What Defines Chronic Type B Aortic Dissection
When and How it Should be Treated
Conservatively; By TEVAR; By Open Repair

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Disclosures

- W.L. Gore & Associates - Membership on Advisory Committee or Review Panels, Primary Investigator
- Medtronic – Primary Investigator
- Cook – Sub Primary Investigator

Thoracic Aortic Dissection:
Total Understanding

The Type B Dissection “Universe” as presented to the CV surgeon on a daily basis

1. Acute Type B Dissection: Complicated
2. Acute Type B Dissection: "High Risk" Un-Complicated
   1. High risk for LATE distal Aortic complications
3. Acute Type B Dissection: Un-complicated
4. Chronic Type B Dissection: deNovo or Classic
5. Chronic Type B Dissection: Residual Type A Dissection
   1. Late Chronic Type B AFTER previous Type Repair
6. Acute Type A "Adjunct" Frozen Elephant trunk

EXTENT OF DISSECTION: DEBAKEY TYPE III A vs III B

• Implications for TEVAR

Acute Type B “Complicated” with Distal Aortic Remodeling: It all started with the early pictures

Inevitable that progress would continue!!

Fundamental Concepts

- Wire access in TRUE lumen
  - Use of IVUS if confirmation needed
- Cover the primary tear site and as many smaller distal re-entries as possible
- Expand the true lumen
- Initiate thrombosis and obliteration of false lumen
Or …….

Dacron Zone 2 or 3 LZ "prepared"

Residual Type B Dissection AFTER completion of Primary Type A: Chronic

Patient /Anatomy Selection

Role of TEVAR in Chronic Type B aortic dissection with Aneurysm

- Can we do it (and safely)?
- What happens to the distal aorta (i.e. aortic remodeling)?
- Does it translate into survival benefit?

Predictors of Positive Aortic Remodeling with TEVAR

- Reasonable size true lumen
- Minimal fenestrations in distal thoracic aorta

TEVAR Promotes Successful Thoracic Aortic Remodeling In The Treatment Of Aneurysms Secondary To Chronic DeBakey Type III Aortic Dissection

BG Leshnower, WY Szeto, A Pochettino, ND Desai, DP Nathan, BM Jackson, RM Fairman, JE Bavaria

Presented Society of Thoracic Surgeons (STS) 2013
Ann Thor Surg 2013

Chronic Distal Aortic Dissection after previous Type A: TEVAR
Thrombosis of FL

Predictors of Poor Aortic Remodeling with TEVAR

Complex multiple fenestrations in distal thoracic aorta

All 4 visceral branches NOT from TL

Continued Distal Aortic Degeneration

False Lumen Thrombosis

<table>
<thead>
<tr>
<th>Series</th>
<th>Thoracic (only)</th>
<th>Thoracic+ Abdominal</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n=31)</td>
<td>27 (87%)</td>
<td>2 (6%)</td>
</tr>
<tr>
<td>IIIa (n=12)</td>
<td>12 (100%)</td>
<td>N/A</td>
</tr>
<tr>
<td>IIIb (n=19)</td>
<td>13 (79%)</td>
<td>2 (11%)</td>
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Safety and Efficacy: Chronic Type B and TEVAR

N=51 (all chronic type B dissection)
- Mean diameter 6.2 cm
- Mean followup 27 months
- No 30-day mortality
- 87% complete remodeling
- Overall diameter 6.2 → 5.0 cm

Duke Heart Center

Thoracic Endovascular Aortic Repair for Chronic DeBakey Type IIIb Aortic Dissection

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False Lumen
Thoracic: Thrombosed
Abdominal: Patent

S/P DeBakey Type I
s/p Asc/Hemi

C-TAG for
Dissection: To
Celiac
Total Thoracic + Abdominal False Lumen Thrombosis

Note: ALL 4 “VISCERAL”
segment arteries off the
TRUE LUMEN.

Remodeling Failures (4/31): Post TEVAR
Patent Thoracic + Abdominal False Lumen

N=4 IIIb
• Iatrogenic Injury (n=1)
• 6 Viscerals off TL (n=1)
• 2-3 Viscerals off TL (n=2)

Open TAAA Misconception:

TAAA Chronic Dissection is Very different than TAAA Atherosclerotic Aneurysm

Results are better
Important: Survival and TAAA Dissection (Open)

Note: TAAA for Dissection IS LESS MORBID than for Atherosclerotic aneurysm

Example: Dissection DHCA Results: Considerations

- Corvera and Fehrenbacher 2012
  - N= 93 Chronic Dissections; mean age = 60
    - 50/50 Residual Type A vs Denovo Type B
    - 100% DHCA
    - 40% Type II
  - Mortality = 2.2% (less than their non-dissected TAAA; 93/343)
  - Paraplegia = 1%
  - 8.8% Re-intervention at mean 54 months

Results: Chronic dissections Penn Series
Concurrent Series, “TEVAR Era” (2005-2014)

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<td>Death</td>
<td>6 (7%)</td>
<td>1 (1.9%)</td>
<td>0.37</td>
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<tr>
<td>Spinal Drain</td>
<td>69 (85%)</td>
<td>26 (50%)</td>
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<tr>
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<td>9 (12%)</td>
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Our Approach and Algorithm towards Chronic Type B Dissection TAAA?

- As many Abdominal Vessels off True lumen as Possible. Best is ALL 4 (Celiac, SMA, both Renals). This anatomy Minimizes distal large re-Entry sites
- Solid (Good) Caliber Proximal LZ
- Large Primary Tear site or Fenestration that can be Covered by TEVAR Proximally
- No “Pseudo-Coarctation” of Distal LZ

OPTIMIZATION of TEVAR Results in Chronic Type B Dissection: Anatomic Constraints

Notes of Engagement:

- Survival and TAAA Dissection (Open)
Pre & Post TEVAR Implantation: It started with Pictures like this!

Complicated Rupture

Early TAG in 04-01 trial

Excellent Aortic Remodeling!!

Chronic Type B aortic dissection: Again all 4 vessels off true lumen

Pre-stenting

Post-stenting

“The Treatment is best provided by specialists who are great open surgeons
AND great endovascular surgeons”

Juan Parodi, MD; STS 2006

Thank You