Aortic dilatation following Type B aortic dissection: A single-centre retrospective study

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Disclosure

Speaker name:

Kitty Hiu Fung Wong
(4th year medical student)

☒ I do not have any potential conflict of interest to report.
## Background

*For uncomplicated type B aortic dissection (TBAD):*

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; line: Medical therapy.</td>
<td>TEVAR + OMT → Improved 5-year outcomes and aortic remodelling; <em>early hazards</em>.</td>
</tr>
<tr>
<td><strong>Progressive dilatation.</strong></td>
<td></td>
</tr>
</tbody>
</table>

- Patients at risk may benefit from prophylactic TEVAR.
- Limited evidence for predictive factors.
Study Aim

To investigate clinical and radiological factors associated with aortic growth and freedom from intervention in type B aortic dissection.
Methods

**Patient selection**
- Retrospective consecutive patient cohort; single tertiary vascular centre.
- Uncomplicated TBAD presenting from Dec 2007 to Feb 2018.
- Imaging studies - CT/MRI available for review.

**Imaging analysis**
- Maximum thoracic & abdominal aortic diameters.
  - Measured at presentation and yearly follow-up.
  - **Annual aortic growth rate (AGR)** calculated.
- False lumen (FL) - patent, partial or completely thrombosed.

**Statistical analysis**
- **Linear regression analysis**: Factors affecting aortic growth rate.
- **Kaplan-Meier**: Freedom from aneurysmal dilatation (≥55mm) and intervention.

*SPSS v24.0. 2-sided, .05 significance.*
Results

**Patient demographics**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>62</td>
</tr>
<tr>
<td>Male</td>
<td>42</td>
</tr>
<tr>
<td>Marfan’s</td>
<td>9</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>63.4±12.9</td>
</tr>
<tr>
<td>False Lumen Status</td>
<td></td>
</tr>
<tr>
<td>Patent</td>
<td>39 (63%)</td>
</tr>
<tr>
<td>Partial Thrombosis</td>
<td>13 (21%)</td>
</tr>
<tr>
<td>Complete Thrombosis</td>
<td>10 (16%)</td>
</tr>
</tbody>
</table>

**Median follow-up (months)**

30.5(IQR:56.8)
Results

Mean aortic diameter (mm)

- Medical therapy: 37.4 ± 9.9
- TEVAR: 44.3 ± 13.3
  - p < .001

Aortic-related events N (%)

- Rupture, Death: 2 (3%)
- Dilatation ≥ 55mm: 30 (48%)
- Intervention (TEVAR): 21 (34%)

Mean Aortic Growth Rate (mm/year)

- Medical therapy: 3.2 ± 5.8
  - p < .001
- Intervention TEVAR: -2.6 ± 4.0
## Multivariate regression analysis: Annual aortic growth rate

<table>
<thead>
<tr>
<th>Variable</th>
<th>Adj. estimated difference (mm/year)</th>
<th>95% Confidence Interval</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower Limit</td>
<td>Upper Limit</td>
</tr>
<tr>
<td>Age (years)</td>
<td>-0.2</td>
<td>-0.3</td>
<td>-0.1</td>
</tr>
<tr>
<td>Complete FL thrombosis</td>
<td>-6.0</td>
<td>-9.3</td>
<td>-2.8</td>
</tr>
<tr>
<td>Partial FL thrombosis</td>
<td>3.0</td>
<td>0.3</td>
<td>5.6</td>
</tr>
<tr>
<td>Marfan’s Syndrome</td>
<td>-2.5</td>
<td>-5.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Initial aortic diameter</td>
<td>0.1</td>
<td>-0.03</td>
<td>0.3</td>
</tr>
<tr>
<td>Male gender</td>
<td>-1.0</td>
<td>-3.6</td>
<td>1.7</td>
</tr>
</tbody>
</table>
Results

Freedom from dilatation $\geq 55\text{mm}$

At risk

<table>
<thead>
<tr>
<th>Follow-Up Time (months)</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 years</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3 years</td>
<td>50%</td>
<td></td>
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</tbody>
</table>

Median time to dilatation: 27.2 months

Greater freedom from dilatation: Complete false lumen thrombosis (p=.030) Marfan’s syndrome (p<.001)

Freedom from intervention (TEVAR)

At risk

<table>
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<th>Follow-Up Time (months)</th>
<th>0</th>
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<tr>
<td>2 years</td>
<td>81%</td>
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<td></td>
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</tr>
<tr>
<td>3 years</td>
<td>71%</td>
<td></td>
<td></td>
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</tbody>
</table>
Results

8 (13%) Spontaneous TBAD resolution & aortic remodeling without intervention.

All observed ≤ 9 months of presentation.

Associated with:
- Complete false lumen thrombosis (p < .001)
- Female sex (p = .045)

Thoracic remodelling more favourable than abdominal with both spontaneous resolution and TEVAR. (p < .05)
Summary

• Progressive aortic expansion on medical therapy.

• Reduced expansion and aortic remodelling post-TEVAR.

• Increased aortic growth rate with:
  • Partial false lumen thrombosis
  • Younger age

• Greater freedom from dilatation ≥55mm:
  • Complete false lumen thrombosis
  • Marfan’s syndrome
Limitations

• Small sample size for some subgroups e.g. Marfan’s.
• Methodology assumed linear aortic growth.
• Intramural haematoma (IMH) included.
Conclusion

Further evidence in support of preemptive TEVAR in patients with TBAD and early predictive variables for aortic dilatation.
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