Toolbox

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Complex Coronary Interventions

• Strategy
• Access (sheath size)
• Guiding catheter
• Material (wire, balloon, stents,...)
• Complication-management
## Accomodating capacity of guide catheters for PCI devices

<table>
<thead>
<tr>
<th>Fr.</th>
<th>Capacity and Devices</th>
</tr>
</thead>
</table>
| 5 Fr (0.056 – 0.059”) | Balloon angioplasty, DEB, most coronary stents, Kissing balloons with smaller profile balloons and 0.010” guidewire  
Rotablator brr 1.25 mm  
Some IVUS catheters (Volcano Eagle Eye® Gold / Platinum catheter; Terumo ViewIT®) |
| 6 Fr (0.068 – 0.071”) | Standard angioplasty and stenting, bifurcation angioplasty with kissing balloons  
Flextome® cutting balloon, Venture®, 6F Export® Aspiration catheter  
IVUS  
Rotablator brr 1.5 mm|
| 7 Fr (0.078 – 0.081”) | 2 monorail balloon catheters  
Rotablator brr up to 1.75 mm & 2 mm  
Simultaneous 2 stent deployment, simultaneous 2 microcatheters |
| 8 Fr (0.088 – 0.091”) | 2 OTW balloon catheters  
Rotablator brr 2.25 mm |

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**TRA for rotational atherectomy**

Table 8: Procedural Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>TRA</th>
<th>CTG</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success (%)</td>
<td>99.5</td>
<td>96.7</td>
<td>0.35</td>
</tr>
<tr>
<td>Procedure time (min)</td>
<td>112.4±10.0</td>
<td>112.4±10.0</td>
<td>0.84</td>
</tr>
<tr>
<td>Radiation exposure</td>
<td>12.0±3.9</td>
<td>12.0±3.9</td>
<td>0.84</td>
</tr>
</tbody>
</table>


**TRA for Bifurcation**


**ESC Guidelines 2015 ACS**

In centres experienced with radial access, a radial approach is recommended for coronary angiography and PCI.

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HEAVILY CALCIFIED LESION

Differences between semi-compliant and non-compliant balloons

**Semi-compliant balloon**
- Soft, flexible, low profile
- First choice for crossing tight lesions

**Non-compliant balloon**
- Robust and low growth
- Pre-dilation of fibro-calcific lesions
- Ideal for achieving stent apposition

Dogboning
Scoring Balloon
AngioSculpt® (AngioScore)

- Flexibel Nitinol-Wires
- Semi-compliant Balloon
- Crossing-Profil: 2,7F, 0.014inch

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Rotablation

ESC Guidelines
Rotablation

Guidelines on myocardial revascularization

The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Rotablation is recommended for preparation of heavily calcified or severely fibrotic lesions that cannot be crossed by a balloon or adequately dilated before planned stenting.

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Start small
1.25 mm or 1.5 mm or 1.75 mm burr

Balloon failed to dilate lesion
in the absence of a dissection start with 1.75 mm or 2.0 mm burr

Largest final burr
0.6 burr-to-artery ratio
LEFT MAIN DISEASE

- Sizing
- Strategy (One vs Two-Stent Strategy)
- Stent design
- Imaging (IVUS / OCT)
### Post-dilatation expansion and DES model designs

<table>
<thead>
<tr>
<th>Balloon Max. size</th>
<th>Element</th>
<th>Xience</th>
<th>Taxus</th>
<th>Integrity</th>
<th>BioMatrix</th>
<th>Cypher</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>2.35</td>
<td>Very small (2 cells) max expansion: 3.0mm</td>
<td>Medium vessel workhorse (6 crowns, 2 cells) max expansion: 5.4mm</td>
<td>Small vessel workhorse (8 crowns, 2 cells) max expansion: 3.4mm</td>
<td>Medium vessel workhorse (8 crowns, 2 cells) max expansion: 4.6mm</td>
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</tr>
<tr>
<td>3.0</td>
<td>2.50</td>
<td>Small vessel workhorse (8 crowns, 2 cells) max expansion: 3.0mm</td>
<td>Medium vessel workhorse (8 crowns, 3 cells) max expansion: 4.4mm</td>
<td>Small vessel workhorse (8 crowns, 2 cells) max expansion: 3.4mm</td>
<td>Medium vessel workhorse (10 crowns, 2 cells) max expansion: 3.6mm</td>
<td>Medium vessel workhorse (8 crowns, 2 cells) max expansion: 4.4mm</td>
</tr>
<tr>
<td>2.5</td>
<td>2.75</td>
<td>Medium vessel workhorse (8 crowns, 3 cells) max expansion: 4.4mm</td>
<td>Large vessel (8 crowns, 3 cells) max expansion: 5.8mm</td>
<td>Large vessel workhorse (8 crowns, 3 cells) max expansion: 4.9mm</td>
<td>Large vessel workhorse (8 crowns, 3 cells) max expansion: 5.9mm</td>
<td>Large vessel (8 crowns, 3 cells) max expansion: 5.8mm</td>
</tr>
<tr>
<td>2.0</td>
<td>3.00</td>
<td>Large vessel (18 crowns, 3 cells) max expansion: 5.4mm</td>
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- Minimal stent LO excluding struts
- Limited to 6.0 mm balloons at 14 ATM

