

**SCA 53**  
**MONITORING PLATELET FUNCTION DURING CARDIOPULMONARY BYPASS IN THE PRESENCE OF TIROFIBAN**

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**Introduction:** The use of tirofiban with heparin has been reported in the literature (1), but there is no consensus on the monitoring of the degree of platelet glycoprotein (GP) IIb/IIIa blockade during cardiopulmonary bypass (CPB). We report a case where heparin in combination with tirofiban was used for anticoagulation, and GPIIb/IIIa blockade was monitored with two bed-side coagulation monitors.

**Methods:** 55 year-old patient with a history of heparin anaphylaxis, with a negative ELISA heparin-PF4 assay, was scheduled for an elective coronary bypass surgery. Tirofiban (10mg/kg) was administered intravenously prior to systemic heparinization, and tirofiban infusion (0.15mg/kg/min) was continued approximately 60 minutes prior to the estimated discontinuation of CPB. Platelet function was monitored with Plateletworks (Helena Laboratories, Beaumont, Texas) and kaolin-activated heparinase (4U/mL)-modified thromboelastogram (TEG, Haemoscope, Niles, IL) using the whole blood. For Plateletworks, % platelet aggregation was calculated from the following formula; (baseline platelet count – aggregated platelet count)/baseline platelet count.

**Results:** There was a transient drop in the platelet count during CPB (Table). Platelet aggregation induced by ADP (20mM) was completely suppressed on Plateletworks, whereas the maximum suppression of GPIIb/IIIa receptors was not achieved on TEG. Recovery of platelet count and function were seen by the time of ICU arrival, and the patient did not require hemostatic product transfusion.

**Discussion:** The fall of platelet count during CPB is partly explained by hemodilution, but subsequent partial recovery (115 to 176/mm<sup>3</sup>) suggests that it might be associated with GPIIb/IIIa blockade itself, as Integrilin is known to cause transient platelet count drop (2). Compared to the conventional platelet aggregometry, Plateletworks provides results with ease and rapidity. Because tirofiban is a reversible GPIIb/IIIa inhibitor, a recovery of platelet GPIIb/IIIa receptor function may have occurred during TEG evaluation, and lead to a submaximal inhibition. The difference between two devices may also stem from the different activators, ADP (PW) and endogenous thrombin (TEG) for platelet activation. Further studies are required to determine the optimal agonist(s) and concentrations required to best monitor platelet function in cardiac surgical patients receiving platelet inhibitors.

	Plateletworks			TEG		TEG (+abciximab)	
	PLT (EDTA)	PLT (ADP)	% aggregation	R	MA	R	MA
Baseline	361	155	57.1	8.5	69	8.5	27.5
Heparin	288	279	3.1	23	59.5	19	21
CPB 30min	97	92	5.2	5	44	6	10
CPB 60min	117	115	1.7	6.5	49.5	7	12.5
Protamine	115	104	9.6	10	51	10.5	11.5
ICU	176	89	49.4	6.5	60.5	7	15

**References:** 1) Journal of Thoracic & Cardiovascular Surgery. 122(6):1254-5, 2001; 2) American Journal of Cardiology. 88(4):428-31, 2001