

Abstract

Perfusion and surgical management in patients with thoracic aortic disease

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This doctoral thesis comprises four studies investigating factors influencing short- and long-term outcomes after proximal thoracic aortic surgery for thoracic aortic aneurysms and acute Type A aortic dissections.

Study I evaluated a minimally invasive percutaneous femoral cannulation technique with vascular closure device decannulation in acute Type A aortic dissection surgery. Compared with traditional surgical cut-down, the technique proved safe and feasible, with low device failure rates and fewer access-site complications, including seroma, femoral nerve injury, and wound infection.

Study II examined the impact of sex on outcomes after elective proximal thoracic aortic aneurysm surgery in a Swedish nationwide cohort (2016–2020). Women had a twofold higher unadjusted 30-day mortality than men; however, this difference was no longer statistically significant after adjustment for age and comorbidities.

Study III assessed whether a more extensive surgical strategy involving hypothermic circulatory arrest and antegrade cerebral perfusion was associated with higher risks of stroke, dialysis, or 30-day mortality compared with a standard cross-clamp technique in patients with an aortic diameter of 40–50 mm distal to the brachiocephalic trunk. Both approaches demonstrated low complication rates, with no significant differences in mortality or reintervention during follow-up. These findings support an individualized approach to operative strategy selection.

Study IV was a systematic review and meta-analysis evaluating the influence of hypothermia level on outcomes after acute Type A aortic dissection surgery using antegrade cerebral perfusion. No differences in in-hospital mortality, stroke, or dialysis-requiring kidney failure were observed between mild ($>28^{\circ}\text{C}$) and moderate ($20\text{--}28^{\circ}\text{C}$) hypothermia. Evidence from studies directly comparing these temperature ranges indicated no advantage of colder temperatures when antegrade cerebral perfusion was used.