

What Does Endovascular Aortic Repair Do To Cardiac And Coronary Artery Function: Does The Position Of The Graft In The Aorta Make A Difference: Do We Need A Compliant Endograft?

Rachel Clough, PhD FRCS

Consultant Vascular Surgeon
 Director NIHR Cardiovascular HealthTech Research Centre
 King's College London

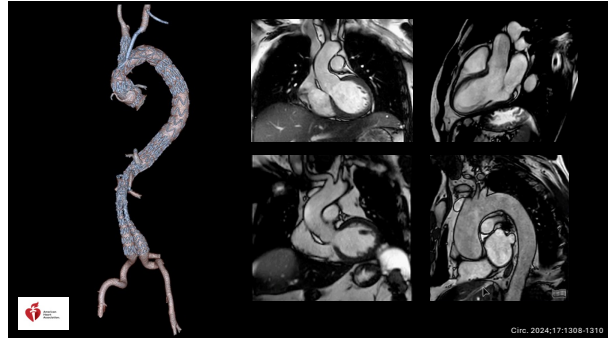


Disclosures

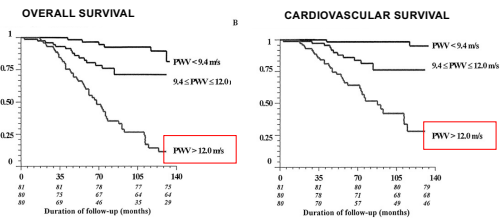
Speaker name: Rachel Clough

I have the following potential conflicts of interest to report:

- ✓ Consultant: Cydar Medical
- ✓ Consultant: GE Healthcare
- ✓ Consultant: Medtronic Digital Surgery

