Update on the sandwich technique for treating complex TAAAs: Technical tips, precautions, and results

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São Paulo Vascular & Endovascular Institute (ICVE-SP), São Paulo, Brazil

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April, 3-5, 2019

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Nothing to Disclose
Sandwich Graft

Technique:

Aortic Arch
Type I or II
Both Subclavian A. Open
No LIMA Bypass

Proximal Neck
≥ 15mm in Length
≤ 40 mm in Diameter
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Technique:

First Thoracic Endograft
Conformable and Flexible
No Proximal Freeflo
Long Endograft ≥ 20cm
Finishing 1-2cm above CT

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**Vascular Access**

- **4 Vessels Revascularization**
  - Left Subclavian Open Aproach
  - R brachial Punction & Femoral Punction
  - One 20Fr Sheath (28cm)
  - Four 7-8Fr Long Sheath (90cm)

- **2-3 Vessels Revascularization**
  - Left Subclavian Open Aproach
  - R brachial Punction
  - One 20 Large Sheath (28cm)
  - Two/Three 7-8F Long Sheath (90cm)

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**Target Vessel**

- **Diagnostic Catheter**
  - VERT, MP, IM, Berestein, Simmons
  - 5F 110 or 125cm long

- **Guide wire**
  - Cannulation: Terumo Stiff 0.035 260cm
  - Exchanged: Extra stiff 0.035 260cm
  - Short Floppy Tip (Amplatz)

- **Sheath**
  - Inside TV 2-3cm
  - Be careful w/ SMA & CT side branched
**Sandwich Graft**

**Technique:**

**SECS**
- Conformable and Flexible
- Good Redial Force
- Adequate Visibility
- Options in Size and Length
  - 1mm bigger than the TV
  - 2cm inside the TV
  - 6cm inside the first thoracic Endograft
  - In General w/ 100-150mm in Length
- All Undeployed

**Abdominal Endograft**
- Main Body Deployment
- Below the Lowest Renal A.
- Proximal Diameter < Thoracic Endograft
- Iliac Limb End above the Iliac Bifurcation

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Technique:

Second Thoracic Endograft
30% Oversizing then the 1st One
5cm Overlapping of the SECS
SECS 1cm above the 2nd One
5cm Overlapping of the Abdominal Endograft
Sandwich Graft

Technique:

Second Thoracic Endograft
Endograft Deployment
Retrieve Sheath inside the TV
All SECS Undeployed
Latex balloon Accomodation
Mainly in the Overlapping (SECS, Endografts)
Sandwich Graft

Technique:

SECS Deployment
Bare Stent Inside Is Not Mandatory
SECS Angioplasty Is Not Mandatory

Abdominal Endograft
Contralateral Limb Deployment
Iliac Limb End above the Iliac Bifurcation
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Technique:

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First Thoracic Stent-graft

Second Thoracic Stent-graft

Viabahn

Sandwich Graft

Technique:
Sandwich Graft

Technique:

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Second Thoracic Stent-graft

Viabahn

Sandwich Graft

Technique:
Sandwich Graft

Technique:

Flexible Stent-graft
5 cm overlapping

bridge Stent
Good radial force
and flexibility
Sandwich Graft
Parallel Endografts Indications:

- Previous EVAR/TEVAR
- Urgent Setting (symptomatic, rupture, rapid grown & aneurysm size ≥ 70mm)
- Type B Aortic Dissection With Narrowed TL
- Very Tortuous TAAA at Visceral Level
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Previous EVAR/TEVAR & Urgent Setting
Sandwich Technique

Previous EVAR/TEVAR & Urgent Setting

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Previous EVAR/TEVAR & Urgent Setting

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Type B Aortic Dissection With Narrowed TL
Sandwich Technique

Type B Aortic Dissection With Narrowed TL
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All Together

Debranching

TBAD

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Narrow TL

BMS Overlapping The Visceral Ostium

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Celiac Trunk
RRA with retrograde flow
SMA
RRA with retrograde flow
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Very Tortuous TAAA at Visceral Level

Iliac Aneurym w/ iliac limb migration

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Celiac Trunk

SMA

Art. Mesentérica Superior

0.64 cm

4.04 cm

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RRA

Art. Renal Esq.

6,01 cm

5,37 cm

LRA

Art. Renal Esq.

0,45 cm

5,71 cm

4,53 cm

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LCIA

HA

Length: 2.133 cm

Length: 4.937 cm
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CT

SMA

LRA

RRA

RF
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CT
SMA
LRA

RRA
LHA

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RRA

LHA

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# Sandwich Technique

## Limitations - Exclusion Criteria:

**Table 1. Patient Selection Criteria for the Sandwich Technique**

<table>
<thead>
<tr>
<th>FIT</th>
<th>UNFIT</th>
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</thead>
<tbody>
<tr>
<td><strong>TAAA repair</strong></td>
<td></td>
</tr>
<tr>
<td>- Unfit for open surgery</td>
<td>- Previous bilateral LIMA bypass</td>
</tr>
<tr>
<td>- Urgent setting (rupture, rapid growth, aneurysm size ≥ 70 mm)</td>
<td>- Previous aortic arch debranching</td>
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<tr>
<td>- Type B aortic dissection with narrow true lumen</td>
<td>- Bilateral subclavian artery occlusion</td>
</tr>
<tr>
<td>- Very tortuous TAAA at visceral level</td>
<td>- Type III aortic arch</td>
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<tr>
<td></td>
<td>- Descending TAA with no proximal neck</td>
</tr>
<tr>
<td></td>
<td>- Visceral arteries &lt; 4 mm in diameter</td>
</tr>
<tr>
<td><strong>AIA repair</strong></td>
<td></td>
</tr>
<tr>
<td>- No bilateral distal CIA landing zone</td>
<td>- HA &lt; 4 mm in diameter</td>
</tr>
<tr>
<td>- No unilateral distal CIA landing zone plus contralateral HAA or contralateral HA with previous occlusion/severe stenosis</td>
<td>- Poor HA runoff</td>
</tr>
<tr>
<td>- AAA with bilateral, short, healthy CIA (no bilateral distal landing zone)</td>
<td>- Severe HA ostial stenosis (&gt; 80%)</td>
</tr>
</tbody>
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Limitations - Relative Exclusion Criteria:

- Crossover Fem-Fem bypass
- SCA extra-anatomic bypass
- Bilateral hypogastric artery occlusion
- Shaggy aorta and supra-aortic vessels
- Concomitant aortic arch aneurysm
Sandwich Technique

Disadvantages:

- A few number of publications
- Long-term follow-up is missing
- It is Not a standardize procedure
The Sandwich Technique facilitates safe and effective aneurysm exclusion and target vessel revascularization in adverse anatomical scenarios, with sustained durability in midterm follow-up.
SAVE THE DATE

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