Drug-coated balloon therapy for nodular calcification after cal-crush technique

Koji Kuroda, MD
Hyogo Prefectural Awaji Medical Center, Hyogo, Japan
COI Disclosure

Disclosure

Speaker name: Koji Kuroda

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
Calcified lesion in periferal intervention

✓ We often come across severe calcified lesions in endovascular procedure

✓ Although, it is known that lesion calcification is one of the predictors for restenosis
Impact of calcification in endovascular therapy

- N=394, retrospective analysis
- Calcification was classified by PACSS score
- Treated by conventional balloon, BMS or DES
- PACSS grade 4 calcification was associated with clinical outcomes after EVT for de novo SFA lesions
Efficacy of drug-coated balloon on calcified lesion

- N=60, retrospective analysis
- Calcification was classified by circumferential distribution on CT angiography
- Calcification arc is associated with patency after drug-coated balloon therapy

Directinal atherectomy with antirestenotic therapy (DAART)

- N=72, retrospective analysis
- Isolated popliteal lesions
- DAART had higher primary patency rate compared with DCB angioplasty

Stavroulakis K et al. *J Endovasc Ther.* 2017;24:181-188.

Leave nothing behind with DCB in calcified lesions ⇒ Need lesion modification by atherectomy
# Atherectomy devices

<table>
<thead>
<tr>
<th>Atherectomy Type</th>
<th>Directional</th>
<th>Rotational</th>
<th>Orbital</th>
<th>Photo-ablative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device</strong></td>
<td>Silver Hawk/Turbo Hawk</td>
<td>Jetstream</td>
<td>Diamondback</td>
<td>Laser</td>
</tr>
<tr>
<td><strong>Eccentric, focal calcification</strong></td>
<td>○</td>
<td></td>
<td>△</td>
<td></td>
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<tr>
<td><strong>Thrombotic lesion</strong></td>
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<td>○</td>
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<tr>
<td><strong>Highly calcific, diffuse plaque</strong></td>
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<tr>
<td><strong>Chronic total occlusion</strong></td>
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<td>○</td>
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<tr>
<td><strong>In-stent restenosis</strong></td>
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</tbody>
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**Directional atherectomy device type is most useful to modify calcified lesions**
How to treat patients with severe calcification in Japan?

Of the Asian countries, these atherectomy devices (including directional) have not yet been licensed only in Japan.
Prevalence of nodular calcification in PAD patients is unknown

In nodular calcification cases, ballooning lead to overstretch in non-calcified tissue causing dissection and elastic recoil
Cal-crush technique

Crosser

Hard wire

POBA
Case 1

85 y.o male with claudication

~ Cal-crush and DCB therapy for the restenosis lesion after conventional balloon therapy ~
First EVT procedure without cal-crush technique

Pre

Cutting balloon (4mm) and Conventional balloon (5mm)

Post

6-month later
Second EVT procedure with cal-crush technique

JR 4.0: To direct wire to nodular calc

CROSSER: To floss bulky nodular calc

Wire: 45g hard wire

Obtained new lumen in nodular calcification

Natural lumen

Nodular calcification
Crush nodular calcification

Inflated balloon in this lumen through nodular calc

4mm scoring balloon

5mm drug-coated balloon
Post cal-crush

Pre cal-crush (6-mo later from 1st EVT)

Post cal-crush and DCB

6-month follow-up with OFDI
Case 2

82 y.o male with claudication

~ Optical frequency domain imaging findings before and after EVT procedure with cal-crush and DCB therapy ~
OFDI findings before and after cal-crush

Pre
Cal-crush + DCB

Post
Part of wire passage
Removed calcification by cal-crush
Conclusion

✓ Lesion modification by atherectomy is required to treat patients with severe calcification and atherectomy devices are useful to modify these calcified lesions.

✓ However, in the situation of which we can not use atherectomy devices, cal-crush technique is useful for lesion modification, especially in case of focal nodular calcification.
Drug-coated balloon therapy for nodular calcification in superficial femoral artery after Cal-Crush technique

Koji Kuroda, MD, PhD
Hyogo Prefectural Awaji Medical Center, Hyogo, Japan