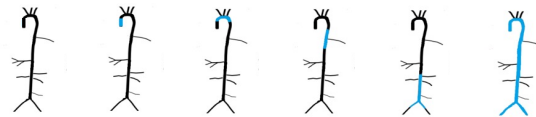


Vascular stiffening

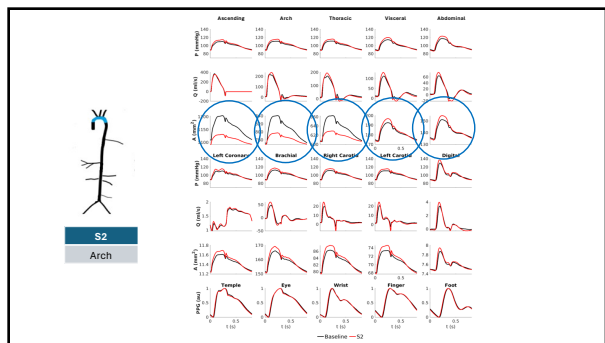
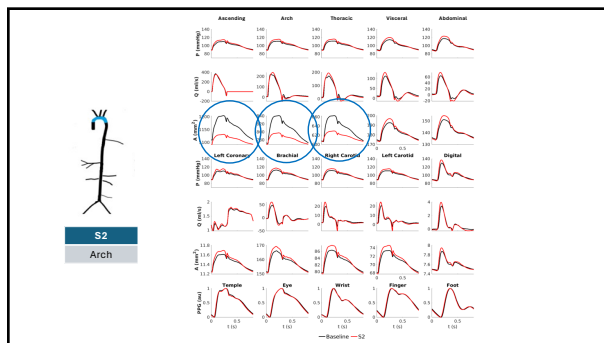
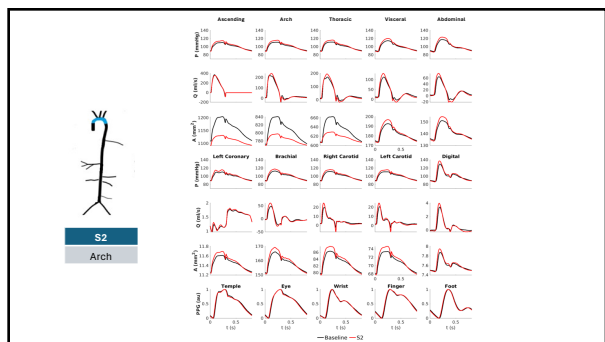
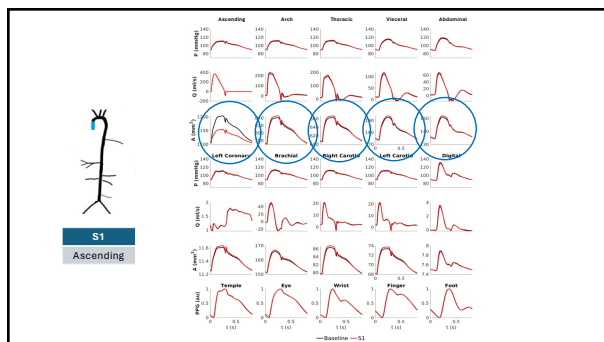
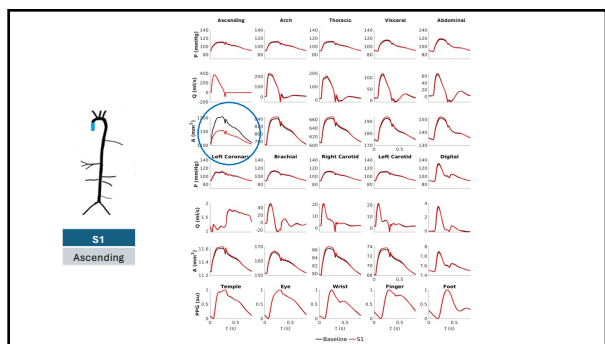
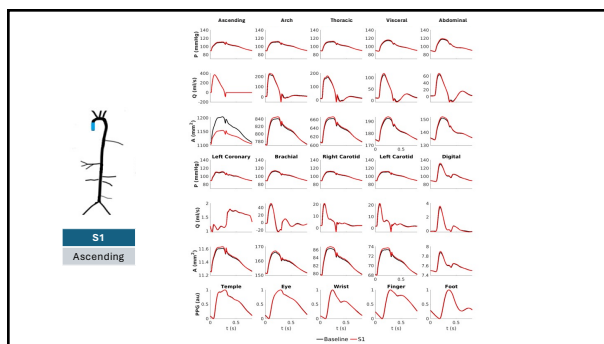


