

Endoluminal approach in CTOs

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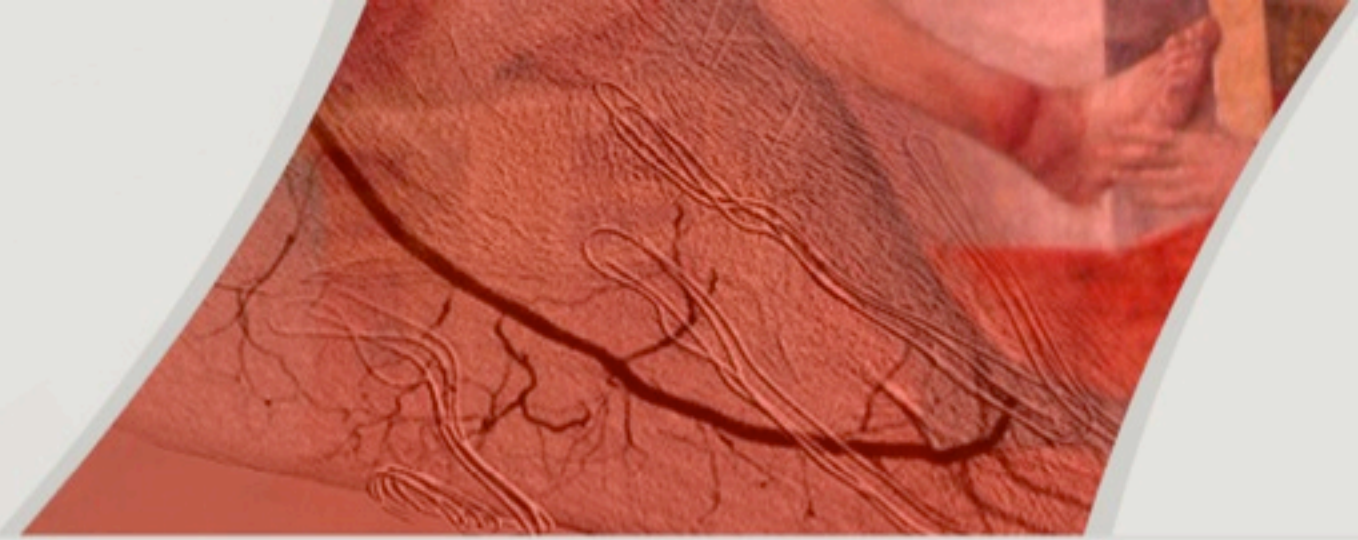
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Endoluminal approach

In CTOs



The Sliding Strategy

- Case 1
- Case 2
- Case 3

The “perforating” strategy

- Case 4

Endoluminal approach in CTOs

Antegrade approach

1. Endoluminal

Endoluminal approach in CTOs

The “sliding” strategy

The endoluminal approach is our first-line approach in every type of lesion, irrespective of the length of the lesion because it is often possible to cross very long BTK CTOs maintaining a likely endoluminal position.

The operator must gently rotate and push the wire in an attempt to cross the lesion. The only explanation of the frequent success of this “sliding strategy” is the presence of a soft inner pathway into the occluded arterial lumen, surrounded by stiffer walls, where a soft tip, lubricious wire is able to cross.

Our first choice wire is a soft tip, 0.014”, hydrophilic wire.

Recently a new family of 0.014” nitinol wires has demonstrated, in our experience, a superior resistance to deformation, reducing the mean number of wires used per procedure.

PATIENT DATA

- 75-year-old female
- Type 2 DM
- HBP
- Creatinine 2.5 mg/dL

Endoluminal approach

ENDO-CASE 1

DIAGNOSIS

- Long ATA and PTA occlusion
- Proximal disease of TPT and PER
- Target: dorsalis pedis

Materials & Technique:

Never give up in BTK long CTOs

Following the step-by-step algorithm we start with an endoluminal approach:

- Berenstein 4 Fr, hydrophilic, diagnostic catheter
- 0.014", soft tip, hydrophilic wire

Rotate & push, rotate & push.....



Endoluminal approach

ENDO-CASE 1



Materials & Technique:

