Crossing the Long SFA CTO
Techniques and Variables You need to Know

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Background

Superficial femoral artery (SFA) CTO intervention has high success rate and widely developed. SFA is relatively straight vessel, and possible to do bidirectional approach. Only difficult case is severe calcification which could not be crossed by the wire. The other one is post bypass occlusion because serious fibrosis occurred at anastomosis site.
Peripheral CTO strategy

There is no standard method for CTO intervention, especially for wire selection. Interventional cardiologist prefer slender wires. To aim 100% success, you need to do bidirectional approach. Usually, retrograde approach is from popliteal artery.
Kyoto Katsura Cardiovascular Center
1998 to 2011.4.7
2024 case with 2743 lesions
shant 13.3%
otheres 0.4%
Carotid 2.4%
Subcravian 2.7%
Abdominal 1.0%
Aorta 0.4%
Renal 2.8%
Iliac 24.0%
Femoral 40.7%
BK 12.3%
Key of the CTO treatment

Don’t perforate:
- Ballooning and compression

Don’t emblize:
- Distal protection in high risk lesion.
  - Suction
## Superficial Femoral artery

<table>
<thead>
<tr>
<th></th>
<th>SFA</th>
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<tbody>
<tr>
<td>Lesion</td>
<td>1061</td>
</tr>
<tr>
<td>CTO</td>
<td>227 (21%)</td>
</tr>
<tr>
<td>CTO Success (recent 3Y)</td>
<td>95% (97% 87/90)</td>
</tr>
<tr>
<td>Stent used (recent 3Y)</td>
<td>(44%)</td>
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</tbody>
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1998 to 2011.4.7
## Wire characteristics for CTO

<table>
<thead>
<tr>
<th>Size</th>
<th>0.014</th>
<th>0.018</th>
<th>0.035</th>
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<tbody>
<tr>
<td></td>
<td>Manipulation</td>
<td>Similar to coronary</td>
<td>Knuckle</td>
</tr>
<tr>
<td></td>
<td>advantage</td>
<td>Less perforation</td>
<td>Controllable</td>
</tr>
<tr>
<td></td>
<td>Disadvantage</td>
<td>Chance of perforation</td>
<td>Difficult re-enter from false to true lumen</td>
</tr>
<tr>
<td></td>
<td>Stent need</td>
<td>Not always</td>
<td>Mandatory to entire lesion</td>
</tr>
<tr>
<td></td>
<td>Where</td>
<td>BK lesions Unexpected curve</td>
<td>Perforation by 0.018 inch wire</td>
</tr>
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Approach to SFA CTO

Long SFA CTO

6F Guide sheath

4-6F long sheath

Distal SFA CTO

Complex Iliac Anatomy
How to puncture the popliteal artery

Needle guide bracket on Echo probe (18G needle)
White dots indicate needle route
If popliteal vein is running over the artery, aim to the angulated side.
Left leg

Arterial back flow

Advance a 0.035 wire
Insert the 6F long sheath

Cover the sheath inserted foot

Cover with sterilized sheet

Turn the patient to supine position
Antegrade femoral puncture

Take out popliteal long sheath

Toe
Retrograde wiring from popliteal artery

Antegrade puncture

Asahi 0.018 :12g and Transit
Successful reentry to the proximal artery and IVUS

Reentry

IVUS after wire crossing
Mobile plaque was seen in the CTO section by IVUS
When you need distal protection (IVUS findings)

① poorly-echogenic plaque
② mobile plaque
③ homogeneous plaque of mildly raised echogenicity
④ plaque with small blood flow channels

Easy to cross by the wire
How to do distal protection

A protection balloon from popliteal sheath
Distal 6.0x40mm 3 atm

Lesion dilatation antegrade
Proximal 6.0x80mm 4 atm
Debris removal by 6F straight guiding catheter

Removed thrombus

Contrast injected via retrograde balloon wire lumen to check the residual plaque.
Wall stent deployment

Stent distal position was checked by contrast through the retrograde balloon

No distal embolization
Distal protection in SFA CTO

In series of 126 consecutive SFA CTO lesions, bi-directional approach was performed in 92 lesions (73%).

In 9 of 92 (9.8%) cases, distal protection was applied based on IVUS findings and successfully removed some thrombus.
Echo guide antegrade wiring (New approach for SFA CTO)

To set up bidirectional approach takes time about 40 minutes. We have started echo guide antegrade wiring April 2009.

Total SFA CTO  32 lesions
   Echo guide    22 ( 68% )
   Angio guide   10(32%)
Bidirectional  3/32 ( 9% )
   severe calcification  1
   Stent occlusion  2
Echo guide antegrade wiring

Toshiba Xario 7.5Mhz
Case Example

6F Guidesheath

4F 80cm catheter
Echo Guide CTO  SFA PTA

0.018 inch 12g (Asahi)
Directory push by the 0.018inch wire
PTA

5.0 x 80mm 4 atmospheres
Final and angiogram
Advantage of ECHO guide SFA-CTO

- Reduce fluoro time
- Can start with stiff wire, because we can see the CTO vessel.
- Contrast is not necessary
Trend in SFA CTO

• Bi- Directional approach is key to success.
• Interventional cardiologist prefer 0.018 inch wire try to go center of the CTO plaque.
• IVUS is useful to get feed back from the invisible situation in the vessel.
Thank you