

A101

TITLE: EMERGENCY CORONARY ARTERY BYPASS SURGERY: IDENTIFICATION OF HIGH-RISK SUBSETS
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Emergency coronary artery bypass (CAB) has become an important part of cardiac anesthesia practice. Although most anesthesiologists consider emergent failed coronary angioplasty (PTCA) to be a very high-risk subset, no data have yet compared this subset with the previously more common group of patients undergoing emergent CAB - those with refractory ischemia developing on the ward or in the ICU. In addition, prior studies of emergent CAB reported during the early days of PTCA did not include many patients with multivessel angioplasty or those undergoing angioplasty for unstable angina. Accordingly, we analyzed our recent experience with truly emergent CAB to identify characteristics which identify the highest risk subsets of this population.

With IRB approval, 125 patients undergoing emergency CAB for acute refractory ischemia were prospectively evaluated. Emergent CAB was performed for failure of PTCA and instability in the cardiac cath lab in 98 patients. Refractory ischemia developed in the remaining patients while on the ward or ICU. All operations were performed within 4 hours of surgical consultation, most within one hour. Patients were divided into 3 groups: failed PTCA with circulatory stability (FA-stable), failed PTCA with circulatory instability (FA-unstable), and non-cath lab emergencies (NON-PTCA). Intergroup comparisons of perioperative demographics and outcomes were performed with X² analysis and ANOVA. Stepwise logistic regression was used to identify variables predictive of morbidity (low CO syndrome, renal or pulm failure, stroke, postop infection) or mortality.

Patients in the NON-PTCA group were the oldest and had the greatest incidence of preop pulmonary hypertension, serious arrhythmias, preop cerebrovascular disease, and recent MI. FA-stable patients were the youngest and had the lowest incidence of serious arrhythmias, recent MI and preop IABP use. There was no difference in the number of vessels bypassed (x=2.4±1.0), the ischemic clamp time (x=57±26 min), or the incidence of unstable angina (x=86%), CHF (x=18%), left main CAD (x=18%) or reoperation (x=17%) between groups. Morbidity and mortality were least in the FA-stable group.

	FA stable	FA unstable	NON-PTCA	Overall	P
# of patients	77	21	27	125	
Intraop death (%)	1.3	4.8	14.8	4.8	.018
In-hospital death (%)	2.6	23.8	22.2	10.4	.001
Low CO syndrome (%)	9.2	25.0	30.4	16.0	.025
Pulmonary failure (%)	5.3	20.0	21.7	10.9	.031
Renal failure (%)	6.6	15.0	0	6.7	.146
Stroke (%)	0	20.0	8.7	5.0	.001
Postop infection (%)	3.9	15.0	13.0	7.6	.136
≥ 1 morbid event (%)	14.5	35.0	34.8	21.8	.035

Logistic regression identified preop cerebrovascular disease, CHF, preop CPR and need for a IABP before emergent CAB as significant risk factors for morbidity/mortality. Age, gender, left main CAD, diabetes, reoperation, preop renal failure and recent MI did not have predictive value.

We conclude that true emergency CAB carries a high risk, particularly in those patients who experience circulatory instability in the cardiac cath lab as well as those with coronary anatomy unsuitable for angioplasty. Patients with circulatory stability taken to the OR emergently from the cath lab appear to have an operative risk which is not markedly different from nonemergent cases. These findings merit consideration when making therapeutic decisions concerning this group of critically-ill patients.

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TITLE: CIRCADIAN VARIATION OF POSTOPERATIVE ISCHEMIA AND INFARCTION IN NONCARDIAC SURGERY PATIENTS
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In awake ambulatory patients, myocardial ischemia has been shown to increase in incidence in the morning.[1] Coincident with the morning rise in ischemia, myocardial infarctions (M.I.) also exhibit a circadian variation in onset, with the greatest number occurring within the first 3 hours of awakening. Postoperative myocardial ischemia and infarctions have been associated with tachycardia and such clinical situations as endotracheal suctioning and weaning from mechanical ventilation. We therefore hypothesized that due to these factors, the normal circadian variation in ischemia and infarction would not be present during the postoperative period.

METHODS: After informed consent, 148 patients with either known, or risk factors for, coronary artery disease, were monitored (SpaceLabs ambulatory ECG 90205/FT2000 analysis system) with modified lead V5 from prior to elective surgery through the third postoperative day (~80 hrs). Significant ST segment changes were defined as ≥1 mm horizontal or downsloping ST segment depression or ≥2 mm ST segment elevation. Abnormal ECG strips were reviewed blindly. A cardiac event was defined as death from a cardiac cause, M.I., unstable angina requiring treatment, acute ischemic pulmonary edema. The onset of the event was defined as the time of the onset of symptoms, or 8 hours prior to the rise in CK-MB.

RESULTS: We observed 10 cardiac events in the 148 patients. Eight patients sustained an M.I., the onset of which was determined by symptoms in 6/8. One patient developed unstable angina and the final patient developed ischemic pulmonary edema. The times of onset for all episodes of myocardial ischemia (silent and symptomatic) and acute events are shown in Figure 1.

DISCUSSION: We observed a difference in the circadian pattern of myocardial ischemia as compared to myocardial infarction. Postoperative ischemia retained a circadian variation in occurrence similar to that in ambulatory subject. In contrast, postoperative ischemic cardiac events occurred predominantly in the evening. This work suggests that ambulatory and perioperative ischemic cardiac events may have different etiologies.

REFERENCES:
 1. Mulcahy, et al. Lancet 755-759. 1988

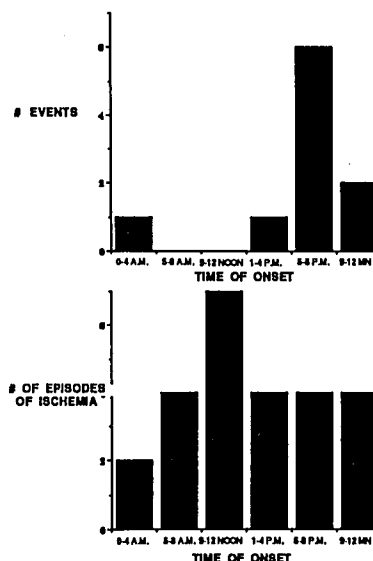


Fig 1- Comparison of time of onset of myocardial ischemia vs. cardiac events