Central wiring technique is useful for SFA occluded lesions with self ultrasonography guided method

Hideyuki Takimura
Dept. of Cardiology
Tokyo General Hospital
Tokyo, Japan
Disclosure

Speaker name: Hideyuki Takimura

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
IVUS-evaluated distal EEM area, mm$^2$, n=583: 28 ± 10
Percentage of stenosis after stent implantation: 4 ± 9
IVUS-evaluated MSA, mm$^2$, n= 597: 15 ± 4

Risk factors for restenosis were:
- lesion length of $\geq 16$ cm,
- external elastic embrane area of $\leq 27$ mm$^2$,
- minimum stent area of $\leq 12$ mm$^2$,

Post-treatment MSA
Q4, $\geq 18$ mm$^2$
Q3, 15-17 mm$^2$
Q2, 13-14 mm$^2$
Q1, $\leq 12$ mm$^2$

1.00 (Ref)
1.71 (0.86-3.42)
2.04 (1.00-4.13$^*$
5.16 (2.44-10.9$^*$)

Risk factors for restenosis were:
- lesion length of $\geq 16$ cm,
- external elastic embrane area of $\leq 27$ mm$^2$,
- minimum stent area of $\leq 12$ mm$^2$,
Background

Fig. 2. Receiver-operating characteristic analysis of the proportion via the intramedial route and distal reference lumen CSA for developing restenosis.

CSA: cross-sectional area.
AUC: area under the curve.
CI: confidence interval.
Sub. vs. Intraplaque vs. Central approach

Subintimal approach < Intraplaque wiring < Central wiring
Benefits of Ultrasound guided wiring

- Decrement of radiation exposure
- Decrement of contrast media
- Possible of wiring to the intraplaque lumen
- Only short time for passing the long CTO lesion, about 5-15 min.
- Safety of the first hard guide wire, 0.014inch GW
- Prevent complication
- Only antegrade approach
Central Wiring Technique: CWT

Don’t check the guide wire which was penetrated by operator. Our strategy is
1. Sonographer visualize the long axis view of the center of target occluded artery and hold on this view.
2. Operator penetrate with guide wire into this view as guide wire is visualized clearly.
Cross direction: US image visualized the center of the occluded artery. Operator inserts guide wire into this view as guide wire is visualized clearly. So it is possible that guide wire penetrate into the central lumen.

Cross direction is not visualized.

Longitudinal direction is visualized.
180° rotation of GW
Operator selects the route at the superior or inferior.
Wiring at cross direction

GW is penetrated into the visualized view.

Ultrasonography

Pullback
Rotation 90°
More rotation 90°
Re-insert
Wiring at cross direction

GW is penetrated into the visualized view.
Self Ultrasound Guided EVT
Self Ultrasound Guided EVT
Self Ultrasound Guided EVT
Self Ultrasound Guided EVT
Ultrasound Guided wiring for BK lesion
Patients Characteristics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td><strong>51</strong></td>
</tr>
<tr>
<td>Age [y.o.]</td>
<td>77.4±10.7</td>
</tr>
<tr>
<td>Female</td>
<td>15 (29.4%)</td>
</tr>
<tr>
<td>BMI</td>
<td>22.1±3.7</td>
</tr>
<tr>
<td>Hypertension</td>
<td>30 (58.8%)</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>35 (68.6%)</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>20 (39.2%)</td>
</tr>
<tr>
<td>Hemodialysis</td>
<td>6 (11.8%)</td>
</tr>
<tr>
<td>Cre [mg/dl]</td>
<td>1.3±1.5</td>
</tr>
<tr>
<td>eGFR [ml/min/1.73m²]</td>
<td>59.1±25.5</td>
</tr>
<tr>
<td>Critical limb ischemia</td>
<td>10 (19.6%)</td>
</tr>
<tr>
<td>Pre ABI</td>
<td>0.6±0.1</td>
</tr>
</tbody>
</table>
## Patients Characteristics

<table>
<thead>
<tr>
<th>n</th>
<th>51</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medications</td>
<td></td>
</tr>
<tr>
<td>Aspirin</td>
<td>51 (100%)</td>
</tr>
<tr>
<td>Thienopyridines</td>
<td>13 (25.4%)</td>
</tr>
<tr>
<td>Cilostazol</td>
<td>39 (76.5%)</td>
</tr>
<tr>
<td>TASC II C</td>
<td>13 (25.5%)</td>
</tr>
<tr>
<td>D</td>
<td>38 (74.5%)</td>
</tr>
<tr>
<td>Lesion diameter[mm]</td>
<td>5.0 ± 1.4</td>
</tr>
<tr>
<td>Lesion length[cm]</td>
<td>18 ± 9</td>
</tr>
<tr>
<td>EVT strategy</td>
<td>n</td>
</tr>
<tr>
<td>--------------</td>
<td>-------</td>
</tr>
<tr>
<td>Primary Approach</td>
<td></td>
</tr>
<tr>
<td>Crossover (Contralateral CFA)</td>
<td>24 (47.1%)</td>
</tr>
<tr>
<td>Antegrad (Ipsilateral CFA)</td>
<td>27 (52.9%)</td>
</tr>
<tr>
<td>Retrograde approach</td>
<td>0</td>
</tr>
<tr>
<td>No. of used guidewire</td>
<td>2.6±1.7</td>
</tr>
<tr>
<td>No. of stent</td>
<td>1.7±0.5</td>
</tr>
<tr>
<td>Self expanded bare metal stent</td>
<td>51 (100%)</td>
</tr>
<tr>
<td>Stent diameter [mm]</td>
<td>6.4±0.5</td>
</tr>
<tr>
<td>Stent length [mm]</td>
<td>222.4±90.0</td>
</tr>
<tr>
<td>Post dilatation balloon diameter [mm]</td>
<td>5.4±0.6</td>
</tr>
<tr>
<td>IVUS</td>
<td>51 (100%)</td>
</tr>
<tr>
<td>Technical success rate</td>
<td>51 (100%)</td>
</tr>
<tr>
<td>Complication</td>
<td>0</td>
</tr>
</tbody>
</table>
Root of guidewire, Radiation, Contrast

- **Subintimal ≥5cm**: 1 out of 46 patients (2.0%)
- **Subintimal <5cm**: 46 out of 46 patients (90.2%)
- **All intraplaque**: 4 out of 46 patients (7.8%)

**Dose of Radiation [mGy]**
- Mean ± SD: 211.9 ± 268.6
- Median (min, max): 104.2 (71.0, 251.1)

**Dose of Contrast Media [ml]**
- Mean ± SD: 70.5 ± 67.3
- Median (min, max): 65.3 (10, 200)
Primary Patency

- Primary Patency: 94.1%
- Re-occlusion cases: 0 case
US is not only diagnostic tool but also treatment tool.
Self ultrasound guided wiring was safety and useful.
Central wiring technique might improve patency of SFA-CTO lesions.
Central wiring technique is useful for SFA occluded lesions with self ultrasonography guided method

Hideyuki Takimura
Dept. of Cardiology
Tokyo General Hospital
Tokyo, Japan