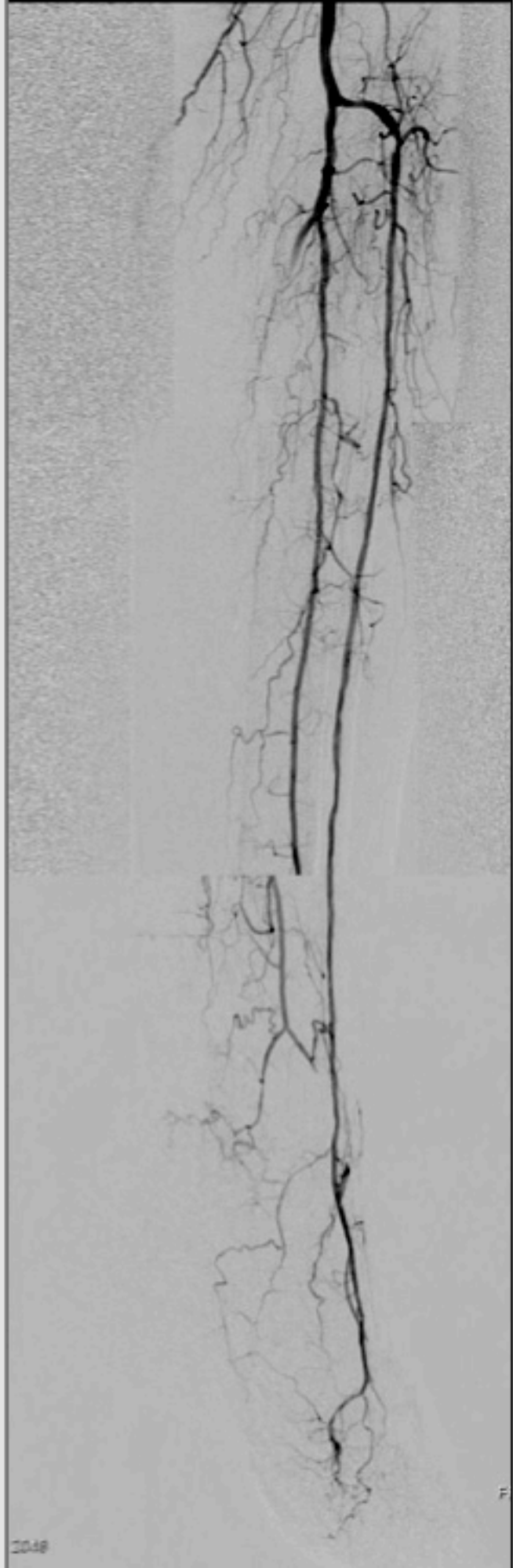
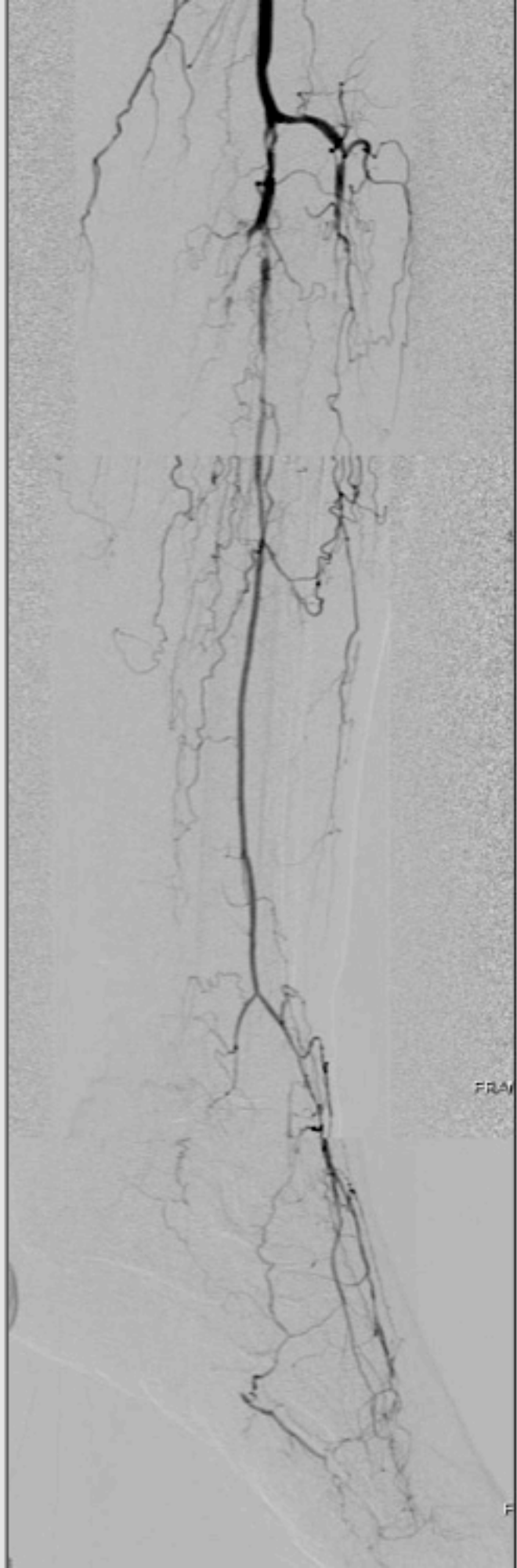
My explanation of this very frequent success in crossing long BTK CTOs is that in many cases there must be a ***soft inner pathway*** into the occluded arterial lumen, surrounded by stiffer walls.

A hydrophilic, soft tip, 0.014" wire is able to cross this pathway maintaining an endoluminal position.

Endoluminal approach - Final result

ENDO-CASE 1

ENDO-CASE 1



PATIENT DATA

- 68-year-old female
- Type 2 DM
- HBP
- Creatinine 1.6 mg/dL
- CLI

Endoluminal approach

ENDO-CASE 2

DIAGNOSIS

- Diffuse disease SFA & POP
- Long ATA, PTA, PER CTOs
- Target: dorsalis pedis

Materials & Technique:

Never give up in BTK long CTOs

Following the step-by-step algorithm we start with an endoluminal approach:

- Berenstein 4 Fr, hydrophilic, diagnostic catheter
- 0.014", soft tip, hydrophilic wire

Rotate & push, rotate & push.....



