Successful retrieval of the detached tip of crosser catheter using a two-wire technique with a gooseneck snare

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Disclosure

Speaker name:

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I do not have any potential conflict of interest.
The crosser catheter is a device that facilitates intraluminal recanalization by high-frequency vibration energy and cavitation.

Detachment or complete separation of the tip of a crosser catheter is a serious complication; however, there is limited information on bail-out methods.
76 y.o. woman  CLI (Rutherford 5)

CC : an ulcer on the right 5th toe
PMH : hemodialysis, diabetes, CABG, AVR, MVR
HPI :
X-10 mo  an ulcer on the right 5th toe → ASO (CLI)
X-6 mo  EVT for the right ATA
→ The ulcer did not resolved. And she was referred to our hospital for re-EVT.

Med :

Aspirin 100mg  Cilostazol 200mg  Warfarin 0.75mg
Insulin lispro 26U  Carvedilol 2.5mg  Rosuvastatin 2.5mg  Vildaglaptin 50mg
Esomeprazole 20mg  Fosrenol 2250mg  Ursodeoxycholic acid 300mg
1st EVT for the right BTK (Jan. 2016)

2mm POBA

Pre

Post
ABI
R) 0.59  L) 0.65

SPP
Unmeasurable

Blood flow

an ulcer
Initial Angiography

〈Rt. SFA〜Pop〉

〈Rt. BTK〉
Initial Angiography

(proximal)  (distal)  (Below the ankle)

PA  PTA  ATA  ATA

Long CTO  Short CTO  Dorsalis pedis artery
Target vessel: **ATA (± PA, PTA)**

Ipsilateral antegrade approach

Use of **crosser catheter** as a **flossing device**
Crosser flossing in ATA

〈proximal〉

〈distal〉
Complete separation of the metal tip
The retrieved shaft of a crosser catheter

The tip was completely separated and left in the ATA.
Cruise wire
Tip 1.1mm
ATA
Stenosis with severe calc
Core wire
ATA
Attempt 1
Direct catch by using gooseneck snare

Cruise wire
Tip

snare
Attempt 2
Crossing an 014” tapered wire through the irrigation outlets

Guidewire lumen
Cruise
014” Tapered wire
Tip
Irrigation outlets

Crusade PAD
Jupiter MAX
Attempt 3
We crossed a new wire, and advanced the snare to the distal side of the tip.

Cruise wire
Tip
A 014” Halberd wire was crossed into the small space beside the tip.
The snare was re-inserted along the new wire and successfully advanced to the distal side of the tip.

The Cruise wire once pulled back, and inserted into the loop of the snare.
The two wires were entrapped by the snare.

The detached tip was retrieved with the entire system as a unit.
Final Angiography

ATA-POBA
Jade 2.0×120mm
Complications related to the Crosser

<table>
<thead>
<tr>
<th>Detachment</th>
<th>Complete Separation</th>
</tr>
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<tbody>
<tr>
<td>14.4%</td>
<td>0%</td>
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A predictor of detachment

**PACSSS grade 4**

(OR 14.6; CI 1.26–168.5; P = 0.032)

It is known that the detachment would occur by pushing the catheter too strongly when the shaft is stuck or trapped due to the severe stenosis or calcification.

In this situation, the tip and core wire still remains connected.
If the tip is trapped by the stenosis, the tip and core wire would be separated completely during pulling back the catheter.
Two-wire technique with a gooseneck snare

First wire
Second wire
Ballooning
Gooseneck snare
Entrapping the two wire
Tip 1.1mm
Small space
The retrieved tip

Core wire

tissue fragment
Conclusion

✓ Detachment or complete separation of the tip of a crosser catheter is one of the most serious complications in EVT.

✓ The two-wire technique with a gooseneck snare is a novel bail-out method, and can be widely adapted for various situations of this complication.
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