

# Step-by-step approach in CTOs crossing strategy

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# Step-by-step approach

in CTOs crossing strategy

Overview

Position of the operator

The exploring system

Techniques

## Step-by-step approach in CTOs crossing strategy

It is incorrect to indicate a single type of catheter or wire as a systematic approach, because every operator can be familiar with different diagnostic and support catheters and wires and the same task can be done using different devices, depending on the operator's experience.

*Therefore, the following description merely reflects our personal experience.*



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## Position of the operator



In antegrade femoral approach we prefer to work in this way:

- the patient has the head on the right side of the operator
- The screen are on the right side of the patient, in front of the operator
- The table is on the right side of the operator and the devices (balloons etc.) can be put directly on the table



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## The exploring system

Our standard approach resembles the traditional coronary angioplasty method: the guiding catheter is substituted by a hydrophilic, 4 French, 100 cm long, diagnostic, Berenstein catheter. The proximal luer lock of the Berenstein catheter is connected to a standard Y-shaped connector, the other luer lock of the Y-shaped connector is connected to a stopcock and a syringe for contrast injection. Using an inserter, several types of 0.014" and 0.018" wires can be inserted into the catheter and advanced into the vessel tree. Sliding on the wire the Berenstein catheter is advanced to the proximal edge of the stenosis or the CTO.

In the proximal arched segment of ATA or the retromalleolar segment of PTA a gentle rotation and push of the Berenstein catheter generally permits the crossing of the bends and the distal advancement of the catheter.

Small injections of diluted contrast dye (1-2 mL) through the lateral side of the Y-shaped connector obtain highly selective angiographic images of the vessel around the distal catheter tip, orientating our crossing strategy. In case of failure of the Berenstein catheter in advancing into a diseased vessel or into a subintimal space the diagnostic catheter is replaced by a support catheter or by an over-the-wire, low-profile, 0.014" balloon.







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The first step in percutaneous recanalization is to cross the long CTOs typical of diabetic CLI. Different techniques are now available: endoluminal approach, subintimal, trans-collateral, pedal-plantar loop technique and retrograde puncture of the vessel beyond the CTO. The next slide summarizes the role of these different techniques in a step-by-step approach.

*Current Diabetes Reviews, 2012, 9, 000-000*

## **The Management of Diabetic Foot**

Carlo Caravaggi<sup>1\*</sup>, Adriana Sganzaroli<sup>1</sup>, Paolo Galenda<sup>1</sup>, Matteo Bassetti<sup>2</sup>, Roberto Ferraresi<sup>3</sup> and Livio Gabrielli<sup>4</sup>

Tips and tricks for a correct “endo approach”.  
Ferraresi R, Palena LM, Mauri G, Manzi M  
J Cardiovasc Surg, submitted for publication

# Step-by-step approach in CTOs crossing strategy

## ❑ Antegrade approach

1. Endoluminal
2. Subintimal



*Failure*



## ❑ Retrograde puncture

## ❑ Transcollateral

1. Pedal-plantar loop technique
2. Peroneal artery branches PTA