Endoluminal approach

ENDO-CASE 2

Endoluminal approach - Final result

ENDO-CASE 2

PATIENT DATA

- 74-year-old male
- Type 2 DM
- CLI

Endoluminal approach

ENDO-CASE 3

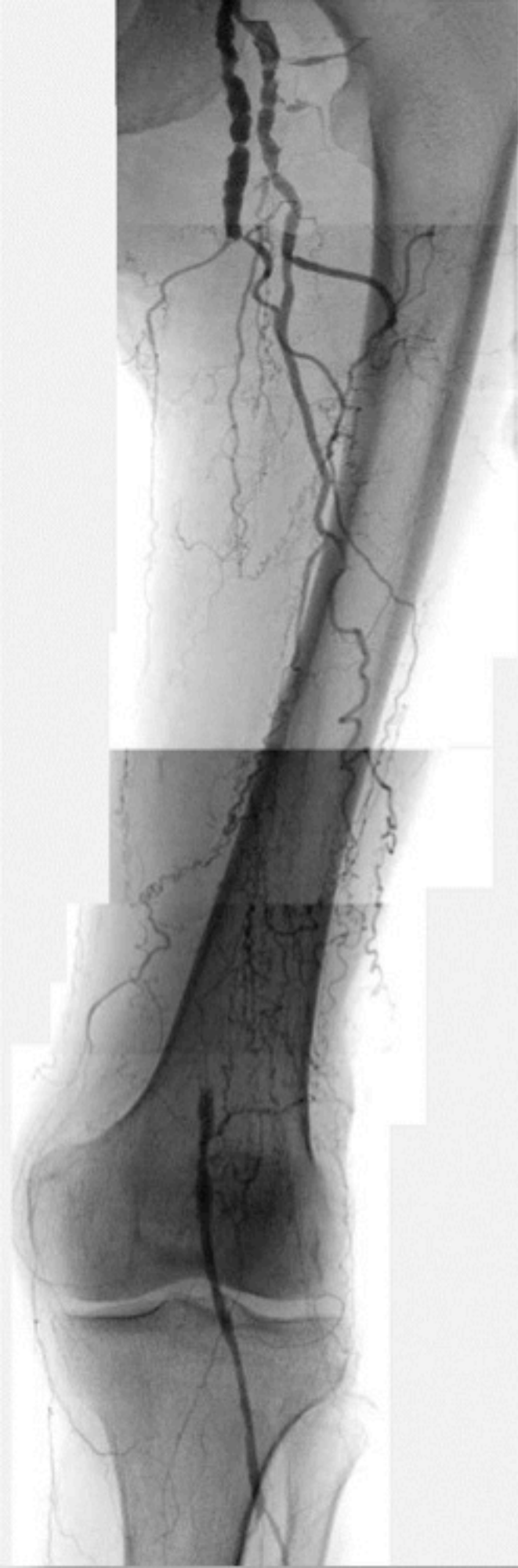
DIAGNOSIS

- Long SFA occlusion

Materials & Technique:

- Berenstein 4 Fr, hydrophilic, diagnostic catheter
- 0.018" wire

Rotate & push, rotate & push.....



Endoluminal approach

ENDO-CASE 3

Endoluminal approach - Final result

ENDO-CASE 3

Endoluminal approach in CTOs

The “perforating” strategy

In case of failure (the wire is unable to advance or clearly goes into the subintimal space, collateral vessels or outside), we decide to change our strategy depending on the type and length of the lesion.

In case of short CTOs, where the distal open lumen is clearly visible a few cm below, we prefer to pursue the endoluminal approach using the coronary parallel-wires technique. We let the soft-tip wire in place, in the wrong direction, and advance a new CTO dedicated, 0.014” wire with a stiff tip.

We change from a “sliding strategy” (the wire tip slides through the inner, tortuous, soft pathway, if present) to a “perforating strategy” (the operator directs the wire tip through the obstructing material towards the distal open lumen). In case of “sliding” the direction is determined by the vessel, in case of “perforating” the direction is given by the operator; using this technique multiple oblique views are necessary, multiple attempts, different wires and a lot of patience....

