My guidewire algorithm for below the knee success

Daniel van den Heuvel, MD
Interventional Radiologist
St Antonius Hospital,
Nieuwegein, The Netherlands
Disclosure

Speaker name:

Daniel A.F. Van den Heuvel

I have the following potential conflicts of interest to report:

Speakers fee, Asahi Intecc Co., Ltd
Preparing my typical CLI case

- Secure inflow
- Long sheath (4-6Fr) 55cm at P2-P3
- DSA 2 planes; including the foot In LAT and AP
- Assess calcium load and type
- Define targets
- Know the anatomy and anatomic variants
  - Marco Manzi et al. Radiographics 2011
  - Kawarada et al. Catheterization and Cardiovascular Interventions 2010
My crossing strategy in BTK disease

1. Antegrade approach
   a. Intraluminal
   b. Subintimal

2. Retrograde approach
   a. Distal tibial access
   b. Pedal-plantar loop
   c. Trans collateral
My crossing strategy in BTK disease

CTOP Classification

Guide wire selection

- What is the goal?
  - To access the lesion (engaging the cap or stenosis)
  - To cross the lesion
  - To deliver devices

- Antegrade or retrograde approach

- Building blocks of the wires determine characteristics
Guide wire building blocks

Determines to a great extent the wire properties:
Thicker wires: more pushability and better support
more durability
less flexibility
Shorter Taper

Prolapse
Longer Taper

Successful Tracking
Guide wire building blocks

Coil

Offers flexibility and support
Provide tactile feedback
Retain GW diameter
Guide wire building blocks

Coating

Affects lubricity
Tactile feedback
Hydrophilic coating: less tactile feedback, high lubricity
Hydrophobic coating: vice versa
Two types of wires: tapered & non-tapered
Guide wire characteristics

- Torque:
  - Rotational force applied at a proximal end of a GW transmitted to the distal end of the wire
  - Influenced by the core: diameter, material flexibility and welding points

- Tip Durability:
  - Ability of the GW to keep tip integrity when crossing lesions
  - Influenced by the core material flexibility, core diameter and coils
Guide wire characteristics

- **Penetration power:**
  - The force the GW tip has measured in gram per square inch
  - Influenced by the core material, tip load and tip diameter

- **Support:**
  - Stiffness of the GW which provides the ability to deliver devices without kinking or bulking
  - Influenced by the core material flexibility, diameter and grinding
GW algorithm for crossing BTK disease

WH GW
Successful crossing

Use support catheter
Switch to higher penetration GW

no

yes

Continue with WH GW
to navigate and facilitate device delivery
Workhorse Guide wire: ASAHI Gladius

ASAHI Gladius 0.014

- Balanced support shaft design for good push force transmission and maneuverability
- High durability = Multiple Vessels, Multiple Lesions

Polymer Jacket + Hydrophilic* Coating (40cm)

Tip Load 3.0 gf

Coated with SLIP-COAT® coating.

Illustration and figures are for reference only.

Coated with SLIP-COAT® coating.
### Workhorse Guide wire: Tip load

#### Tip load (gf)

0.014” Moderate tip load as an utility guide wire

<table>
<thead>
<tr>
<th></th>
<th>ASAHI Gladius 0.014</th>
<th>Regalia XS 1.0</th>
<th>Competitor A</th>
<th>Competitor B</th>
<th>Competitor C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.0</td>
<td>1.0</td>
<td>2.6</td>
<td>1.9</td>
<td>2.9</td>
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</tbody>
</table>

*The above data was obtained by company standardized test, which may differ from industry standardized tests.*

*The above data does not prove that all devices have exactly the same performance with the samples used for these tests.
Workhorse Guide wire: Support

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**Workhorse Guide wire: Tip durability**

**Knuckle Wire Simulation**

ASAHI Gladius 0.014

Push strength of knuckled wire

The strength of push force in knuckle wire
(On the supposition that Regalia XS 1.0 is 1)

<table>
<thead>
<tr>
<th>Push force</th>
<th>ASAHI Gladius 0.014</th>
<th>Regalia XS 1.0</th>
<th>Competitor1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>Strong</td>
<td>Weak</td>
<td>Weak</td>
</tr>
</tbody>
</table>

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High tip durability

Composite Core prevents the wire crush and it is useful for occluded lesions and multi vessel disease.

