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# OUTCOMES OF THORACIC ENDOVASCULAR AORTIC REPAIR FOR TYPE B AORTIC DISSECTION: A TWENTY-YEAR SINGLE-INSTITUTION SERIES OF 318 PATIENTS

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# TEVAR for Type B Aortic Dissection

- Thoracic endovascular aortic repair (TEVAR) has become the first line treatment for complicated acute and subacute type B aortic dissection (TBAD)
- Meanwhile, the indication and timing of TEVAR for uncomplicated, high risk, and chronic TBAD are still being investigated
- This study aims to evaluate the how timing of TEVAR and complicated status of TBAD affect patient outcomes in a large longitudinal single-institution series

# A 20 Year Experience at a Single Institution

- 318 patients who underwent TEVAR for TBAD between March 2003 to May 2023
- TEVAR timing classified as acute (<14 days), subacute (14-90 days), and chronic (>90 days)
- Complicated, high-risk, and uncomplicated dissections were defined according to the most recent SVS/STS reporting standards for TBAD
  - High risk features were recorded at the initial presentation and diagnosis
  - Operative urgency (elective, urgent, emergent, and salvage) were also recorded.
  - Intraoperative, postoperative, and long-term outcomes were compared between groups.

| |
|---|
| Uncomplicated |
| No rupture |
| No malperfusion |
| No high-risk features |
| High risk |
| Refractory pain |
| Refractory hypertension |
| Bloody pleural effusion |
| Aortic diameter >40 mm |
| Radiographic only malperfusion |
| Readmission |
| Entry tear: lesser curve location |
| False lumen diameter >22 mm |
| Complicated |
| Rupture |
| Malperfusion |

Lombardi et al. J Vasc Surg 2020;71:723-47

# Comparing Demographics and Co-Morbid Disease

| | Acute (< 14 days) | Subacute (14-90 days) | Chronic (> 90 days) | p-value |
|---|---|---|---|---|
| **N** | 178 | 34 | 102 | |
| **Urgency** | | | | <0.001 |
| **Elective** | 26 (14.6%) | 28 (82.4%) | 82 (80.4%) | |
| **Urgent** | 51 (28.7%) | 5 (14.7%) | 13 (12.7%) | |
| **Emergent** | 100 (56.2%) | 1 (2.9%) | 7 (6.9%) | |
| **Salvage** | 1 (0.6%) | 0 | 0 | |
| **Ruptured** | 41 (23.2%) | 1 (2.9%) | 6 (5.9%) | <0.001 |
| **Malperfusion** | 84 (47.7%) | 5 (14.7%) | 3 (3.0%) | <0.001 |
| **Complicated Status** | | | | <0.001 |
| **Complicated** | 120 (67.4%) | 6 (17.6%) | 9 (8.8%) | |
| **High Risk** | 43 (24.2%) | 22 (64.7%) | 49 (48.0%) | |
| **Uncomplicated** | 3 (1.7%) | 2 (5.9%) | 7 (6.9%) | |
| **Uncomplicated, unknown risk†** | 12 (6.7%) | 4 (11.8%) | 37 (36.3%) | |
| **Readmission Prior to TEVAR*** | 3 (5%) | 8 (31%) | 6 (10%) | 0.003 |
| **Carotid subclavian bypass** | 29 (17.8%) | 18 (52.9%) | 32 (32.0%) | <0.001 |
| **Total Device Length (SD)** | 280.0 (146.8) | 336.0 (97.8) | 345.6 (136.9) | <0.001 |

†Risk unknown due to missing clinical data from the patient's index admission for type B aortic dissection
*15 out of 17 readmissions were for TBAD with high-risk features

