

Platelet Recovery and Perioperative Risk After Cardiac Surgery

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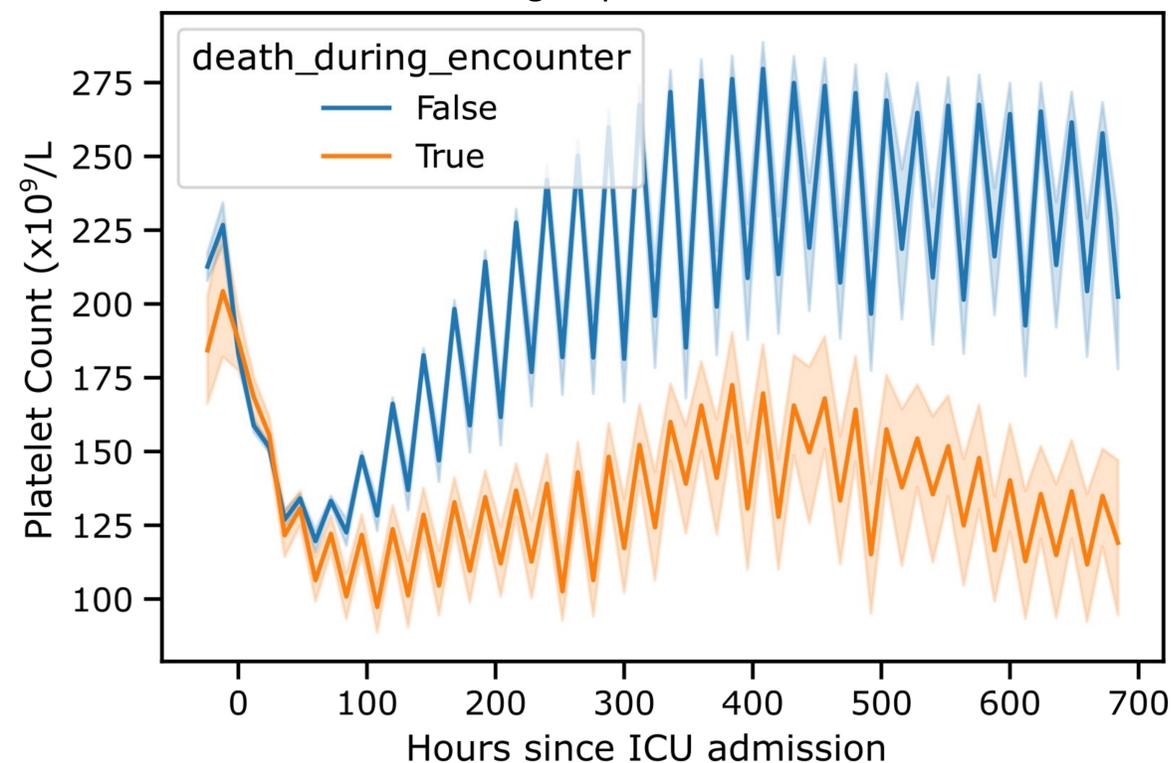
Summary

Platelet count was significantly different ($p < 0.05$) between survivors and non-survivors after cardiac surgery from about two days after surgery till death or hospital discharge

Background

- Approximately 1,000,000 people undergo cardiac surgery with cardiopulmonary bypass (CPB) in the United States each year and post-operative mortality is ~1%
- Patients that undergo CPB experience several physiologic changes, notably:
 - A significant decrease in platelet number and function
 - A transition from pulsatile to continuous systemic blood flow
- Postoperative care management of cardiac surgery patients is guided by standard vital signs such as blood pressure and cardiac output
- These metrics do not provide information about tissue oxygen delivery, which happens in the capillaries
- Some patients with adequate blood pressure and cardiac output still experience organ injury and death after CPB due to impaired microvascular perfusion and there is no pragmatic method of detecting it
- Bone marrow capillaries must replace the platelets lost to reestablish homeostasis, which requires blood flow

Figure 1. Platelet count over time in survivors (blue) and non-survivors (orange) after cardiac surgery. The shaded region indicates the 95% confidence interval for each group



Objective

- Determine the association between platelet recovery and mortality after cardiac surgery

Conclusions

- Platelet count recovery differed between survivors and non-survivors after only two days, while mortality occurred at ~2 weeks
- Failure of platelet count recovery following cardiac surgery may be an effective early warning sign to allow for targeted clinical interventions to improve survival after cardiac surgery

Methods

- Retrospective cohort study ($n = 6,867$) of patients receiving cardiac surgery with CPB who had serial platelet count measurements after surgery at the University of Colorado hospital between 2011 and 2021
- We compared platelet count over time in survivors vs. non-survivors

Table 1: Demographics of Survivors and Non-survivors

	All, n = 6,867	Survivors, n = 6215	Non-survivors = 652	P-Value
Age (mean, SD)	60.5 (13.7)	60.3 (13.7)	61.8 (13.5)	0.009
Female sex (N, %)	2,116 (30.8)	1899 (30.6)	217 (33.3)	0.165