

Should we prophylactically replace non aneurysmal aortic arch during elective valve sparing aortic root replacement in Marfan patients

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**The Houston Aortic Symposium 2026**

March 5-7, 2026

The Westin Oaks, Houston, Texas



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# Disclosure

- 1. Consultant to Terumo Aortic & Edwards Lifesciences
- 2. No disclosures regarding this Presentation

# Background

- Aortic root replacement (Bentall Procedure / David Procedure) is routinely performed in Marfan patients with aortic root dilatation.

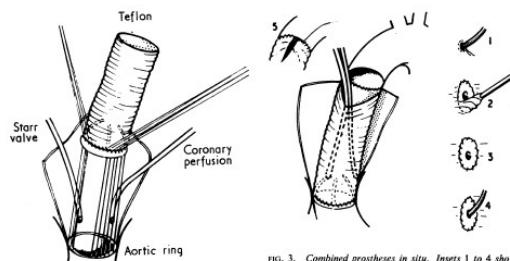


FIG. 2. Starr valve has been sutured to aortic prosthesis: sutures have been placed in aortic ring before fixing the combined prostheses.

The technique used is reported as it offers an alternative method of dealing with this type of aortic disease when the whole of the ascending aorta has to be replaced.

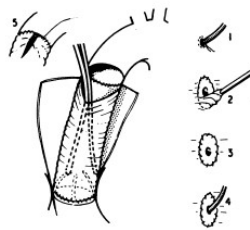
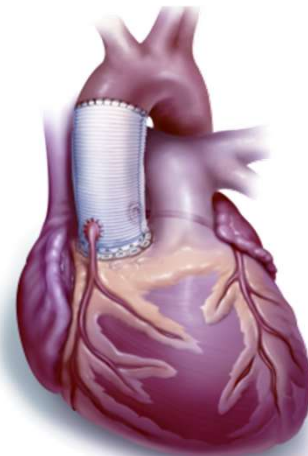


FIG. 3. Combined prostheses in situ. Insets 1 to 4 show details of holes fashioned in the side wall of the Teflon tube to reincorporate the coronary ostia within the lumen of the new ascending aorta. Inset 5 shows the vertical slit in the prosthesis.

#### REFERENCE

Cooler, D. A., Bloodwell, R. D., Ball, A. C., Hellman, G. L., and De Bakey, M. E. (1966). Surgical management of aneurysms of the ascending aorta. *Surg. Clin. N. Amer.*, 46, 1031.



- There is no consensus on whether the normal sized aortic arch should be prophylactically replaced in these patients during elective aortic root replacement.



# Revisiting ascending aortic resection in the elective valve-sparing root replacement: assessing the benefits and necessity of hemiarch replacement at three centres<sup>†</sup>

JOURNAL ARTICLE

European Journal of Cardio-Thoracic Surgery, Volume 67, Issue 2, February 2025, eza006, <https://doi.org/10.1093/ejcts/eza006>

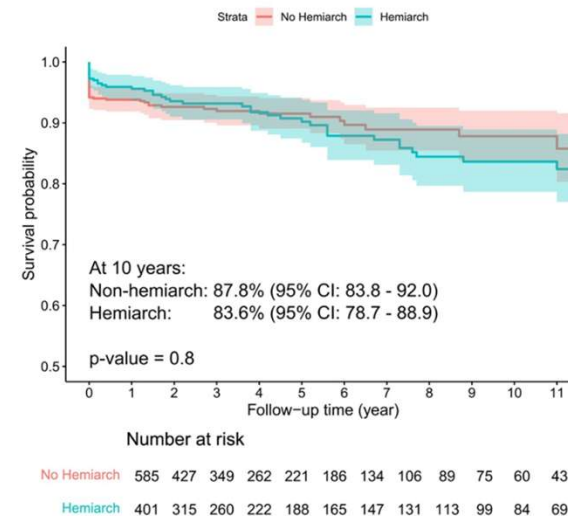
Murat Yildiz , Florian Schoenhoff, Victoria Werdecker, Maria Nucera, Selim Mosbahi, Yu Zhao, Nicholas Goel, Mikolaj Berezowski, Kendall Lawrence, Sankrit Kapoor, Maximillian Kreibich, Tim Berger, Joseph Kletzer, Joseph Bavaria, Wilson Y Szeto, Matthias Siepe, Martin Czerny, Nimesh D Desai

## Revisiting ascending aortic resection in the elective valve-sparing root replacement

### Summary

Among 986 patients undergoing valve-sparing root replacement at three tertiary care centers, hemiarch replacement did not increase perioperative risk but showed no mid-term protection against aortic reintervention. The primary outcome was a composite of mortality, aortic reintervention, dissection, and cerebrovascular accident within 30 days.