# Intraoperative Complications

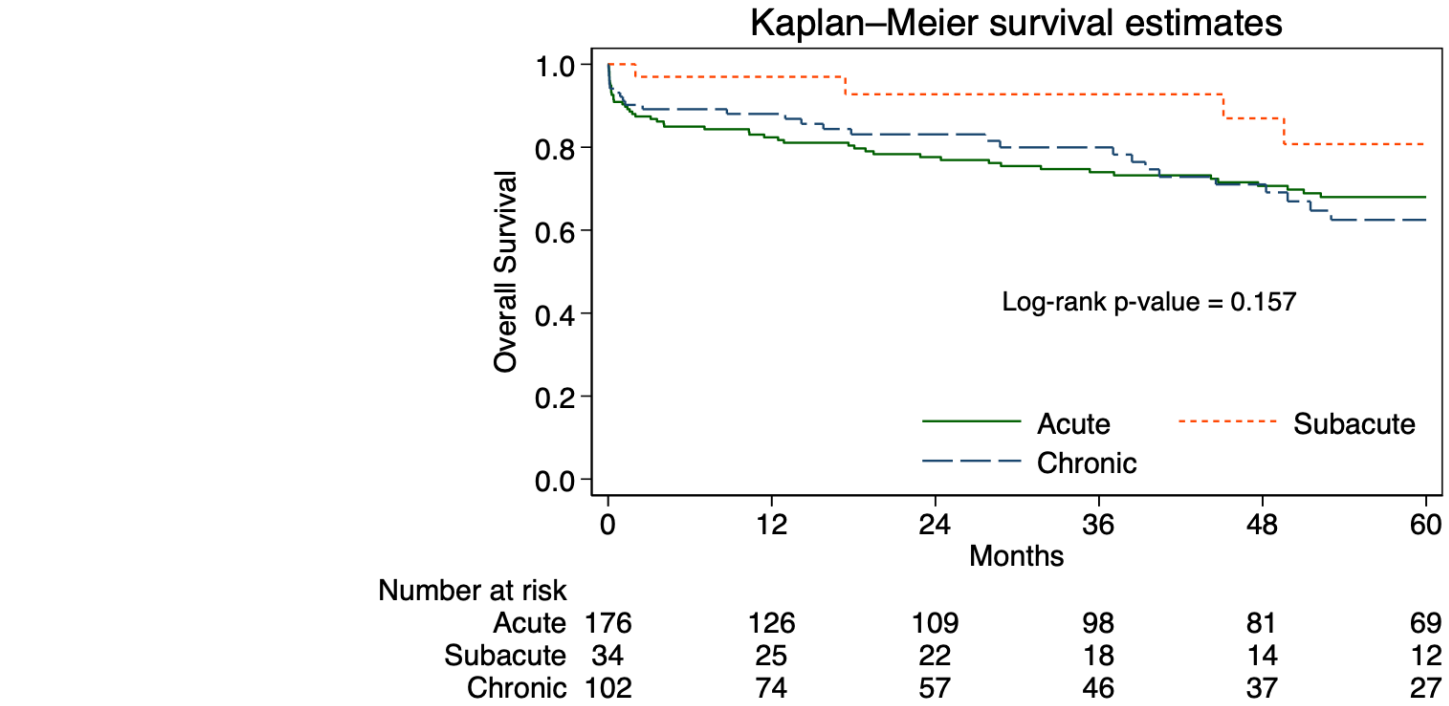
| | Acute (< 14 days) | Subacute (14-90 days) | Chronic (> 90 days) | p-value |
|---|---|---|---|---|
| | 178 | 34 | 102 | |
| **Intraoperative death** | 7 (3.9%) | 0 | 0 | 0.065 |
| **Bleeding complication** | 2 (1.1%) | 1 (2.9%) | 3 (2.9%) | 0.51 |
| **Conversion to open** | 1 (0.6%) | 0 | 0 | 0.68 |
| **Endoleak** | 10 (5.6%) | 2 (5.9%) | 4 (3.9%) | 0.80 |
| **Vascular complication** | 9 (5.1%) | 0 | 3 (2.9%) | 0.32 |
| **Any intraoperative complication** | 47 (26.4%) | 6 (17.6%) | 18 (17.6%) | 0.18 |