PATIENT DATA

- 73-year-old-male
- Type 2 DM
- CLI

Endoluminal approach

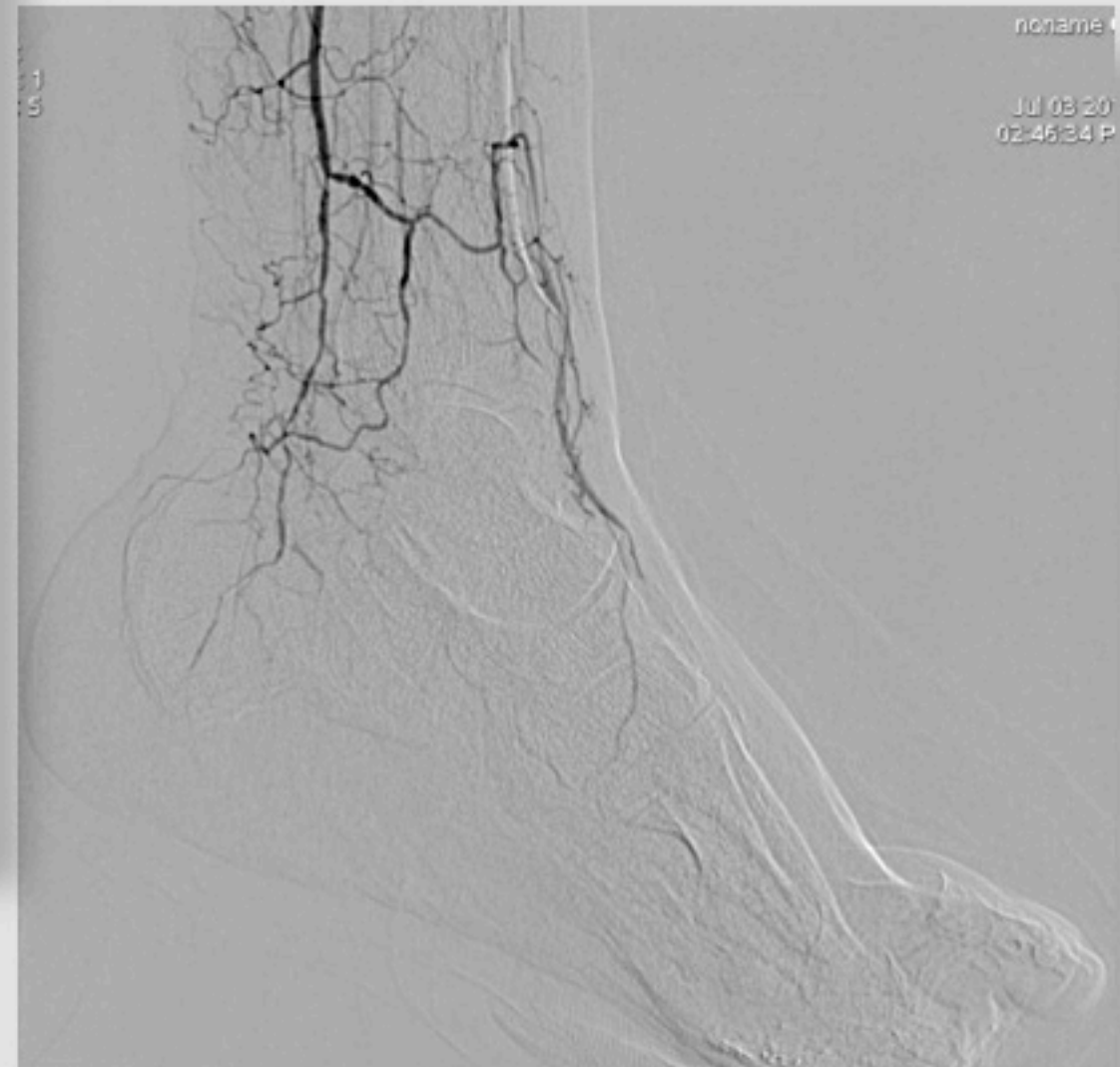