Freedom from composite endpoint before matching





# Contemporary results of open aortic arch surgery

Mathew Thomas, MBBS,<sup>a</sup> Zhuo Li, MS,<sup>a</sup> David J. Cook, MD,<sup>d</sup> Kevin L. Greason, MD,<sup>a</sup> and Thoralf M. Sundt, MD<sup>c</sup>

The Journal of Thoracic and Cardiovascular Surgery • October 2012

## Methods

The outcomes of open arch procedures performed on Consecutive patients who underwent reconstruction of the aortic arch by 1 surgeon (T.M.S.) at the Mayo Clinic, Rochester, Minnesota, from July 1, 2001, to August 30, 2010,

## Results

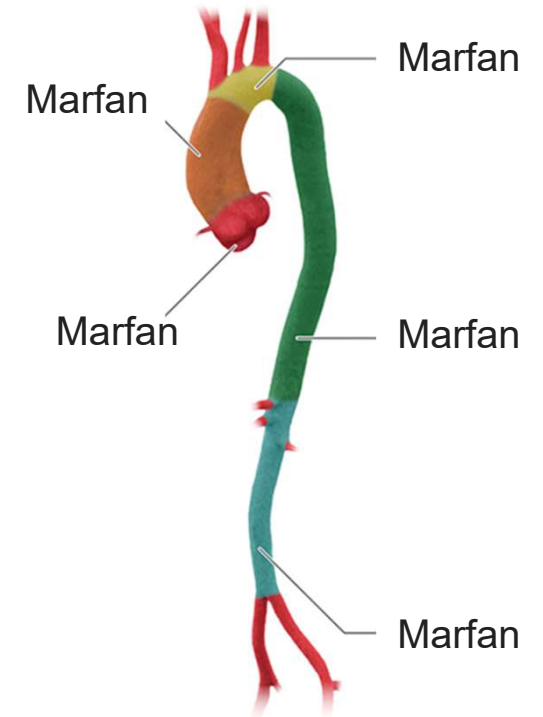
During the study period, 209 patients (median age, 65 years; range, 26-88) underwent arch operations, of which 159 were elective procedures. In 65 the entire arch was replaced (144 Hemiarch).

- **Procedure-specific mortality rates were 1.0% for elective** and 10% for emergency procedures with hemiarch replacement.
- Stratified by extent, **neurologic event rates were 4.8% for elective** and 12.5% for emergency procedures with hemi-arch replacement.



**VS**





*"The whole aorta has Marfan genes: with that argument then one has to replace the whole aorta, root to bifurcation!"*

*But: we need proof!*

# Should We Replace the Non-Aneurysmal Aortic Arch During Elective Valve-Sparing Aortic Root Replacement in Marfan Patients?

JOURNAL ARTICLE

European Journal of Cardio-Thoracic Surgery, Volume 68, Issue 1, January 2026, ezaf417, <https://doi.org/10.1093/ejcts/ezaf417>

Malakh Shrestha ✉, Tim Kaufeld, Linda Rudolph, Heike Krueger, Mizala Shrestha, Andreas Martens, Erik Beckmann

Should we replace the non-aneurysmal aortic arch during elective valve-sparing aortic root replacement in Marfan patients?

## Summary

67 patients underwent elective valve-sparing aortic root replacement for aortic root aneurysm. In-hospital mortality and stroke rates were both 0%. Freedom from all-cause aortic arch intervention at 1, 5, 10, and 20 years was 100, 100, 93, and 85%. No patient developed degenerative aortic arch aneurysm. A total of 3 patients required arch repair related to chronic type B aortic dissection. This study suggests that prophylactic arch repair during root surgery is not indicated in Marfan patients.

