



Severe bleeding complications after heart transplantation in adult : a single-center cohort study

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INTRODUCTION

Cardiac surgery with cardiopulmonary bypass (CPB) = high bleeding risk.

Bleeding after heart transplantation = largely unknown.

Universal definition of perioperative bleeding (UDPB).

Objectives

- Describe the incidence of severe postoperative bleeding after heart transplantation,
- Identify factors associated with postoperative bleeding ,
- Assess the impact on morbidity and mortality.

METHODS

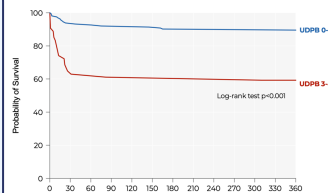
- Single-center retrospective – 2012 to 2022.
- 217 patients with orthotopic cardiac transplantation.
- Severe postoperative bleeding : UDPB score ≥ 3 .
- Confounder for mortality : preoperative bilirubin, duration of CPB, ECMO within 12 hours of surgery.

217 consecutive patients included

UDPB 3-4 : 54 (25%)
 UDPB 1-2 : 59 (27%)
 UDPB 0 : 104 (48%)

Factors independently associated with severe bleeding events :

- Long term mechanical cardiac support** (adjOR 6.84 [2.15-25.0]),
 - Duration of CPB** (per 10 min increase, adjOR=1.15 [1.07-1.25]).
- Use of ECMO as bridge to transplant and preoperative critical status : included potentially clinically relevant association, without significant results (adjOR = 3.14 [0.82-12.4]), adjOR = 2.35 [0.98-5.88]) respectively).



One-year survival according to post-operative bleeding severity

UDPB score	All patients n = 217	1-year Mortality	Unadjusted Cox model			Multivariable Cox model		
			HR	95% CI	P	HR	95% CI	P
0 to 2	163 (75)	17 (10)	REF	-	-	REF	-	-
3 to 4	54 (25)	22 (41)	4.94	2.62-9.31	<0.001	2.01	0.90-4.46	0.087

Impact of severe perioperative bleeding on one-year mortality

RESULTS

Characteristic	No.	All patients (n = 217)	Non-severe bleeding (n = 163)	Severe bleeding (n = 54)	P-value
Post-operative lab results					
Hemoglobin - g.dL ⁻¹	193	11.1 (9.8-12.4)	11.5 (10.3-12.6)	9.30 (8.5-11.1)	<0.001
Hematocrit - %	195	34 (29-37)	35 (31-38)	29 (25-34)	<0.001
Platelets – G.L ⁻¹	195	129 (104-170)	136 (110-177)	114 (90-139)	0.002
INR	180	1.4 (1.3-1.6)	1.4 (1.3-1.5)	1.5 (1.4-1.8)	<0.001
Maximum lactatemia - mmol.L ⁻¹	144	7.6 (4.1-10.8)	6.7 (4.0-10.2)	10.0 (5.0-12.0)	0.021
Post-operative morbidity					
Primary graft dysfunction	215	92 (43)	50 (31)	42 (78)	<0.001
ECMO post-CPB (<12 hours)	216	53 (25)	18 (11)	35 (65)	<0.001
Max dobutamine dose - $\mu\text{g.kg}^{-1}.\text{min}^{-1}$	207	9.0 (5.5-14.5)	7.8 (5.1-12.2)	12.9 (7.2-16.8)	<0.001
Duration of dobutamine use - days	206	7 (5-11)	7 (5-10)	10.0 (6.0-16.5)	0.005
Max norepinephrine dose - $\mu\text{g.kg}^{-1}.\text{min}^{-1}$	200	0.2 (0.0-0.5)	0.1 (0.0-0.4)	0.6 (0.2-1.9)	<0.001
Atrial fibrillation	217	27 (12)	17 (10)	10 (19)	0.119
Renal replacement therapy	217	50 (23)	28 (17)	22 (41)	<0.001
Duration of mechanical ventilation - days	215	1 (1-5)	1 (1-3)	6 (1-13)	<0.001
Stroke	217	12 (6)	8 (5)	4 (7)	0.499
Ventilator-associated pneumonia	217	57 (26)	34 (21)	23 (43)	0.002
Mediastinitis	217	13 (6)	8 (5)	5 (9)	0.318
Bacteremia	217	31 (14)	18 (11)	13 (24)	0.018
Thrombo-embolic event	217	13 (6)	9 (6)	4 (7)	0.741
Length of stay in intensive care unit - days	217	13 (10-19)	12 (10-17)	18 (10-27)	0.078
Mortality					
In-hospital mortality	217	33 (15)	12 (7)	21 (39)	<0.001
Mortality at D30	217	33 (15)	12 (7)	21 (39)	<0.001
Mortality at D90	217	34 (16)	13 (8)	21 (39)	<0.001
1-year mortality	217	39 (18)	17 (10)	22 (41)	<0.001

Post-operative outcomes