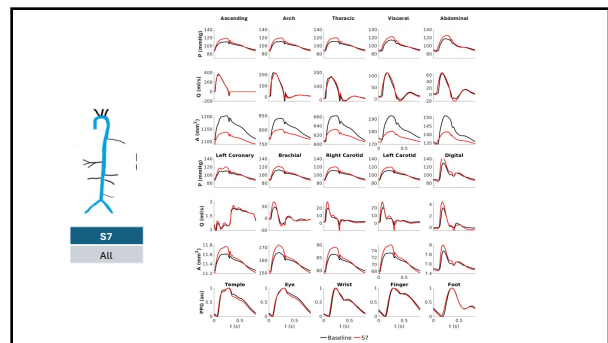
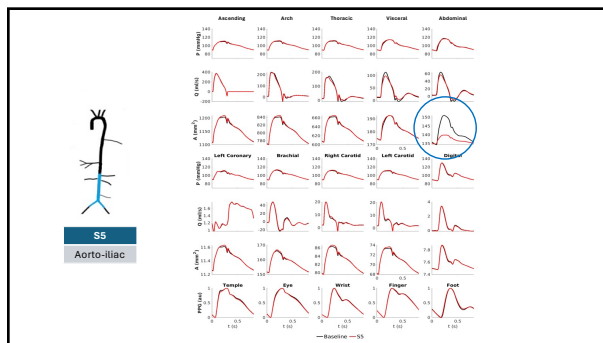
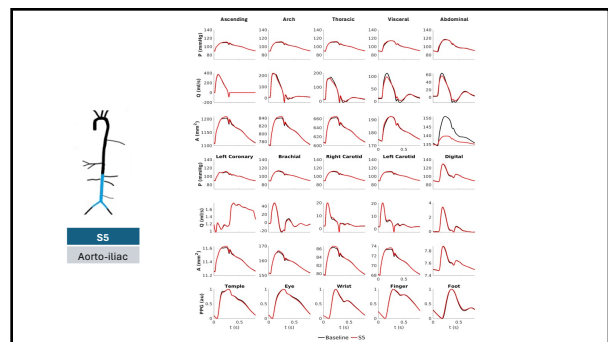
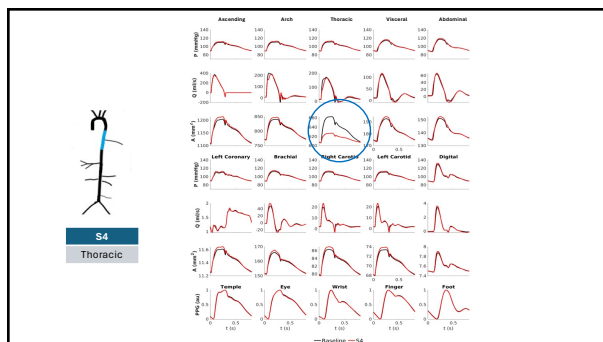
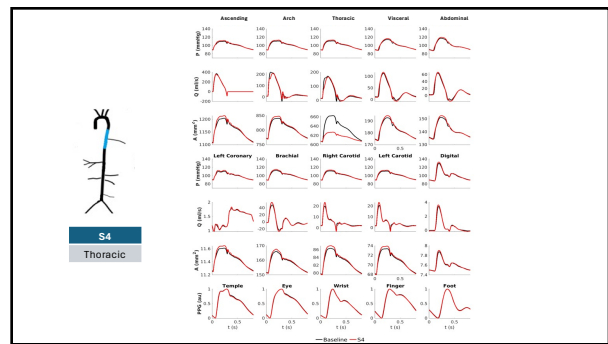
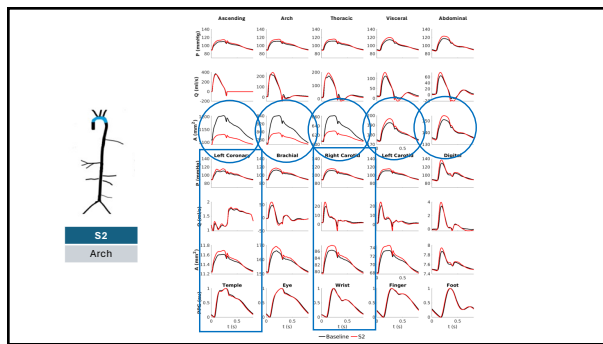
Probabilities of overall survival (A) and event-free survival (cardiovascular mortality, B) in study population according to level of PWV divided into tertiles. Circ. 1999;99:2434-2439