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### EFFECTS OF LABELED MAXIMUM OVEREXPANSION

**Resolute Onyx™ 5.00 x 18 mm DES deployed to 5.75 mm**
- Average farspreading at 5.75mm 0.8%
- Average farspreading at 5.75mm 16.6%

**Promus Premier™ 4.00 x 20 mm DES deployed to 5.75mm**

Resolute Onyx DES and Promus Premier DES are labelled to a maximum overexpansion of 5.75 mm per the IFU.
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- **XIENCE Sierra**
  - 25x magnification at max expansion of 5.5 mm
  - Coating remains intact at maximum post-dilatation expansion of 5.5 mm from 3.5 mm

- **SYNERGY**
  - 25x magnification at max expansion of 4.25 mm
  - Coating shows multiple cracks with delamination at its max expansion of 4.25 mm from 3.5 mm

- **Resolute Onyx**
  - 25x magnification at max expansion of 4.75 mm
  - Coating peels off and shows exposed metal at its max expansion of 4.75 mm from 3.5 mm

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CTO

- Bilateral access to visualize the wire position and wire progress
- Maximum back-up by guide catheter
- Microcatheter over the wire approach essential
Microcatheter

- Better steerability & less friction
- Advance in tortuous proximal vessel with soft tipped wire shaped
- Exchange at proximal cap for CTO wire
- Reshape CTO wire if necessary (will lose tip curve)
- Exchange CTO wire if necessary
- After exit of distal cap change to atraumatic wire again
Current step-up GW strategy for Antegrade CTO-PCI

- DRILLING (controlled)
- PENETRATION
- SLIDING

Sliding technique

Wiring along microchannel

- Polymersleeve, tapered tip, low tipload
- ASAHI Fielder XT, XT-A, XT-R

• Anti kinking structure
• Higher torque performance with W coil

ASAHI Sion, Abbott Pilot 50 / 150
**Drilling (controlled)**

**Gaia wire concept: Deflection & Rotational control**

Intentional control through deflection to stay true lumen

**Gaia wires**

**GAIA Basic structure**

<table>
<thead>
<tr>
<th></th>
<th>ASAHI intecc; Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Length</td>
<td>1900mm</td>
</tr>
<tr>
<td>Coil Length</td>
<td>150mm</td>
</tr>
<tr>
<td>First:</td>
<td>0.26mm (0.010inch)</td>
</tr>
<tr>
<td>Second:</td>
<td>0.28mm (0.011inch)</td>
</tr>
<tr>
<td>Third:</td>
<td>0.30mm (0.012inch)</td>
</tr>
</tbody>
</table>

Various lineups for the different situation or lesion:

- **ASAHI Gaia First**
  - Diameter: 0.26mm - 0.36mm
  - Tip load: 0.7gf

- **ASAHI Gaia Second**
  - Diameter: 0.28mm - 0.36mm
  - Tip load: 3.5gf

- **ASAHI Gaia Third**
  - Diameter: 0.30mm - 0.36mm
  - Tip load: 4.5gf

Long hydrophilic coating that enhance the smooth controllability in micro catheter.
Penetration Technique

- Steel coil, tapered, high tip load
- ASAHI Confianza Pro, Confianza Pro 12

- Similar structure and tip stiffness as Conquest with SLIP-COAT™ coating for lubricity. The distal tip is not coated to allow it to catch on the entry point of the lesions.

- A tapered tip with 12g tip load. For penetration of calcification and proximal or distal thick, fibrous caps.
Which wire to use when

Stiffer tip

- Fielder XT
- ASAHI Gaia First
- ASAHI Gaia Second
- Miracle 6
- ASAHI Gaia Third
- Miracle 12
- Confianza Pro
- Confianza Pro 12
- Confianza Pro
- Confianza Pro
- Confianza Pro
- Confianza Pro
- Confianza Pro 12
- Confianza Pro

Avoid the following mistakes:

- All operators perform cto`s
- No consistent structure
- Different materials were used
- No contralateral injection
- No standardized pre-diagnostic
<table>
<thead>
<tr>
<th>Procedure</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
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<tbody>
<tr>
<td>Coro</td>
<td>4712</td>
<td>4913</td>
<td>4909</td>
<td>5130</td>
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<tr>
<td>PCI</td>
<td>2478</td>
<td>2588</td>
<td>2650</td>
<td>2750</td>
</tr>
<tr>
<td>TAVI</td>
<td>99</td>
<td>150</td>
<td>175</td>
<td>260</td>
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<tr>
<td>Mitraclip</td>
<td>22</td>
<td>38</td>
<td>49</td>
<td>64</td>
</tr>
</tbody>
</table>
Thank you!