



# Circulatory Arrest Times Above 30 Minutes Have Significantly Detrimental Effects on the Outcomes of Type A Aortic Dissection Repair



Andres Fernandez, MD ; Brian Raffel, MD ; Julie Wise, MD ; Mark Russo, MD ; Leonard Lee, MD ; Anthony Lemaire, MD Antonio Chiricolo, MD

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## Introduction

- Acute ascending aortic dissection is a life-threatening condition requiring emergent surgical repair.
- Hypothermic circulatory arrest (HCA) is commonly used during proximal aortic repair.

## Objectives

- To identify the critical circulatory arrest time threshold that increases the risk of postoperative complications in Type A aortic dissection repair.

Table 1 Baseline Characteristics

| Variable                 | Overall (n=51) | CA >30 min (n=12) | CA ≤30 min (n=39) | p-value |
|--------------------------|----------------|-------------------|-------------------|---------|
| Age (years)              | 54             | 69                | 63                | .302    |
| Male gender, n (%)       | 33 (65%)       | 8 (67%)           | 25 (64%)          | .87     |
| Hypertension, n (%)      | 35 (69%)       | 9 (75%)           | 26 (67%)          | .58     |
| Diabetes mellitus, n (%) | 22 (43%)       | 2 (17%)           | 20 (51%)          | .034    |
| Previous CVA, n (%)      | 4 (8%)         | 1 (8%)            | 3 (8%)            | .942    |
| History of CHF, n (%)    | 5 (10%)        | 3 (25%)           | 2 (5%)            | .043    |

## Methods

- Retrospective review of 51 patients who underwent Type A aortic dissection repair between 2016 and 2019.
- Patients were divided into two groups based on circulatory arrest time:
  - Time >30 minutes** (n=12)
  - Time ≤30 minutes** (n=39)
- Primary outcomes: 30-day mortality, length of hospital stay, readmission rate.
- Secondary outcomes: postoperative complications including cerebrovascular accident (CVA) and atrial fibrillation.
- Statistical analysis: Chi-square, Fisher's Exact Test, and pooled T-tests (significance level p<0.05).

## Results

- No significant differences in baseline characteristics between groups.
- Significant differences observed in:
    - Cardiopulmonary bypass time (p = .035)
    - Cross-clamp time (p = .037)
  - Increased complications in the >30 min group:
    - Cerebrovascular accident: 33% vs. 6% (p = .027)
    - Postoperative atrial fibrillation: 50% vs. 18% (p = .029)

## Conclusions

- Circulatory arrest times exceeding 30 minutes are associated with significantly higher rates of cerebrovascular accidents and postoperative atrial fibrillation.
- These findings suggest the need for stricter intraoperative time management protocols.
  - Further research is recommended to evaluate long-term outcomes in patients undergoing Type A aortic dissection repair.

Table 2 Outcomes and Complications

| Variable                                 | Overall (n=51)    | CA >30 min (n=12) | CA ≤30 min (n=39) | p-value |
|------------------------------------------|-------------------|-------------------|-------------------|---------|
| 30-day mortality, n (%)                  | 14 (28%)          | 5 (42%)           | 9 (23%)           | .207    |
| CPB time (minutes)                       | 165.5 (125.5–243) | 218               | 148               | .035    |
| Cross-clamp time (minutes)               | 92 (70–164)       | 160               | 87                | .037    |
| CVA, n (%)                               | 7 (14%)           | 4 (33%)           | 3 (6%)            | .027    |
| Postoperative atrial fibrillation, n (%) | 13 (26%)          | 6 (50%)           | 7 (18%)           | .029    |

## References

1. Okita Y, et al. “Deep hypothermic circulatory arrest for aortic arch surgery: safe time limit.” Ann Thorac Surg. 2002;74:S1821–S1825.
2. Griepp RB, et al. “The physiology of hypothermic circulatory arrest.” J Thorac Cardiovasc Surg. 1975;70:949–956.