# Postoperative Complications

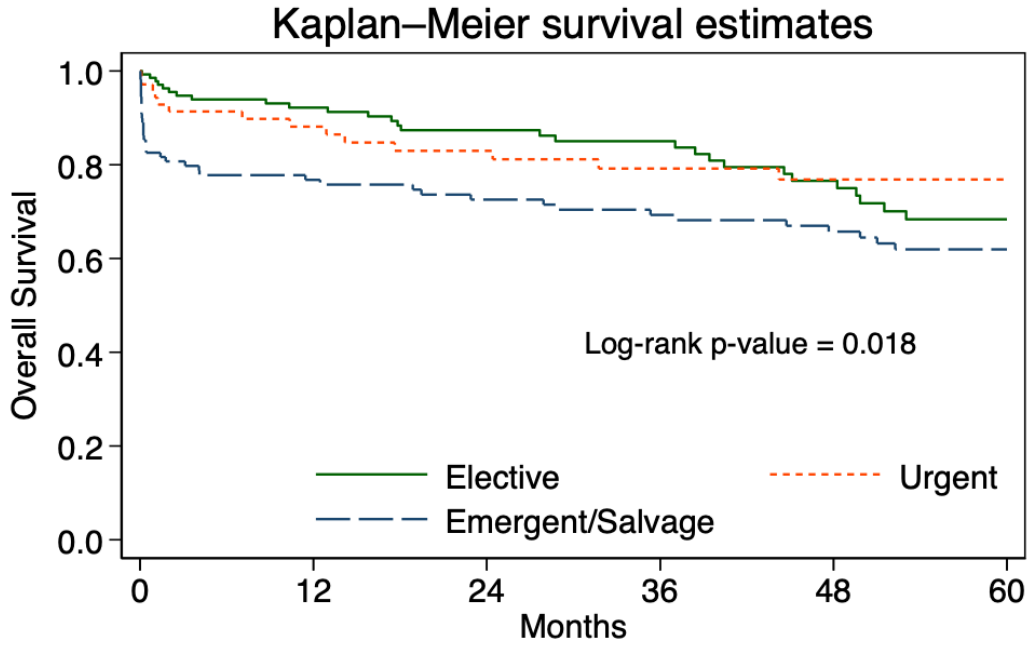
| | Acute (< 14 days) | Subacute (14-90 days) | Chronic (> 90 days) | p-value |
|---|---|---|---|---|
| | 178 | 34 | 102 | |
| **Reoperation for Bleeding** | 5 (2.8%) | 0 | 1 (1.0%) | 0.39 |
| **Retrograde Type A** | 1 (0.6%) | 0 | 0 | 0.68 |
| **Aortic Reintervention** | 2 (1.1%) | 0 | 0 | 0.46 |
| **Postoperative Stroke** | 12 (6.7%) | 2 (5.9%) | 8 (7.8%) | 0.91 |
| **Paralysis** | | | | 0.029 |
| **Transient** | 2 (1.1%) | 3 (8.8%) | 2 (2.0%) | |
| **Permanent** | 4 (2.2%) | 0 | 0 | |
| **Renal Failure** | 1 (0.6%) | 0 | 2 (2.0%) | 0.43 |
| **Gastrointestinal complications** | 19 (10.7%) | 0 | 3 (2.9%) | 0.012 |
| **Postoperative pneumonia** | 10 (5.6%) | 3 (8.8%) | 2 (2.0%) | 0.19 |
| **Postoperative Atrial fibrillation** | 22 (12.4%) | 2 (5.9%) | 7 (6.9%) | 0.24 |
| **Iliofemoral Dissection** | 1 (0.6%) | 0 | 0 | 0.68 |
| **Limb Ischemia** | 5 (2.8%) | 0 | 2 (2.0%) | 0.58 |