## Freedom from aortic arch reintervention

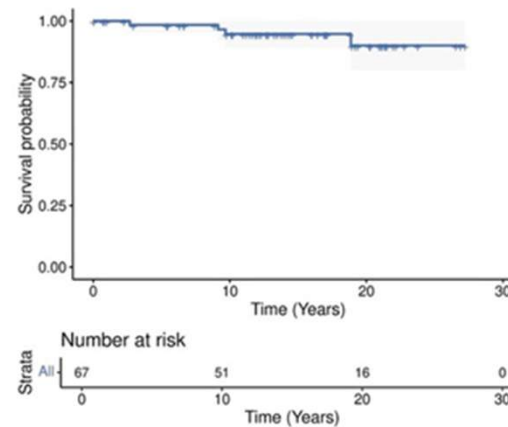


Fig: Freedom from all-cause arch reintervention after valve-sparing root replacement in Marfan patients



Hannover Medical School

## Methods

- Between 1993 and 2021, a total of 723 patients underwent VSARR with a straight tube graft (David I Re-implantation).
- 119 patients had confirmed Marfan disease.
- Of these 119 Marfan patients, 67 patients had isolated aortic root aneurysm with no aortic arch Pathology.
- These patients underwent isolated David I procedure in an elective setting (Only aortic root and ascending aortic replacement).
- Follow-up was 100% complete.



## Patients      Isolated elective David I procedure in Marfan patients

Preoperative Data	n=67
Sex (Male), n (%)	47 (70.1)
Age (Years), median (IQR)	30.0 (20.0 – 41.0)
Previous cardiac surgery (re-do), n (%)	1 (1.5)
BMI (kg/m <sup>2</sup> ), median (IQR)	21.9 (18.9 – 25.4)
Arterial hypertension, n (%)	21 (31.3)

Intraoperative Data	n=67
Operative time (minutes) , median (IQR)	240.0 (220.0 – 265.0)
CPB time (minutes) , median (IQR)	157.5 (145.8 – 178.3)
Minimally invasive access, n (%)	7 (10.4)

Echocardiographic data			
Characteristics	Pre-op n=66	Post-op n=63 (available)	Follow-up n=57
AI 0°, n (%)	12 (18.2)	31 (49.2)	28 (49.1)
AI 0 - I°, n (%)	4 (6.1)	14 (22.2)	17 (29.8)
AI I°, n (%)	20 (30.3)	16 (25.4)	9 (15.8)
AI I - II°, n (%)	3 (4.5)	1 (1.6)	3 (5.3)
AI II°, n (%)	11 (16.7)	1 (1.6)	-
AI II - III°, n (%)	4 (6.1)	-	-
AI ≥ III°, n (%)	12 (18.2)	-	-

