

Midterm Outcomes of Minimally Invasive Concomitant Hemiarch

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Introduction

- Hemiarch repair of aortic pathology has traditionally been performed via full sternotomy
- Advancements in minimally invasive cardiac surgery have provided the opportunity to perform such surgeries through a ministernotomy
- We present our surgical technique and midterm outcomes

Methods and Surgical Technique

- Retrospective analysis of a prospectively maintained database to find patients who underwent hemiarch repair by a single surgeon
- From 2015 to 2019, 11 patients (70.1 ± 13.1 years) underwent concomitant hemiarch repair
- Upper hemisternotomy performed at the 4th intercostal space (Figure 1)
- Cannulation performed via the aortic arch and right femoral vein (Figure 2)
- After aortic cross clamp and cardioplegic arrest, the proximal procedures are performed
- Next, deep hypothermic circulatory arrest is initiated, and a graft is beveled and anastomosed to the under-side of the aortic arch
- At completion of the anastomosis RCP is used to de-air the aortic arch, the graft is then canulated and antegrade perfusion is used for cerebral protection

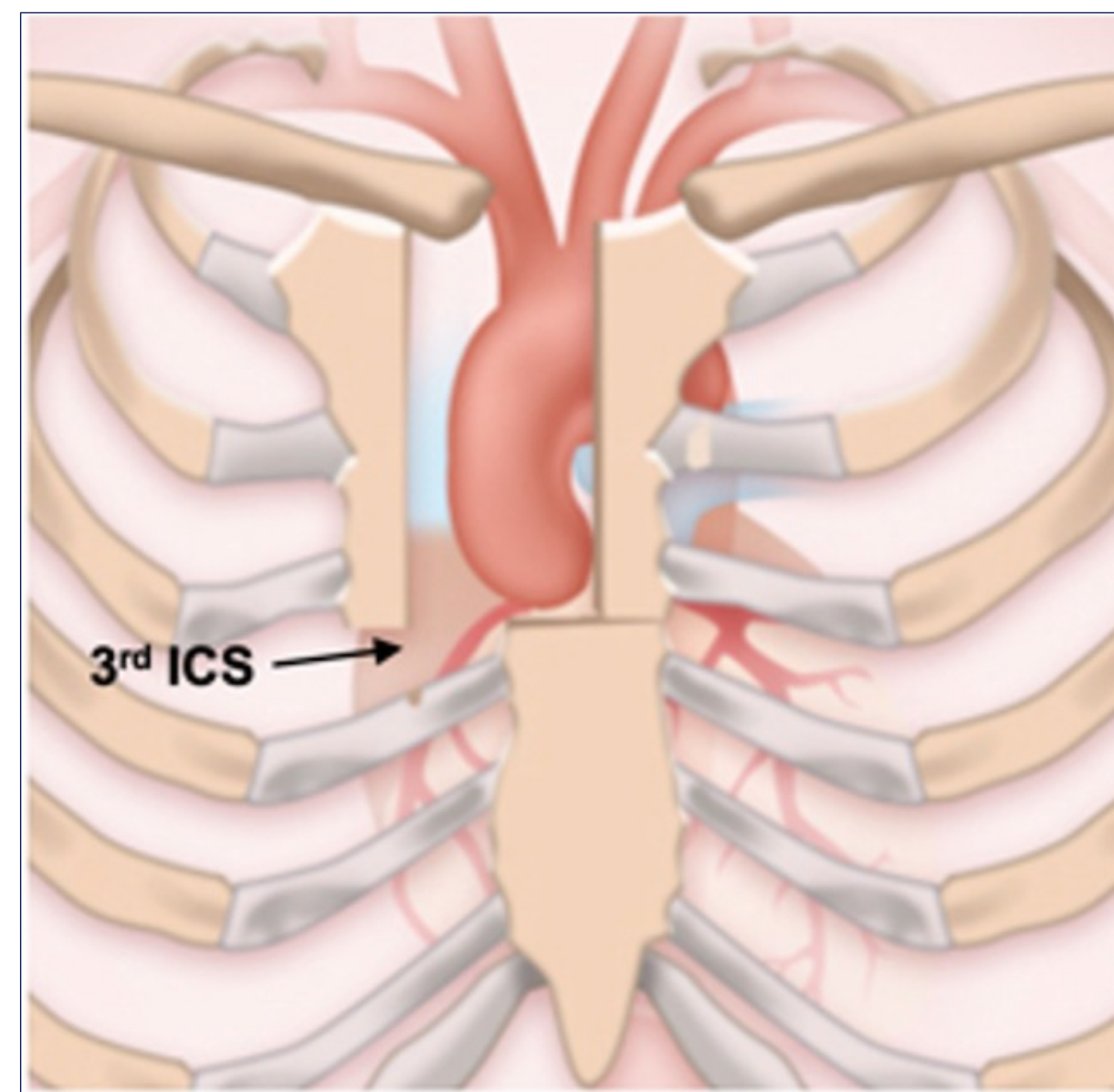


Figure 1. A schematic representation of Upper J-type ministernotomy.

