Efficient Endoleak Treatment with Penumbra Large Volume Coils

30.1—2.2.2018
Trade Fair Leipzig, Hall 2
Messe-Allee 1, 04356 Leipzig, Germany

Programme

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Disclosure

Consultant for:
Abmedica
Bard
Boston Scientific
Gore
Medtronic
Penumbra
RUBY™
Large Volume Detachable Coil
Why choose Penumbra large volume detachable Devices for Endoleak treatment?

- For the large volume filling
- For the packing density
- For the softness
Physical Properties of Coils

\[ D_1 = \text{Diameter of the stock wire (primary structure)} \]

\[ D_2 = \text{Diameter of the first coiling (secondary structure)} \]

\[ D_3 = \text{Diameter of the second coiling (tertiary structure)} \]
1 For the large volume filling
Usually all the microcatheter deliverable coils have a diameter:

from 0.010” to 0.014”

(Secondary structure)

Penumbra diameter is 0.020”
## VOLUME ADVANTAGE

<table>
<thead>
<tr>
<th>Coil</th>
<th>Coil Thickness</th>
<th>Longest 4 mm Coil</th>
<th>Longest 8 mm Coil</th>
<th>Longest 12 mm Coil</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Penumbra Ruby™ Coil</strong></td>
<td>.020&quot;</td>
<td>1 Ruby 4 mm × 35 cm</td>
<td>1 Ruby 8 mm × 60 cm</td>
<td>1 Ruby 12 mm × 60 cm</td>
</tr>
<tr>
<td><strong>Covidien Concerto™ / Axium™</strong></td>
<td>.0125&quot;-.0145&quot;</td>
<td>9 coils = 1 Ruby 4 mm × 10 cm</td>
<td>4 coils = 1 Ruby 8 mm × 30 cm</td>
<td>3½ coils = 1 Ruby 12 mm × 30 cm</td>
</tr>
<tr>
<td><strong>Boston Scientific Interlock™</strong></td>
<td>.012&quot;</td>
<td>6½ coils = 1 Ruby 4 mm × 15 cm</td>
<td>8 coils = 1 Ruby 8 mm × 20 cm</td>
<td>3½ coils = 1 Ruby 12 mm × 50 cm</td>
</tr>
<tr>
<td><strong>Terumo Azure CX Hydrocoil</strong></td>
<td>.014&quot;-.015&quot;</td>
<td>5½ coils = 1 Ruby 4 mm × 13 cm</td>
<td>5 coils = 1 Ruby 8 mm × 24 cm</td>
<td>3 coils = 1 Ruby 12 mm × 34 cm</td>
</tr>
<tr>
<td><strong>Codman Helipaq®</strong></td>
<td>.014&quot;</td>
<td>7 coils = 1 Ruby 4 mm × 10 cm</td>
<td>4 coils = 1 Ruby 8 mm × 30 cm</td>
<td>4 coils = 1 Ruby 12 mm × 30 cm</td>
</tr>
</tbody>
</table>
Volume Advantage

- Reduce the number of coils per case
- Reduce procedure time and radiation exposure
2 For the packing density
The Importance of $D_2$ for the packing density

Stiffness = \( \frac{D_1^4 \cdot G}{8 \cdot D_2^3 \cdot n} \)

With the same stock wire....

0.010 inch  0.012 inch  Packing Attenuation  +43% ↑
3 For the softness
The Importance of $D_1$ for the softness

$$\text{Stiffness} = \frac{D_1^4 G}{8 D_2^3 n}$$

$G$ = Shear modulus (almost constant for metal used)

$n$ = number of wraps per unit distance

With the same $D_2$....

0.003 inch $\rightarrow$ 0.0015 inch

Stiffness reduction from 9 to 1

$800\% \approx \text{stiffness reduction}$ !!!!!!
CLINICAL CASES
CASE 1
Male, 80 years
Previous aorto-bisiliac endoprosthesis placement
CT evidence of type 1 endoleak
Pigtail aortography showing the presence of type 1 endoleak.

Medium contrast injection into the aneurismatic sac.

Superselective of the aneurismatic sac with an high flow microcatheter.
Type 1 endoleak embolization with Penumbra coils

Coils total length: 627 cm
Coils releasing time: 45 min
Total procedure time: 70 min
Final control after Penumbra coils embolization
CASE 2
Male, 47 years
Previous aorto-bisiliac endoprothesis placement 3ys before CT evidence of type 2 endoleak
There was no way to reach the leak through the SMA with microcatheter and microwire.
We decided to pass between the endoprosthesis and the native iliac artery from the right femoral approach.
We decided to pass between the endoprosthesis and the native iliac artery from the right femoral approach.
Direct embolization with Ruby coils.
One-year follow-up Computed Tomography
CASE 3
Male, 77 years
2011 - aorto-bisiliac endoprosthesis placement
CT evidence of sac enlargement and unknown origin endoleak
We decided to perform a trans-caval approach
Final control
CASE 4

Male, 73 years

Previous double Nellix Placement with chimney for SMA and right renal artery in another hospital.

Admitted in emergency in our Department for suspected aortic rupture in type 1 endoleak.
Leak Embolization
Leak Embolization
Final Control
Take Home Points

• Leak Embolization with Penumbra RUBY Large Volume detachable coils or PPC is an easy and safe option
• Gives you the opportunity to save time with their long length, and high packing density
• Less time needed for embolization can be translated with:
  Less radiation exposure for the patient and the operators.
  Less contrast medium somministration.
  Less number of coils for each procedure
THANKS FOR YOUR ATTENTION
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