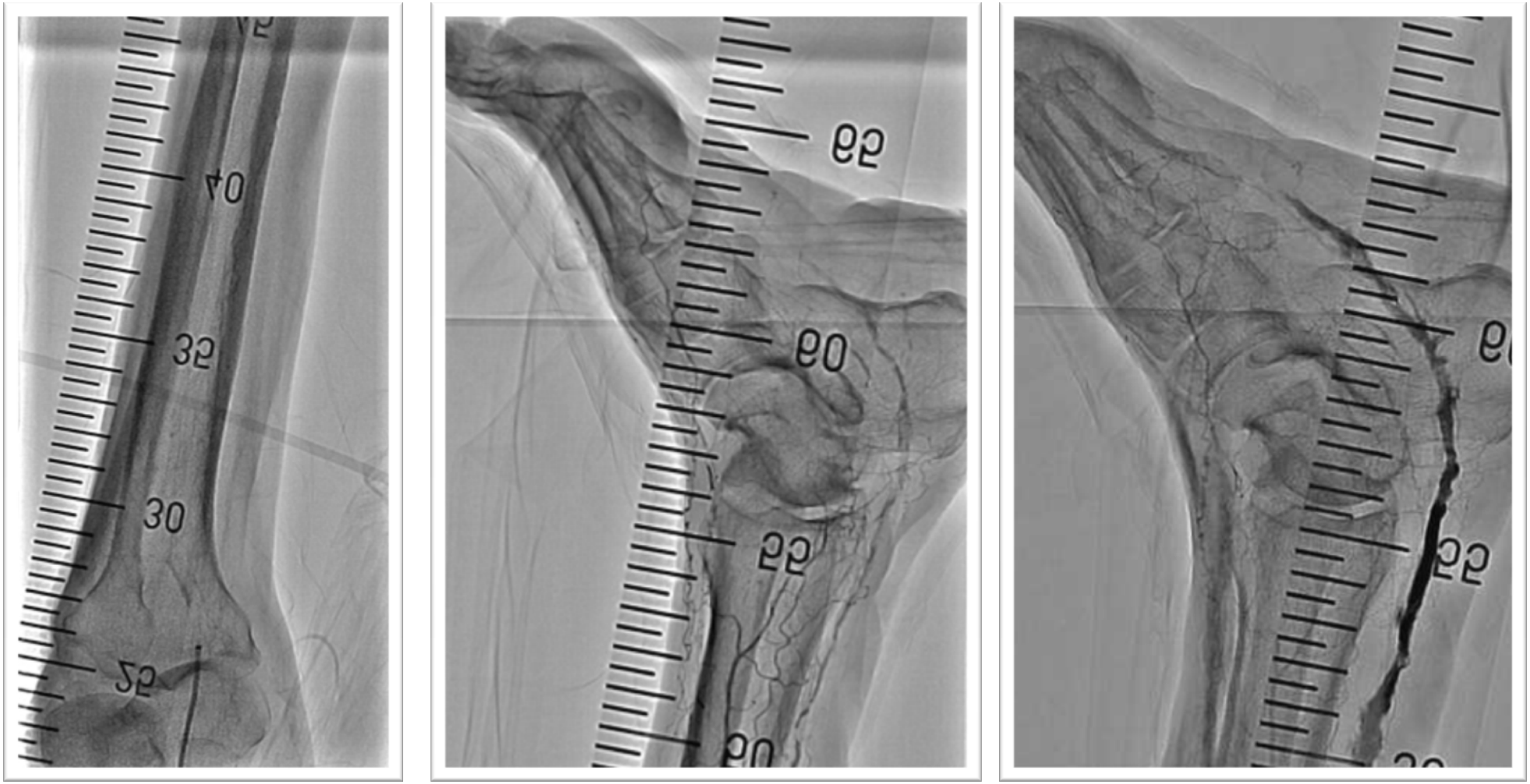
# Calcified Lesions


# Calcified Lesions

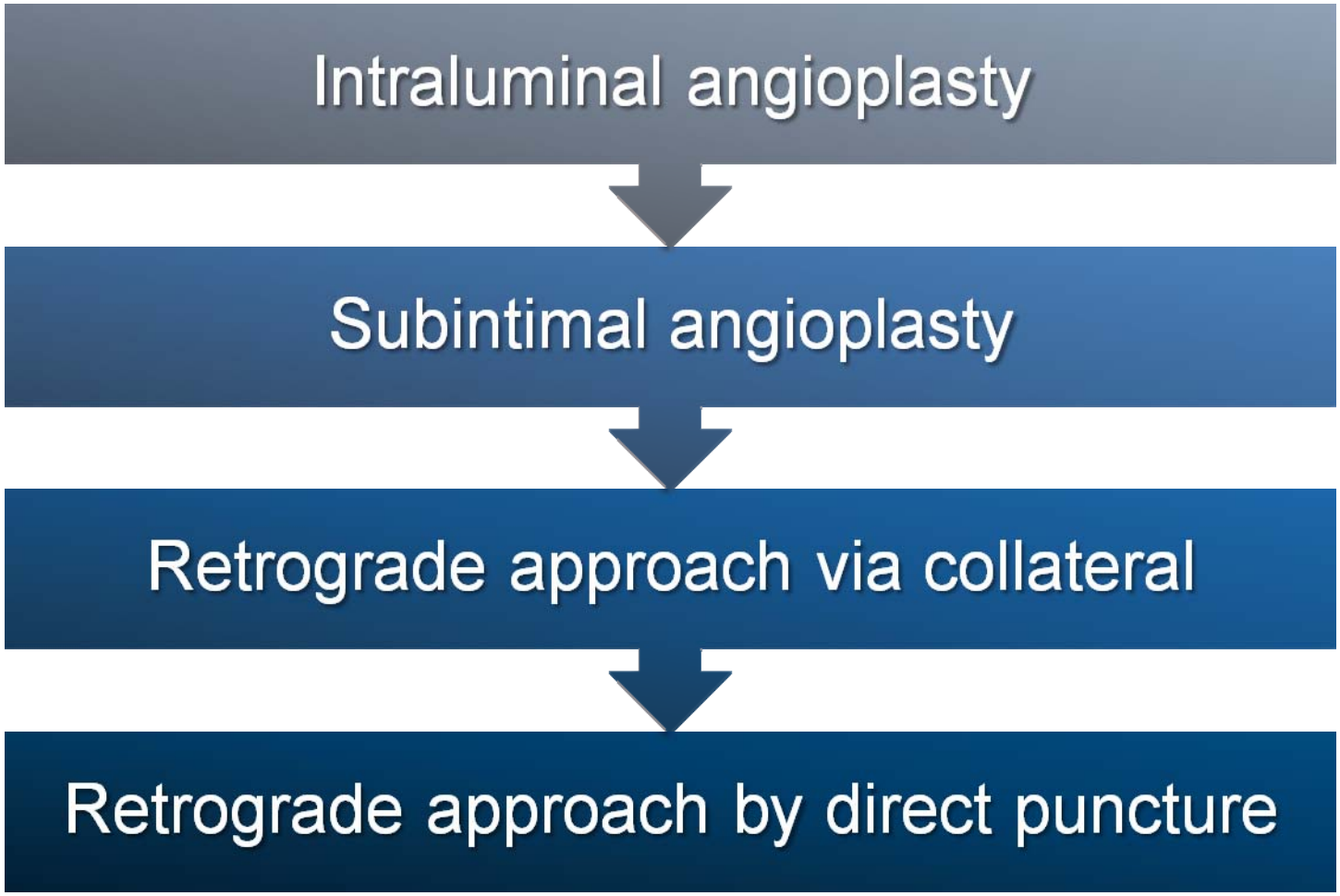
# Retrograde Approach



# Poor Distal Vessels



# Treatment Strategies for BTK-CTO



# Issues of Discussion

1. Intraluminal vs. subintimal angioplasty
2. Stenting vs. balloon angioplasty
3. Efficacy of long balloons
4. Efficacy of DES or DEB
5. Role of atherectomy
6. Other therapies: cryotherapy, laser angioplasty

# Recent Changes in My Intervention Strategy

- Cross-over approach
- Use of 035” or 018” hydrophilic wires
- Use of short balloons
- 1 or 2 target vessels
- Long procedures

- Antegrade approach
- More use of 014” wires
- Use of long balloons
- As many target vessels as possible
- Short procedures