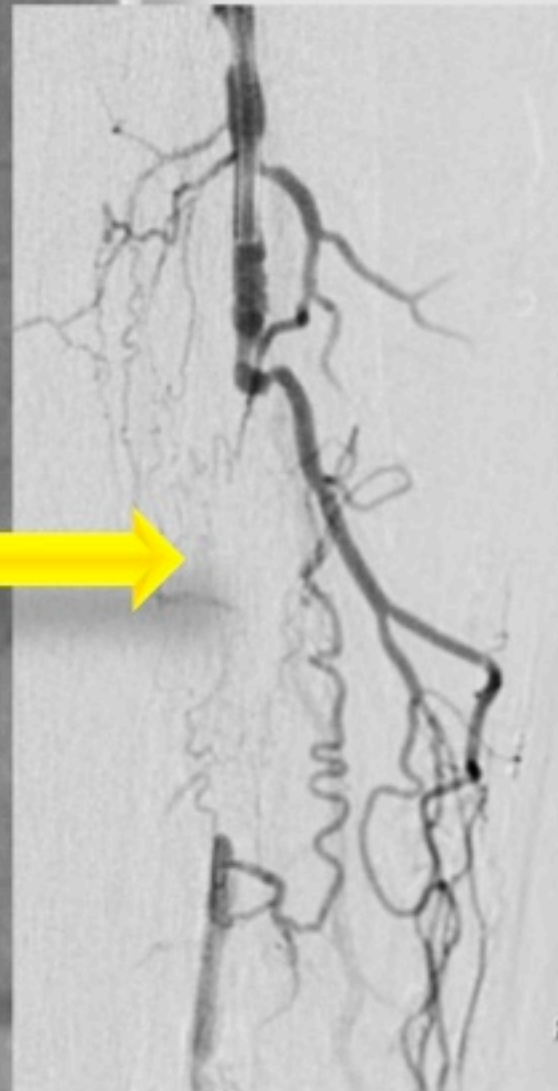
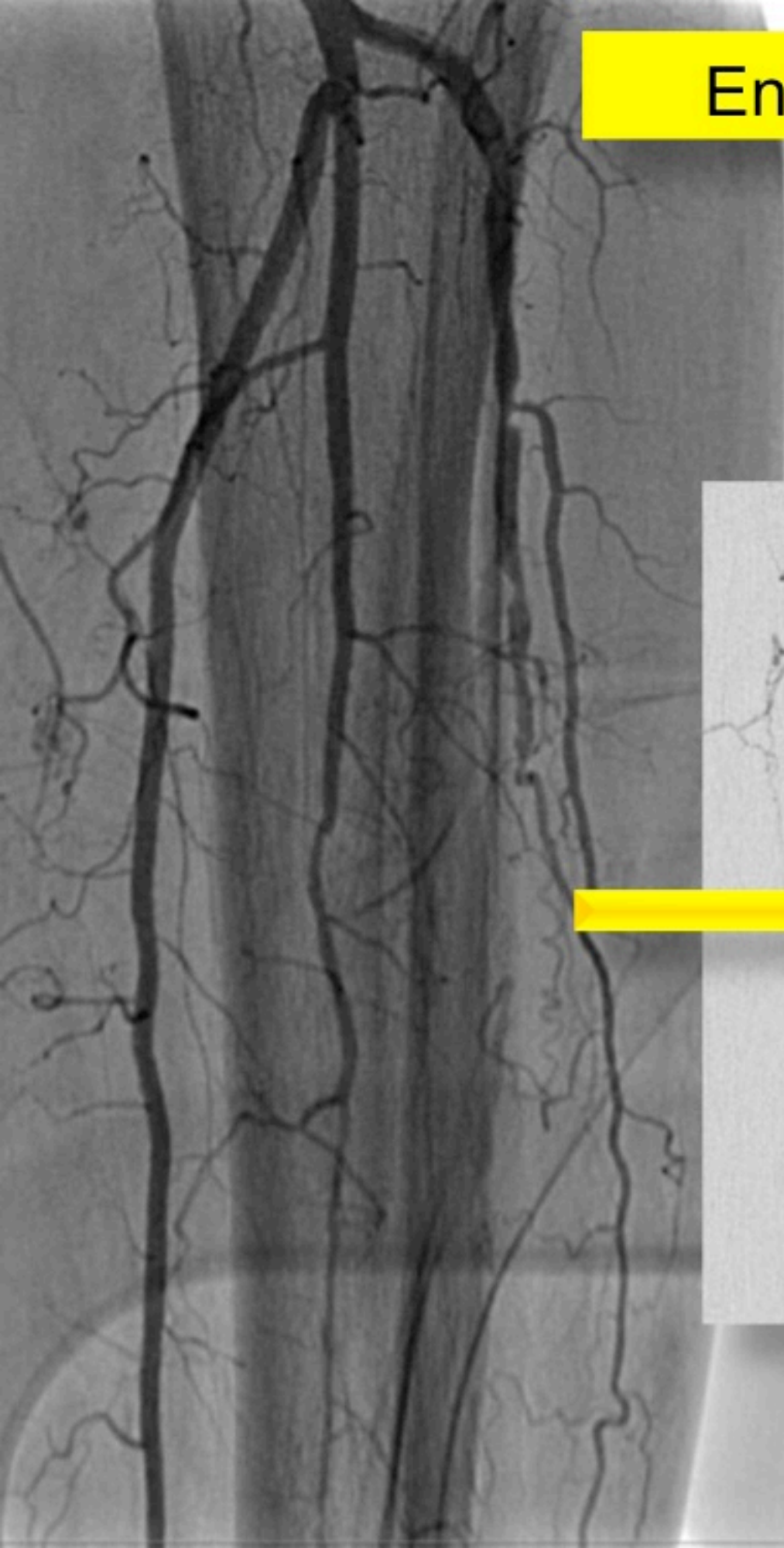
ENDO-CASE 4