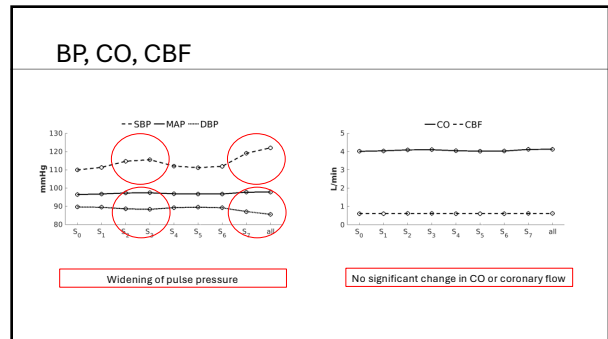
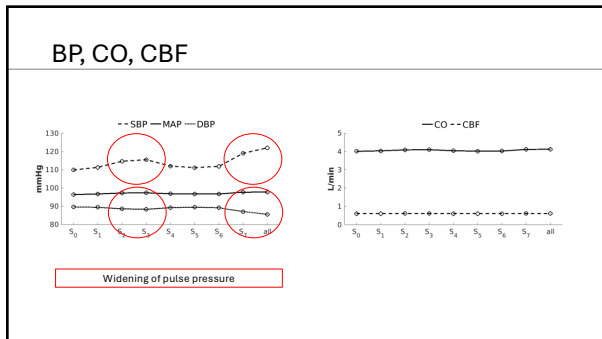
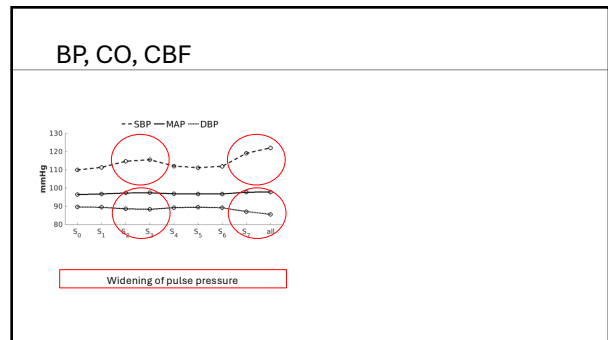
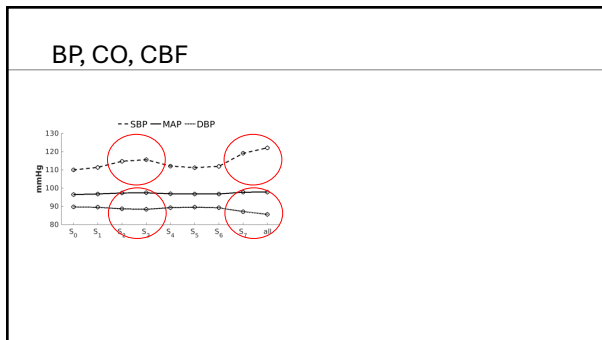
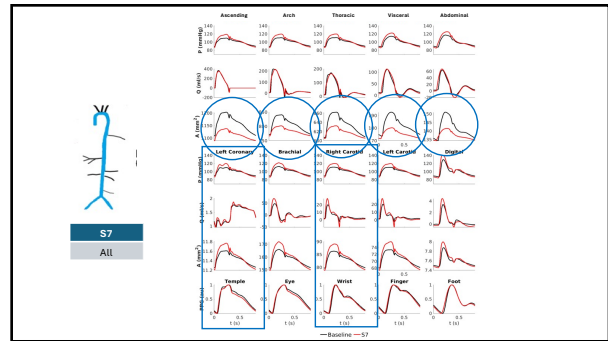
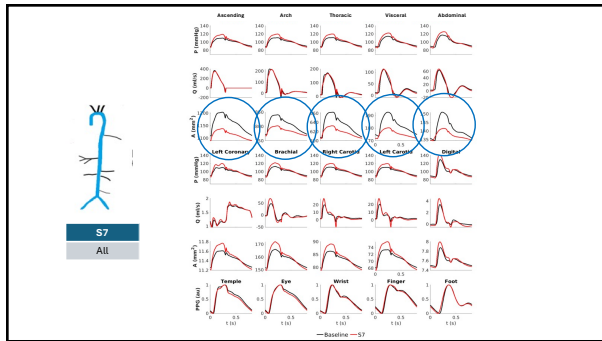
Clinical scenarios



S0	S1	S2	S4	S5	S7
No device	Ascending	Arch	Thoracic	Aorto-iliac	All

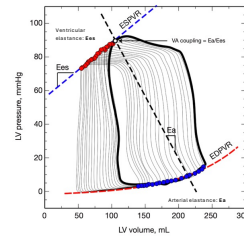






PHYSIOLOGY

Ventriculo-arterial (VA) Coupling



VA coupling (E_a/E_{es}) associated with optimum ventricular efficiency is 0.5

When required, VA coupling (E_a/E_{es}) can increase to 1 to maintain cardiac function

VA un-coupling can occur when $E_a/E_{es} > 1$, which then results in compromised cardiac function

If E_{es} is already low (HF, age, IHD) then a small increase in E_a can lead to VA uncoupling

Conclusion

- We have developed a validated model of the circulation and assessed the effect of endovascular stent graft placement in realistic clinical scenarios
- Shown a reduction in compliance in the stented segment with associated changes in pressure and flow in adjacent aortic segments and the aortic branches
- No significant changes were seen in cardiac output and coronary artery blood flow following endovascular stent graft placement
- Further studies are needed to evaluate the effect in individuals with different baseline characteristics