Choice of Arch Branch Vessel Cannulation in Acute Type A Aortic Dissection Surgery

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Purpose

- Mortality in untreated acute Type A aortic dissection (ATAAD) is 1-2% per hour for the first 24-48 hours
- Safe and expeditious cannulation for cardiopulmonary bypass (CPB) is needed in most cases
- The innominate artery is the most commonly cannulated vessel for cerebral perfusion
- We compare outcomes of axillary artery vs innominate artery cannulation for CPB during repair of ATAAD

Methods

- Retrospective analyses of ATAAD cases at our institution from January 2016 to January 2022 were performed

- Patients were divided into two groups:
  - Axillary artery cannulation (N=65, 61%)
  - Innominate artery cannulation (N=41, 39%)

- Baseline characteristics, operative metrics, and post-surgical outcomes were compared between groups

Patient Demographics

No differences in demographic characteristics in patients undergoing axillary versus innominate artery cannulation

	Axillary (N=65)	Innominate (N=41)	P value
Age (years)	54 (46-67)	57 (50-66)	0.72
Gender (Male)	65%	71%	0.5
Race (African American)	26%	29%	0.72
BMI (kg/m^2)	29 (25-34)	30 (25-33)	0.91
BSA (m^2)	2.0 (1.9-2.2)	2.0 (1.9-2.3)	0.82

Preexisting Conditions

No differences in preexisting conditions between patients undergoing axillary versus innominate artery cannulation

	Axillary (N=65)	Innominate (N=41)	P value
Hypertension	88%	88%	0.97
Diabetes Mellitus	6%	10%	0.47
Chronic Lung Disease			
No	65%	65%	0.89
Mild	5%	5%	
Moderate	3%	3%	
Severe	2%	5%	
Unknown Severity	15%	10%	
Prior Cerebrovascular disease	14%	15%	0.78

Cardiac and Renal Function

No differences in pre-operative cardiac or renal function between patients undergoing axillary versus innominate artery cannulation

	Axillary (N=65)	Innominate (N=41)	P value
Hemoglobin	13.2 (11.8-14.3)	12.9 (11.6-14.8)	0.81
Creatinine	1.1 (0.8-1.5)	1.1 (0.9-1.5)	0.54
Bilirubin	0.8 (0.6-1.1)	0.7 (0.5-0.8)	0.06
Pre-operative Dialysis	3%	5%	0.61
Aortic Regurgitation			
None	18%	17%	0.65
Mild	15%	9%	
Moderate	21%	26%	
Severe	21%	35%	
Unreported (before surgery)	25%	13%	
LVEF (%)	52 (41-60)	60 (58-63)	0.06

Procedure

No differences in the operative procedures being performed between patients undergoing axillary versus innominate artery cannulation