**Workhorse Guide wire: Tip retention**

**Needed force until crush**
*(On the supposition that Regalia XS 1.0 is 1)*

![Crush test diagram]

<table>
<thead>
<tr>
<th></th>
<th>ASAHI Gladius 0.014</th>
<th>Regalia XS 1.0</th>
<th>Competitor1</th>
<th>Competitor2</th>
</tr>
</thead>
</table>

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Workhorse Guide wire: Lubricity

Able to cross into lesion smoothly = Lubricity

Lubricity
Higher

ASAHI Gladius 0.014  Regalia XS 1.0  Competitor1  Competitor2

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GW algorithm for crossing BTK disease

Gladius 0.014
Successful crossing

Use support catheter
Switch to higher penetration GW

yes

no

Continue with Gladius 0.014 to navigate and facilitate device delivery

Higher penetration GW

HALBERT
0.014
ASTATO XS
20
ASTATO XS
Specialty Guide wire My First Escalation

ASAHI Halberd 0.014

Hydrophilic* Coating on Spring Coil and Wire (33cm)

- Improved torque response, easy navigation and penetration capacity

Illustration and figures are for reference only. Coated with SLIP-COAT® coating.
Mini pre-shape Armored tip

Soldered from the pre-shaped part until the ball tip

Easy directional control in calcified occluded lesions due to superior tip shape retention
Specialty Guide wire: Support

Suitable for tortuous vessel and cross over approach due to the smooth shaft design for 1:1 push force transmission.

Stiffness
Higher

Easy push force transmission due to balanced support shaft design.

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### Specialty Guide wire: Tip load

<table>
<thead>
<tr>
<th>Device</th>
<th>Tip Load (gf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASahi Halberd 0.014</td>
<td>12</td>
</tr>
<tr>
<td>Treasure XS 12*</td>
<td>12</td>
</tr>
<tr>
<td>Confianza Pro 12</td>
<td>12</td>
</tr>
<tr>
<td>Competitor A</td>
<td>13</td>
</tr>
<tr>
<td>Competitor B</td>
<td>12</td>
</tr>
<tr>
<td>Competitor C</td>
<td>18</td>
</tr>
</tbody>
</table>

*Treasure XS 12 is available only in Japan.

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Specialty Guide wire

Astato XS 20

- For calcified lesions
- High penetration capacity due to thick core and tapered tip
**Specialty Guide wire**

**Astato XS 40**

*Hydrophilic* Coating on Spring Coil (17cm)

- **Tip Load**: 40.0 gf
- **Hydrophilic Coating**
- **Tapered Ball Tip**

For calcified lesions

High penetration capacity due to thick core and tapered tip
My crossing strategy in BTK disease

1. No or limited calcium
   a. Intra luminal: Gladius 0.014 escalation to Halbert 0.014
   b. Subintimal: 0.035 hydrophilic

2. Severe calcium
   a. Gladius 0.014 early escalation to Halbert 0.014
   b. Astato XS 20 or 40
   c. Subintimal: 0.035
My crossing strategy in BTK disease

1. Short lesions
   a. A lot of effort to stay intra luminal

2. Long lesions
   a. Effort to stay intraluminal
   b. Early escalation to subintimal
CTO wire techniques

**Gladius 0.014** Sliding or controlled drilling

**Halbert 0.014** Penetrating

**Astato XS 20 and 40** Penetrating

**Regalia XS 1.0** Controlled navigating, sliding
GW selection when 0.014 fails

Try more support with balloon catheter, support catheter

Switch to 0.018 or 0.035 platforms
Case Gladius 0.014 BTK occlusion
Case Gladius 0.014 BTK occlusion
Cases Regalia XS 1.0 pedal navigation
Cases Regalia XS 1.0 pedal navigation
Cases Regalia XS 1.0 pedal navigation
Failure of antegrade intra luminal navigation

Perforation after 0.014 Gladius and Halbert
Re-entry with Hydrodynamic boost and Regalia XS 1.0
Conclusions

- If you know the GW characteristics
- And tailor GW per situation
- You will work successfully, fast and cost effective
- With 4 types of 0.014 GW and a bail out 0.018 and 0035 GW
My guidewire algorithm for below the knee success

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