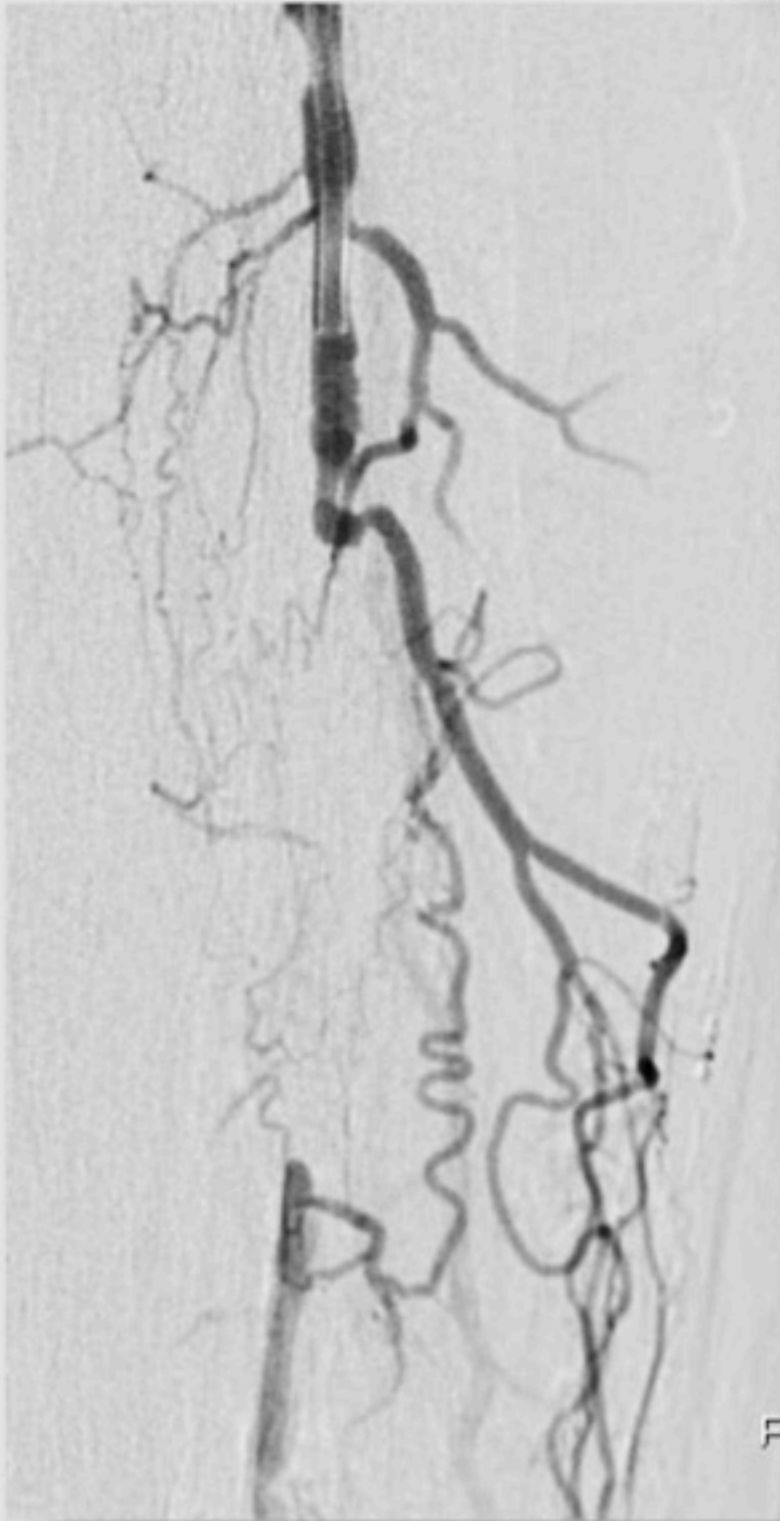
Endoluminal approach

ENDO-CASE 4

DIAGNOSIS

- Short ATA CTO
- Diffuse disease of FOOT vessels





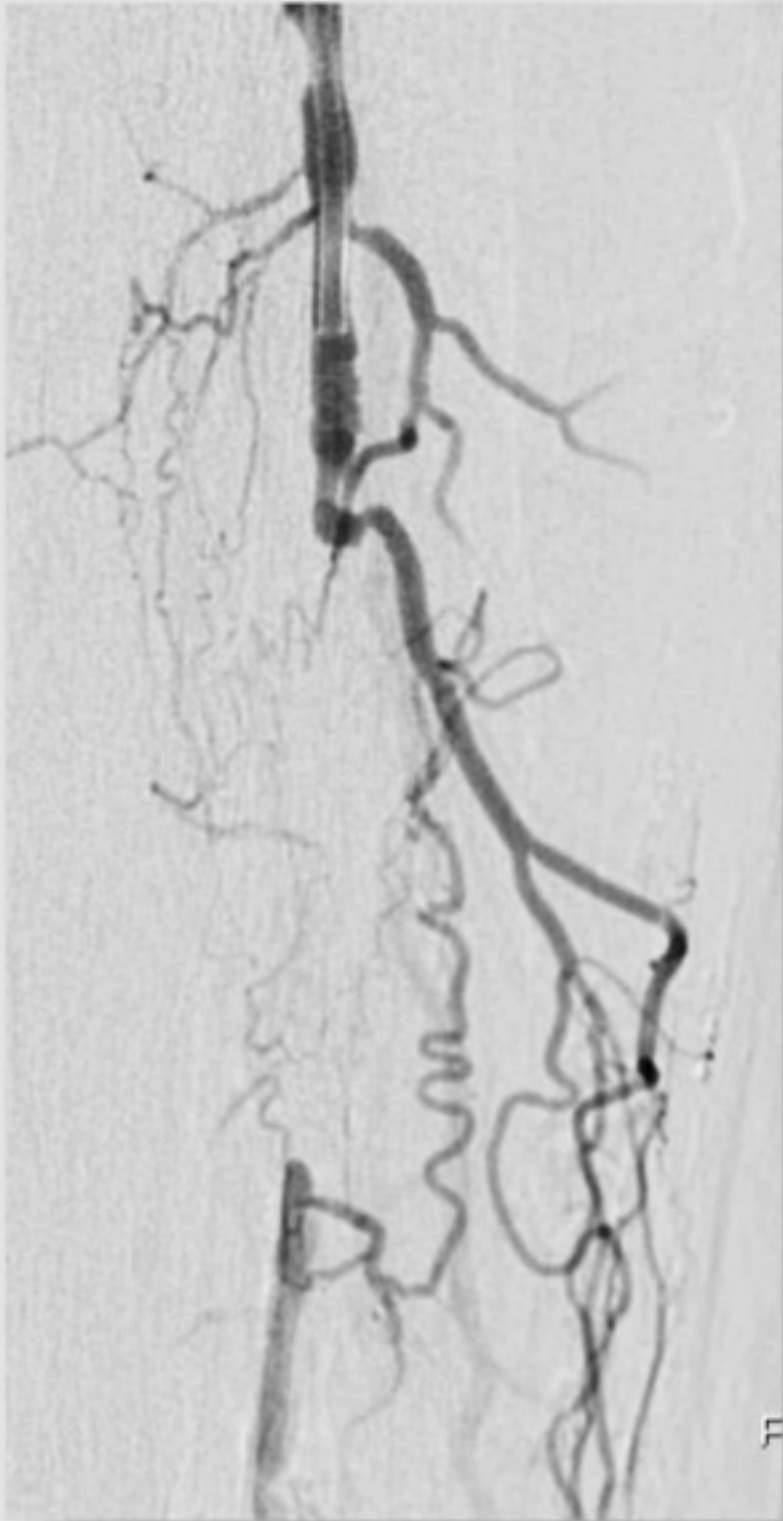
Materials & Technique:

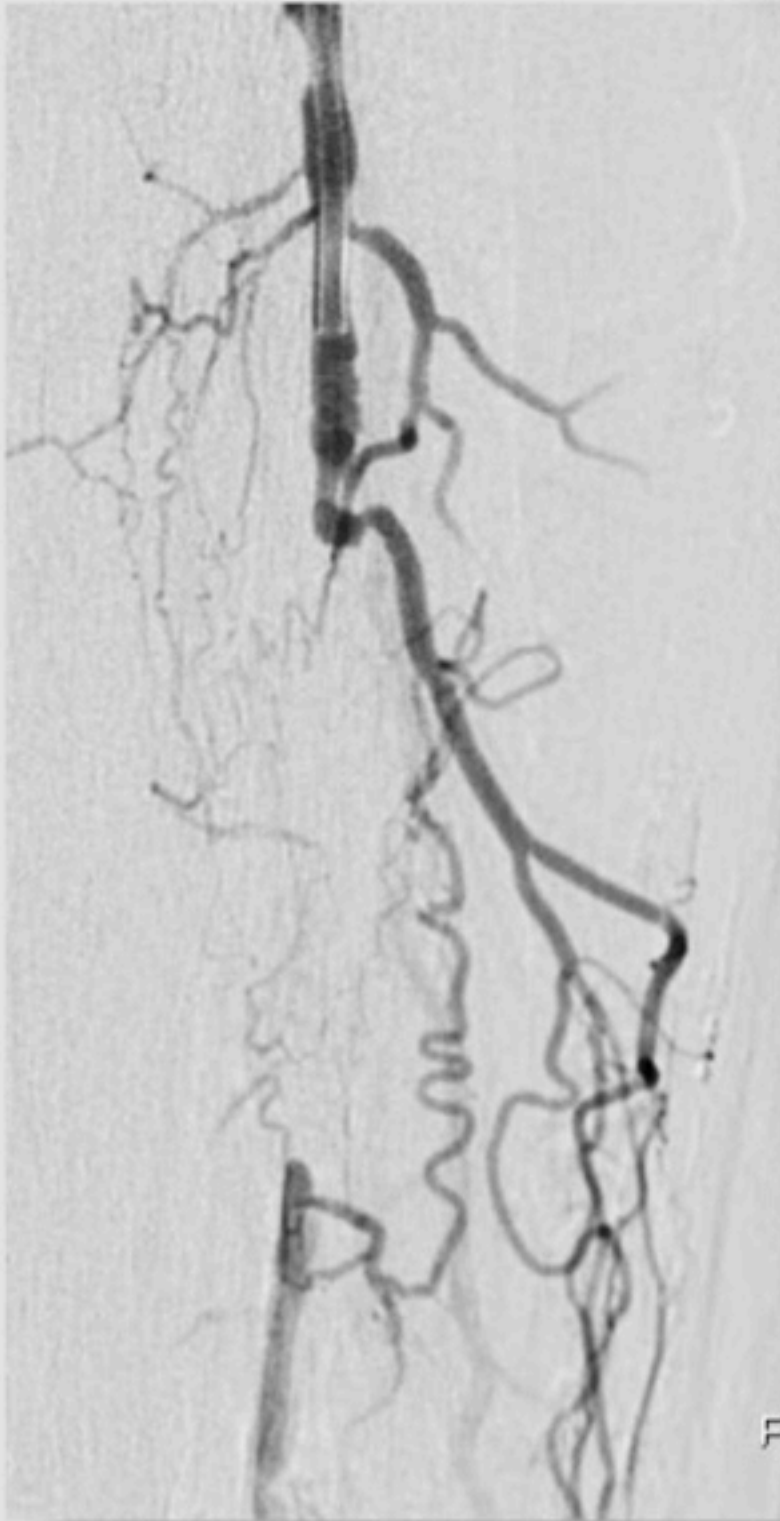
Endoluminal approach to short ATA CTO

- Berenstein 4 Fr, hydrophilic, diagnostic catheter
- 0.014", soft tip, hydrophilic wire

Endoluminal approach

ENDO-CASE 4





Materials & Technique:

Failure of the soft tip 0.014" wire to maintain an endoluminal position.

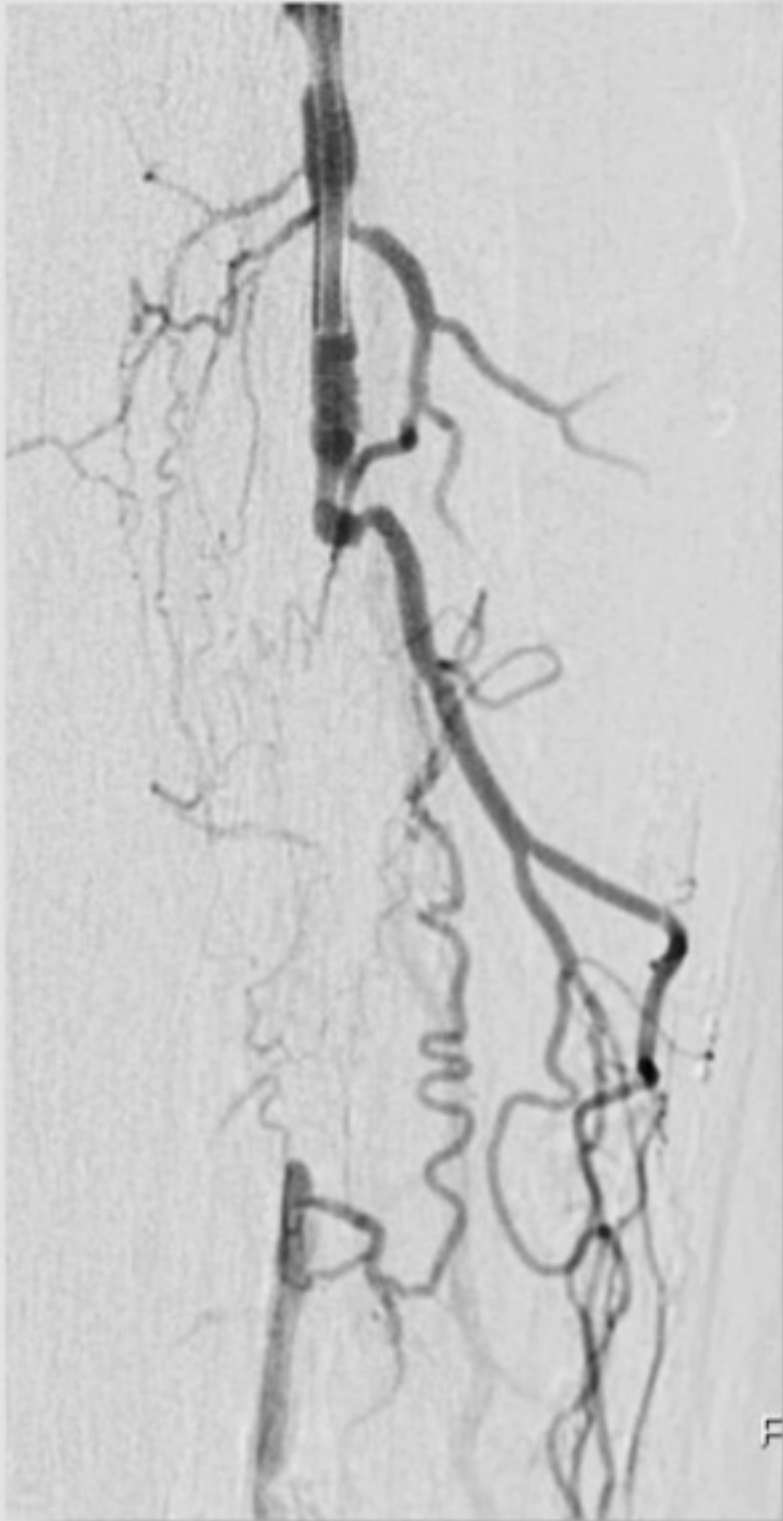
Shift to "coronary parallel-wires technique" using a