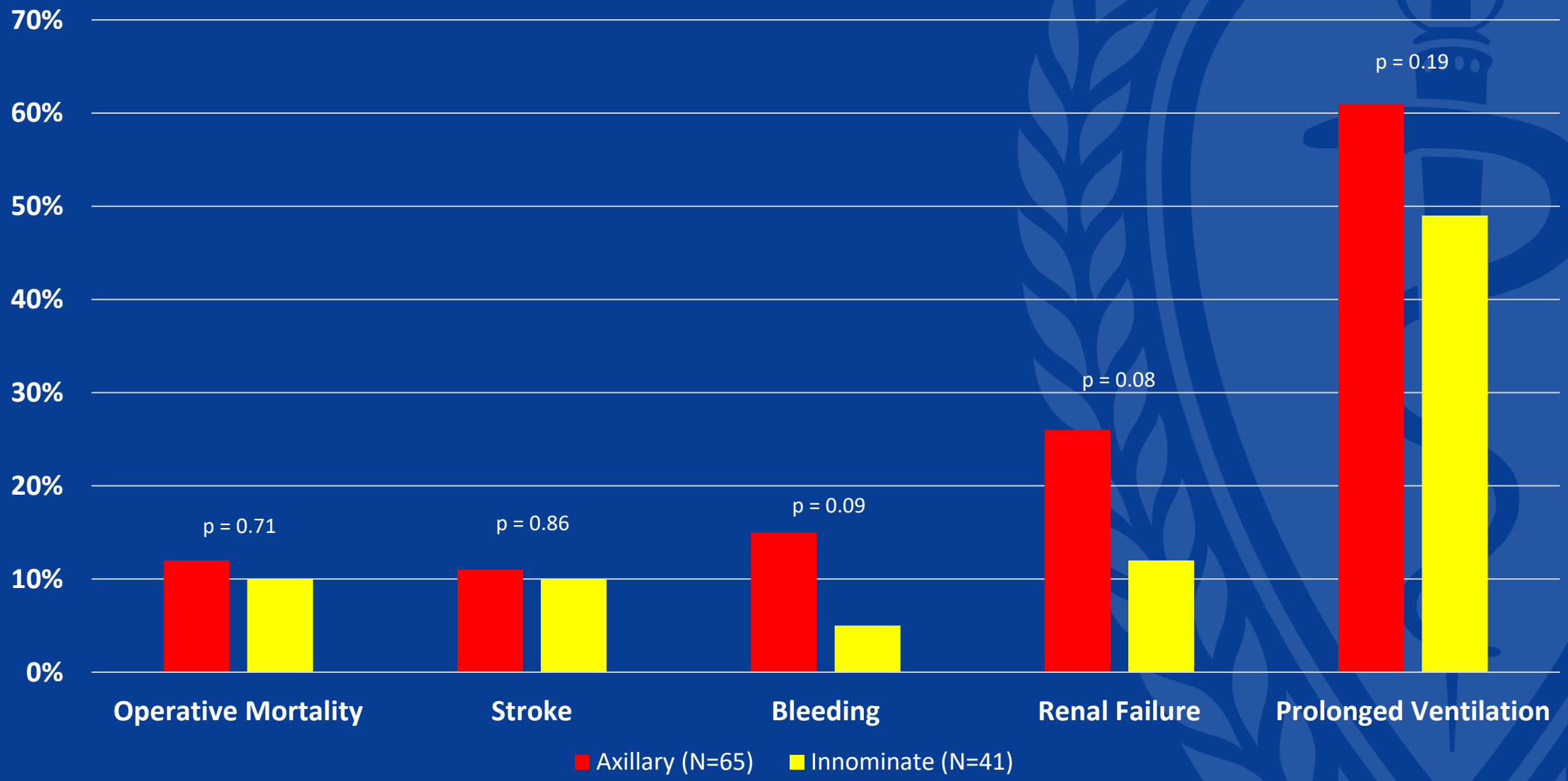
	Axillary (N=65)	Innominate (N=41)	P value
Reoperation	8%	3%	0.48
Root Replacement	28%	27%	0.65
Valve Re-suspension	51%	46%	
Hemi Arch reconstruction	86%	90%	0.53
Total Arch reconstruction	5%	0%	0.24

Operative Metrics

No differences in studied metrics between patients undergoing axillary versus innominate artery cannulation

	Axillary (N=65)	Innominate (N=41)	P value
CPB time (minutes)	213 (189-264)	198 (165-236)	0.08
Cross clamp time (minutes)	123 (93-148)	105 (87-142)	0.2
Circulatory arrest	89%	92%	0.55
Cerebral Perfusion Retrograde	0%	8%	0.08
Cerebral Perfusion Antegrade	95%	84%	
Cerebral Perfusion Both	5%	8%	
Cerebral Perfusion time	34 (26-41)	31 (27-38)	0.61
Lowest Body Temp	22 (18-25)	23 (21-25)	0.89

Post-Surgical Outcomes



Conclusions

- Axillary and innominate artery cannulation for ATAAD surgery are safe and effective options for initiating CPB
- There were no differences observed in operative metrics, including CPB time and cross-clamp time
- Post-surgical outcomes were not statistically different between those who underwent axillary artery cannulation vs innominate artery cannulation