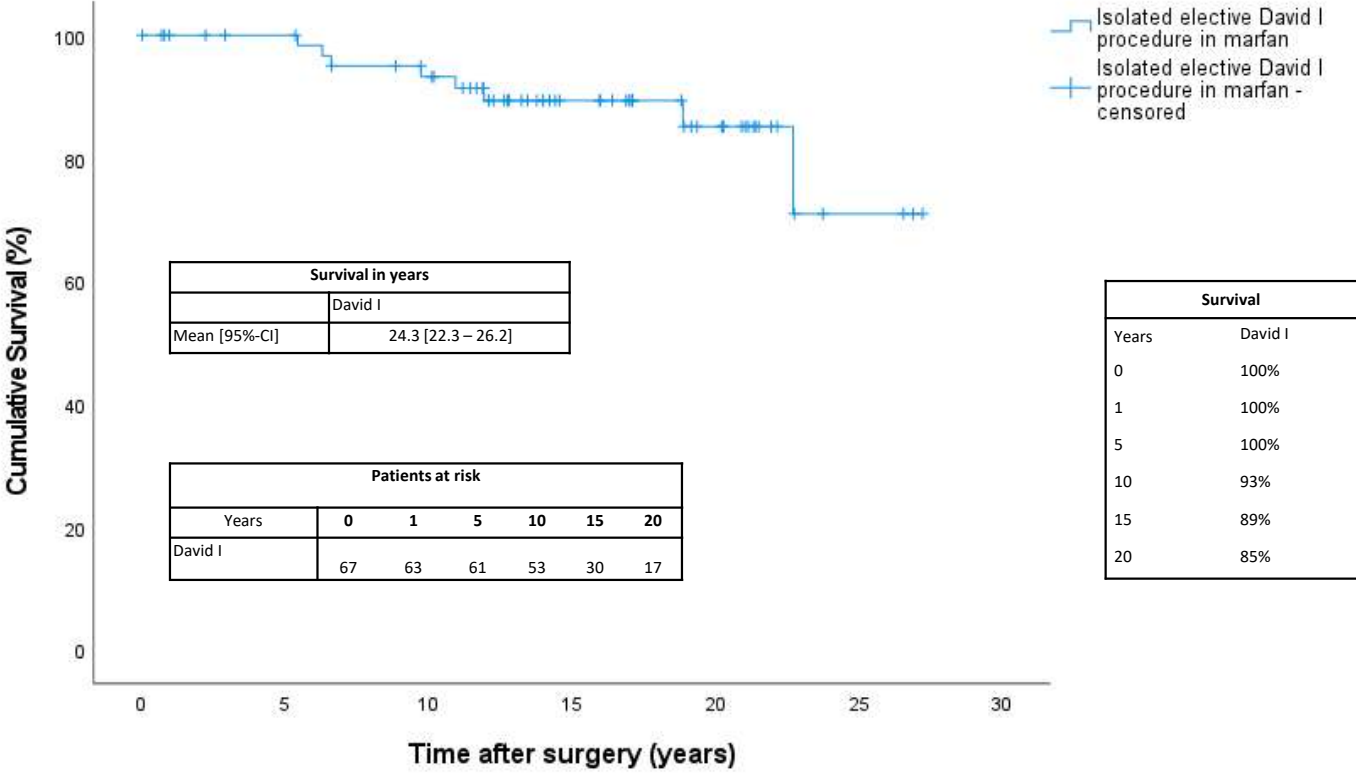


## Follow-up

- Mean Follow-up time was 16 years & comprised 1077 patient years.
- The status of the aortic arch was specifically looked into.
- None of the Pts. developed a degenerative aortic arch aneurysm
- 3 patients (4.5%) developed complicated Type B aortic dissection and underwent aortic arch replacement