- CTO 0.014" dedicated wire
- 12-gauge tip load

This type of wire must be directed in the correct direction: from "sliding" to "perforating"...

Endoluminal approach

ENDO-CASE 4



Materials & Technique:

- Return to a 0.014", soft tip wire
- 0.014", low profile, OTW balloon
- Pedal-plantar loop technique

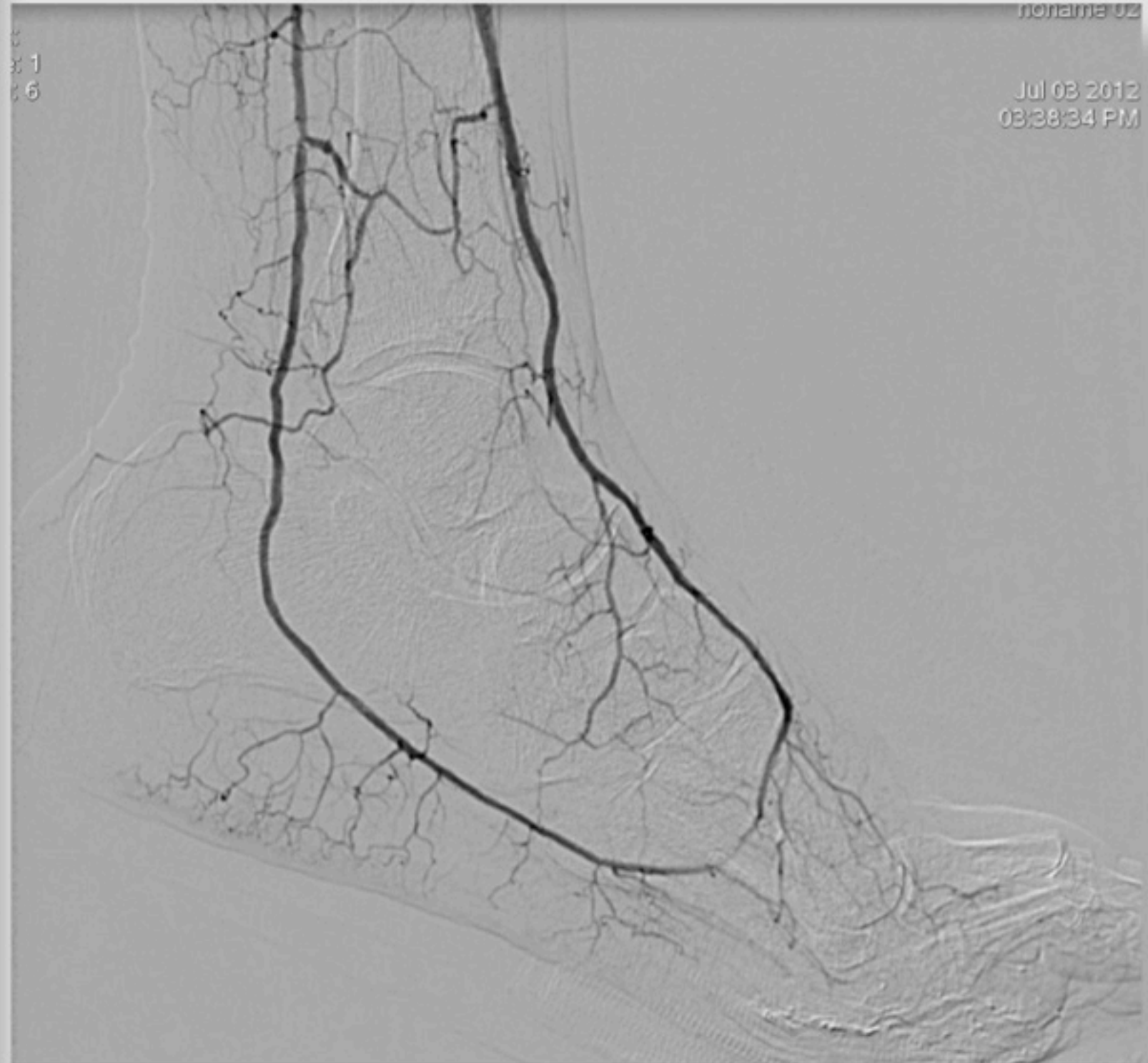
Endoluminal approach

ENDO-CASE 4

Endoluminal approach - Final result

ENDO-CASE 4

ENDO-CASE 4



Endoluminal approach in CTOs

Failure of endoluminal approach

In case of long CTOs, where the endoluminal attempt has clearly failed, we shift to the subintimal approach because it is quite impossible to cross long segments of vessel using a “perforating strategy”