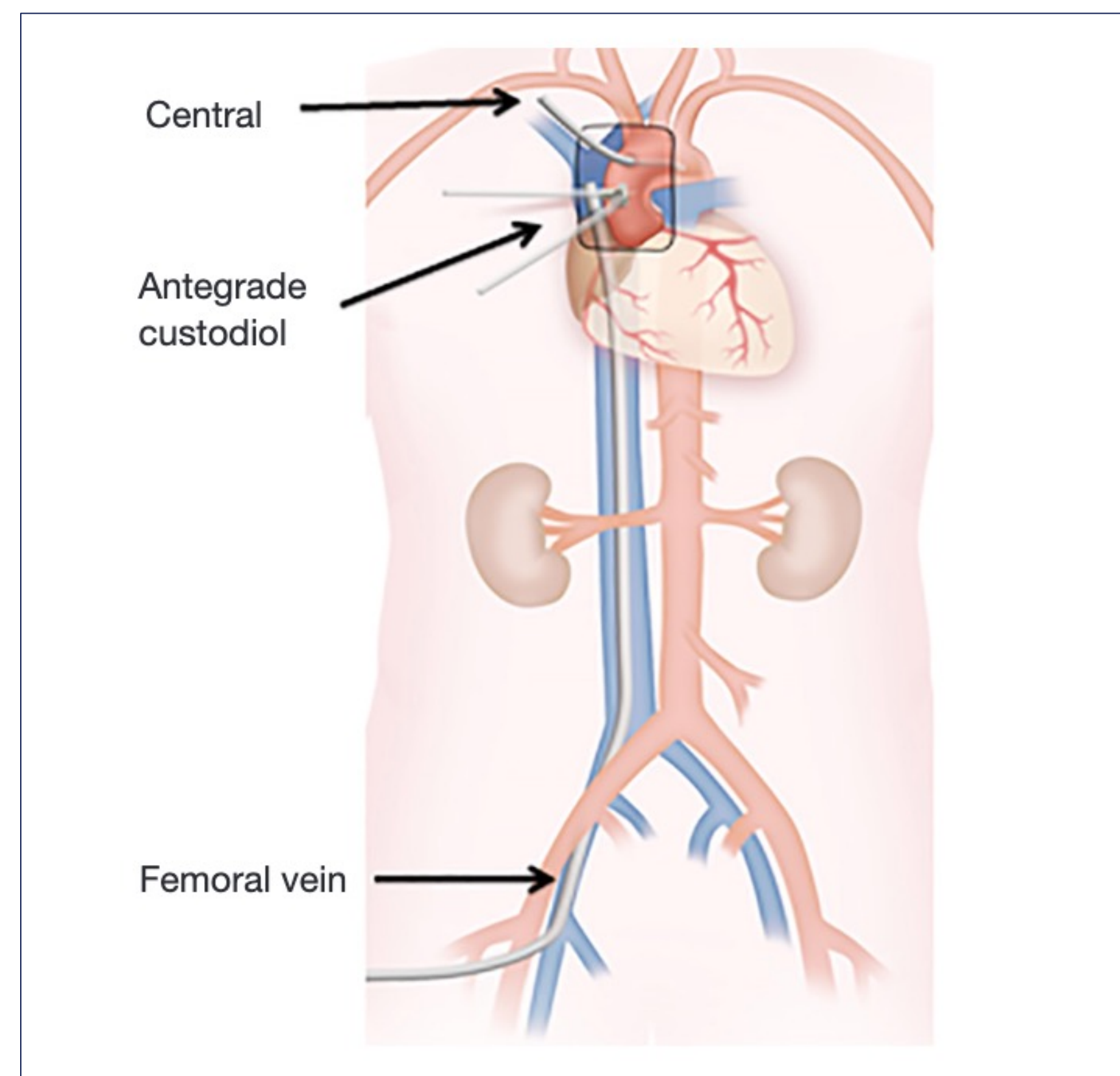


Figure 2. Cannulation and Cardioplegia strategy

Table 1. Patient Demographics and Preoperative Comorbidities (n=11)

Average Age (years)	70.0 ± 13.1
Male %	4 (36.3%)
CHF	2 (18.2%)
Average LVEF (%)	61.0 ± 9
Diabetes	2 (18.2%)
Hypertension	8 (72.7%)
Hypercholesterolemia	8 (72.7%)
COPD	2 (18.2%)
Preoperative TIA	0
Preoperative Stroke	0
Renal Insufficiency	0

Table 2. Operative Data (n=11)

Aortic Insufficiency	
None	4 (36.7%)
Mild	2 (18.2%)
Moderate to Severe	5 (45.5%)
Simultaneous Procedure	
Aortic Root Replacement + Ascending + Hemiarch	3 (27.3%)
Ascending + Hemiarch	8 (72.7%)
Circulatory Arrest Time (min)	15.0 ± 15.1
CPB Time (min)	195.0 ± 42.9
Cross Clamp Time (min)	119.1 ± 58.1
ACP	4 (36.7%)
RCP	7 (63.6%)

Table 3. Post-Operative Data (n=11)

Average length of ICU stay (days)	8.1 ± 14.1
Average length of hospital stay (days)	13.0 ± 16.5
Stroke	0
TIA	0
Atrial Fibrillation	5 (45.5%)
Re-intubation	0
Prolonged ventilatory support (>48 hours)	2 (18.2%)
Vocal cord paralysis	0
Re-op for bleeding	0
Post-operative in hospital death	0
Average follow-up duration (days)	5.41 ± 1.58

Table 4. Follow Up and Outcomes (n=11)

Average follow-up duration (days)	5.41 ± 1.58
1-Year Survival	100%
5-Year Survival	70.1%

Conclusions

- Upper ministernotomy can be used safely for the replacement of the ascending aorta and aortic arch using the hemiarch technique
- Our study demonstrated excellent outcomes at 1 year and acceptable outcomes at 5 years
- Further studies comparing hemisternotomy against full sternotomy and long term follow up is needed