Retrograde CTO Puncture Technique

Hiroshi Ando, MD

Heart Center, Limb Salvage Center
Kasukabe Chuo General Hospital
Saitama, Japan
Disclosure

Speaker name: Hiroshi Ando

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

✔️ I do not have any potential conflict of interest
Puncture Needle

SFA distal
Pop.(P1-2)
Pop.(P3)

High anterior tibial a.
Peroneal a.

22G, 42mm Supercath ® (Medikit)

21G, 70mm Micropuncture® (Cook)
20G, 105mm Medikit introducer needle

Posterior tibial a.
Anterior tibial /
Dorsalis pedis a.

Plantar a.
Metatarsal a.
Distal Puncture

Fluoroscopic guidance

Calcification of the high ATA

DPA

22G Intravenous catheter

Calcification guidance

Guidewire guidance

The wire comes through pedal arch
Distal Puncture

- Sheathless approach
- Microcatheter or low profile OTW balloon backup

Regalia XS 1.0

Prominent (Tokai Medical Products)

Coyote ES (Boston Scientific)
# C-Arm Position

<table>
<thead>
<tr>
<th>Target Vessel</th>
<th>Appropriate View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distal SFA</td>
<td>Contra-lateral ob.</td>
</tr>
<tr>
<td>P3 (Anterolateral puncture)</td>
<td>Ipsi-lateral ob.</td>
</tr>
<tr>
<td>Dorsalis pedis A.</td>
<td>Frontal *</td>
</tr>
<tr>
<td>Distal anterior tibial A.</td>
<td>Frontal or ipsi-lateral ob.</td>
</tr>
<tr>
<td>Distal posterior tibial A.</td>
<td>Contra-lateral ob.</td>
</tr>
<tr>
<td>High anterior tibial A.</td>
<td>Ipsi-lateral ob.</td>
</tr>
<tr>
<td>Distal peroneal A.</td>
<td>Ipsi-lateral ob.</td>
</tr>
<tr>
<td>Plantar A.</td>
<td>Contra-lateral ob.</td>
</tr>
<tr>
<td>Digital A.</td>
<td>Frontal *</td>
</tr>
</tbody>
</table>

* : Frontal means the front with respect to the direction of the foot. Not always A-P view.
Needle should be in one line with the vessel!
Anterolateral Popliteal Puncture

Anterolateral Popliteal Puncture

To avoid backwall injury...

Change the arm’s position frequently

Distal Puncture
(High Tibial Puncture)

Ipsi-lateral ob.
Distal Puncture
(Peroneal Puncture)

Ipsilateral View

Contralateral View

Ipsi-lateral ob.

Contra-lateral ob.

Ipsilateral View

Contralateral View
Distal Puncture (Plantar Puncture)

Contra-lateral ob.

*Needle:* 22G, 42mm IV catheter
*Guidewire:* 0.014inch Regalia

*Microcatheter:* Prominent NEO
Distal Puncture
(Digital Puncture)
Distal Puncture
(Digital Puncture)

22G, 42mm IV catheter

Frontal view
Distal Puncture (Wound Puncture)

Frontal view
Distal Puncture (Wound Puncture)
Occluded Vessel Puncture
Occluded Vessel Puncture

Contra-lateral ob.

Ipsi-lateral ob.
Conclusions

• The distal puncture gives us an another chance to reopen the clogged vessels in which surgical revascularization is infeasible or contraindicated.

• The keys to successful distal puncture are the choice of devices, C-arm position and the direction of puncture.

• It’s relatively safe and has a profound effect on recanalization after failed antegrade approach, however, carrying it out thoughtlessly would be refrained.