Results 1

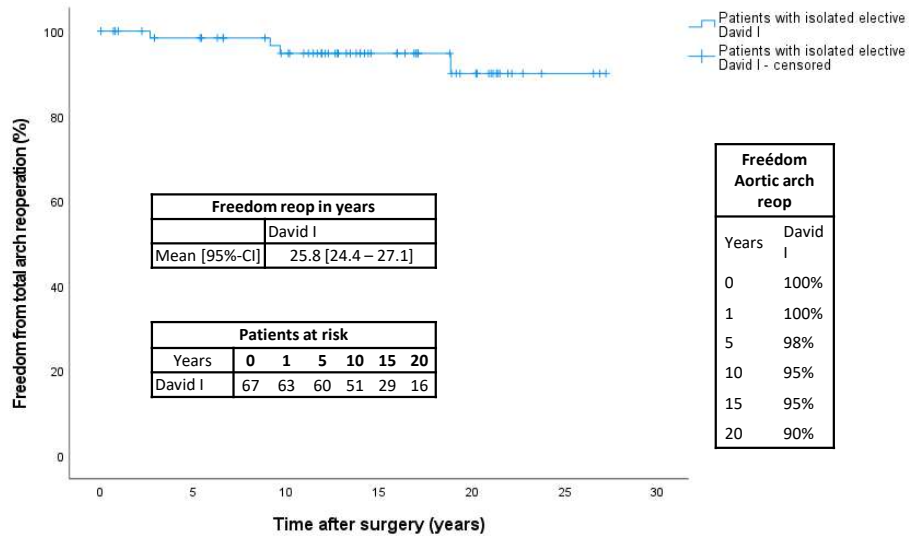
# Kaplan Meier Survival Curves



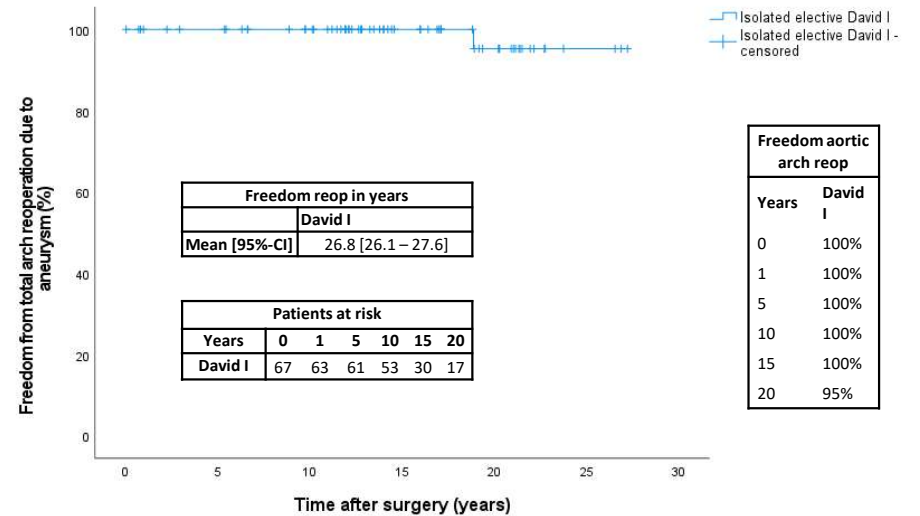
## Results 2

# Kaplan Meier Freedom from aortic arch re-operation Curves

Freedom from all cause total arch reoperation\*



Freedom from aortic arch reoperation due to aneurysm



\*Three patients underwent aortic arch replacement due to Type B aortic dissection.

# Neuropsychological performance of school-aged children after staged surgical palliation of hypoplastic left heart syndrome

ORIGINAL ARTICLE

Annabell Bergemann<sup>a</sup>, Jan Hinnerk Hansen<sup>a\*</sup>, Ina Rotermann<sup>a</sup>, Inga Voges<sup>a</sup>, Jens Scheewe<sup>b</sup>,  
Christine Otto-Morris<sup>c</sup>, Friedemann Geiger<sup>d</sup> and Hans-Heiner Kramer<sup>e</sup>

European Journal of Cardio-Thoracic Surgery 47 (2015) 803-811

## Objectives:

This study aimed to assess a neuropsychological profile of hypoplastic left heart syndrome (HLHS) patients at school age who underwent the Norwood operation between 1996 and 2003 with deep hypothermic circulatory arrest (DHCA) or antegrade selective cerebral perfusion (ASCP), respectively.

**Methods:** Forty HLHS patients (DHCA: n = 11 and ASCP: n = 29) were compared with healthy controls (DHCA controls: n = 10 and ASCP controls: n = 24), recruited according to age, sex and socioeconomic status.

**Results:** Compared with control subjects, both patient groups had average non-verbal intelligence scores [DHCA: 102 (72-112) and ASCP: 92 (70-127)], but showed reduced long-term memory capacities and decreased executive performance as well as reduced processing speed. DHCA patients, furthermore, had a reduced visual attention span, and ASCP patients scored less on the verbal learning task than controls.

**Conclusions:** School-age children with HLHS who underwent the Norwood procedure either with DHCA or ASCP show cognitive impairments compared with healthy controls.

## Conclusion

- The long-term results (freedom from valve re-operation and survival) after valve sparing aortic root replacement with a straight tube graft (David I Procedure) are excellent.
- In our experience, **no patients** needed aortic arch replacement in follow up due to aortic arch aneurysm.
- In follow-up, a total of only three patients came back for aortic arch replacement (due to Type B aortic dissection).
- Our experience suggests that prophylactic normal sized aortic arch replacement during elective valve sparing aortic root replacement in Marfan patients is NOT NECESSARY!

- **Adhere to Guidelines: Indication for concomitant hemi-arch replacement is 4.5 cm.**