# Follow Up Outcomes

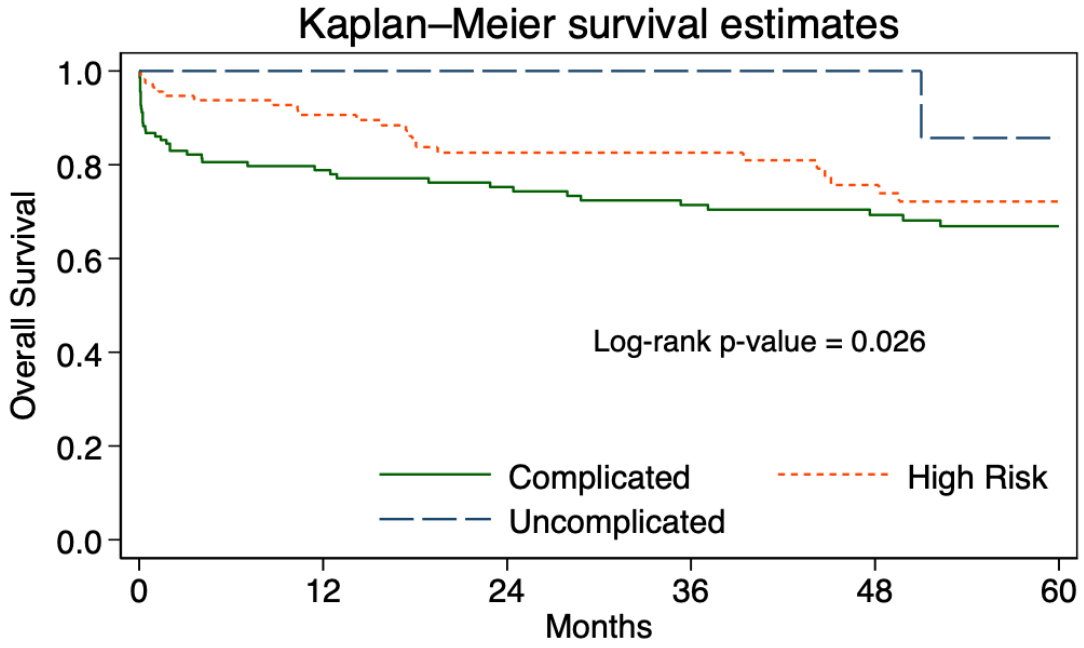
| | Acute (< 14 days) | Subacute (14-90 days) | Chronic (> 90 days) | p-value |
|---|---|---|---|---|
| | 178 | 34 | 102 | |
| **Length of stay (days), mean (SD)** | 13.0 (11.6) | 10.1 (11.1) | 7.5 (5.9) | <0.001 |
| **30-day Mortality** | 17 (9.6%) | 1 (2.9%) | 5 (4.9%) | 0.21 |
| **2-year Mortality** | 77.6% | 92.8% | 83.1% | 0.157 |
| **5-year Mortality** | 68.0% | 80.8% | 62.5% | 0.157 |



# Overall Survival by Emergent Status and Complicated Status




| Number at risk | | | | | | |
|---|---|---|---|---|---|---|
| Elective | 137 | 100 | 78 | 63 | 49 | 38 |
| Urgent | 70 | 53 | 46 | 40 | 33 | 28 |
| Emergent/Salvage | 109 | 76 | 68 | 62 | 53 | 45 |




| Number at risk | | | | | | |
|---|---|---|---|---|---|---|
| Complicated | 136 | 91 | 80 | 72 | 61 | 51 |
| High Risk | 114 | 85 | 66 | 53 | 43 | 35 |
| Uncomplicated | 12 | 10 | 8 | 8 | 8 | 6 |

# Limitations

- Many chronic TBAD patients had missing information with regards to initial presentation thus limiting ability to characterize their complicated status
- This is a retrospective review of only patients who underwent TEVAR
- This analysis lacks a comparison group of patients with uncomplicated or high-risk features

# Similar Outcomes Despite Differences in Timing and Complicated Status

- This study describes the largest single institution series of TEVAR outcomes for TBAD
- The majority of TEVARs performed in the acute window were for complicated dissection in an emergent setting
- TEVARs in the subacute setting were typically done electively for patients with initially high-risk features.
- 15 out of 17 patients who were readmitted after initial presentation had high-risk features on initial admission
- Postoperative short and long-term outcomes were comparable between acute, subacute, and chronic TEVAR timing for TBAD