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Mild Elevation in Cardiac Troponin T is Independently Associated with Long-Term Mortality After Intermediate or High-Risk Vascular Surgery

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Abstract: **(Your abstract must use Normal style and must fit into the box. Do not enter author details)**

Introduction:
Myocardial injury is an established risk factor for adverse outcomes after non-cardiac surgery. However, the prevalence of cardiac troponin T (cTnT) sampling after vascular surgery has not been well studied, and whether mild perioperative cTnT elevation at levels typically indicative of Type 2 myocardial infarction ("demand ischemia") is associated with long-term mortality is not established.

Objectives:
To quantify the prevalence of cTnT sampling after vascular surgery in real-world practice, and determine if level of cTnT elevation is associated with mortality.

Methods:
This was a retrospective study of 13,196 patients who underwent intermediate or high-risk vascular surgery at a single center from January 1, 2010 – May 1, 2015. Patients were assessed for cTnT sampling within 96 hours of surgery. Cumulative 3 year mortality was stratified by absence of cTnT sampling, a normal value of <0.03 ng/mL, mild elevation of 0.03-0.10 ng/mL, or >0.10 ng/mL. Cox proportional hazards analysis was used to adjust mortality for patient characteristics.

Results:
Mean age was 66.2±14.4 years, and 5,357 (40.6%) were female. Troponin was sampled in 3,296 (25.0%) patients, and among those 747 (5.7%) were elevated (positive yield 22.7%). There were 1,858 (14.1%) deaths. After adjusting for Revised Cardiac Risk Index (RCRI) score, age, gender, and diabetes, degree of cTnT elevation remained independently associated with mortality (Table). On Kaplan-Meier analysis, all-cause mortality was greatest with elevated cTnT (p<0.0001, Figure – A) and was higher across degrees of cTnT elevation (p<0.0001, Figure – B).

Conclusions:
The degree of cTnT elevation independently predicts long-term mortality after vascular surgery. Even mild elevations of cTnT above threshold consistent with Type 2 myocardial infarction are associat
extends well beyond the acute post-operative period.

Table. Cox Proportional Hazards for Association with Mortality.

Variable	HR (95% CI)	p-value
Degree of cTnT Elevation		
>0.10 ng/mL vs Normal	2.91 (2.39-3.53)	<0.0001*
0.03 - 0.10 ng/mL vs Normal	2.18 (1.77-2.69)	<0.0001*
Not sampled vs Normal	0.99 (0.88-1.12)	0.87
>0.10 ng/mL vs 0.03-0.10 ng/mL	1.33 (1.05-1.70)	0.020*
RCRI score (0-6)	1.27 (1.22-1.32)	<0.0001*
Age (per 10 year increase)	1.33 (1.29-1.37)	<0.0001*
Gender (male)	0.99 (0.90-1.08)	0.76
Diabetes	1.05 (0.95-1.16)	0.37

Model was adjusted for all terms above. * Indicates significance at p<0.05.
cTnT indicates cardiac troponin T; HR, hazard ratio; CI, confidence interval; RCRI, Revised Cardiac Risk Index .