Severe Comorbidities and Mortality Risk Following Fenestrated Endovascular Repair of Complex Abdominal Aortic Aneurysms

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Introduction

Repair of complex aortic aneurysm repair remains one of the more technically challenging aspect of vascular surgery. Both open and endovascular techniques have been studied to determine the best approach to provide the best patient outcome. Endovascular repair has expanded the proportion of patients eligible for repair of complex abdominal aortic aneurysms, but concerns remain regarding appropriate patient selection given the high comorbid burden of this patient population.

Aim

The aim of this study is to examine the association between certain high risk comorbidities and short term- mid term survival

Materials and Methods

- Elective fenestrated endovascular repairs of complex abdominal aortic aneurysms in the VQI from 2014-2022
- Severe comorbidities included:
  - Dialysis
  - Home oxygen
  - Poor functional status (lack of independence with activities of daily living)
  - Ejection fraction (EF) <30%

Materials and Methods

- Adjusted perioperative mortality, Thoraco- Abdominal Life altering Events (TALE: the composite of death, permanent spinal cord ischemia, stroke and dialysis) were calculated using multilevel logistic regression, clustering by hospital and surgeon, and adjusted medium-term survival using cox regression.

Results

There were 3,613 repairs during the study period

- 38 (1.1%) were on dialysis
- 230 (6.4%) on home oxygen
- 84 (2.3%) poor functional status
- 80 (2.2%) EF<30%.

Perioperative death increased stepwise with the number of comorbidities present (none: 2.7%, one: 5.0%, two: 14.3%, over two: 100%).

- In adjusted analyses, **only EF<30% and dialysis were independently associated with perioperative death** (EF<30: OR 3.7 [1.6-8.9], P=.003; dialysis: OR 3.1 [0.6-14.7], P=.09)**TALE** (EF<30%: OR 2.8 [1.3-6.3], P=.01; **dialysis**: OR 6.2 [2.3-16.9], P<.001)
- **All conditions except poor functional status were independently associated with medium-term survival** (dialysis: HR 2.3 [1.2-4.5], P=.046; home oxygen: HR 1.7 [1.2-2.3], P=.003; EF<30%: HR 1.7 [1.05-2.9], P=.03)

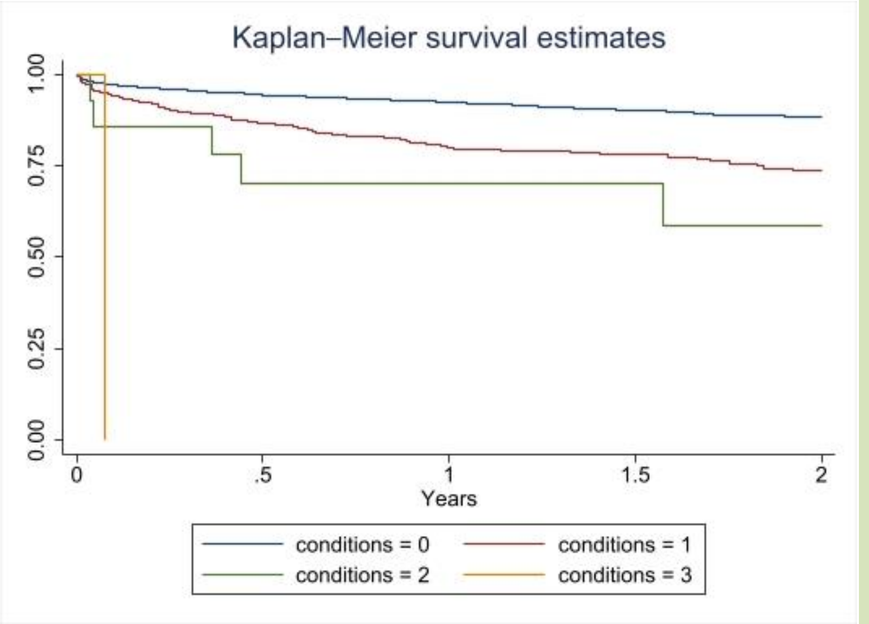

Figure 1: Kaplan-Meier Curve for short and mid-term survival *Survival decreased stepwise with the addition of each comorbidity, with one-year survival of 92%, 80%, 70% and 0% for none, one, two and over two comorbidities, respectively*

Conclusions

Severe comorbidities, especially low ejection fraction and dialysis, were associated with high perioperative and medium-term risk, with multiple conditions increasing risk exponentially. These data highlight the importance of careful patient selection for these complex repairs.

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