

**Title: PATIENTS WITH REOPERATION FOR CORONARY ARTERY GRAFTING SURGERY REPRESENT GREATER RISKS****Authors:** C. Brummett, M.D., J.G. Reves, M.D., P.N. Samuelson, M.D., W.A. Lell, M.D., E. Buttner, M.D., R. Allarde, M.D., L.F. McGovern, D.O., S. Oget, M.D., and L.R. Smith, M.A.**Affiliation:** Department of Anesthesiology, The University of Alabama in Birmingham, Birmingham, AL 35294

**INTRODUCTION:** The incidence of reoperations for coronary artery bypass grafting (RCABG) has increased fifteen fold over the past five years at our hospital, accounting for 4.6% of such operations in 1981. Despite the increase frequency of this operation, there is little information to guide anesthetic management. This study was designed to examine the perioperative problems, interventions, and medications of concern to the anesthesiologists caring for RCABG patients compared to routine CABG patients.

**METHODS:** One year's (1981) experience of RCABG was examined with Institutional Review Board approval. During this period, 59 patients underwent RCABG and were matched with 59 CABG patients anesthetized contemporaneously with a similar age, surgeon, and anesthetic technic. Comparisons of the two groups included the following data: age; severity of complicating diseases; medications; heart catheterization data; anesthetic agents; duration of pump time, aortic cross-clamp time and operation; and support medications pre and postbypass during surgery. Postoperative data included: support medications; incidence of various arrhythmias; hypertension, hypotension or low cardiac output; time of extubation and CICU stay; hemoglobin, blood administration and chest drainage at 12 hrs postoperatively; incidence of myocardial injury or infarct on the EKG on the third day; CKMB on three successive postoperative days; IABP use; re-entry for bleeding; and mortality. Mean data between groups was compared for statistical difference with a Student's T test or by Chi-square test when appropriate.

**RESULTS:** (Refer to Table.) On admission, RCABG patients were on digitalis therapy more frequently than controls, had greater frequency of unstable angina, and a lower evidence of involvement of the left main coronary artery disease. History of arrhythmias and congestive heart failure tended to be more frequent in the reoperative group without reaching a statistically significant level. All other preoperative variables were similar. During operation, anesthetic techniques and pharmacologic interventions were similar in both groups. Duration of anesthesia and duration of bypass were greater with RCABG patients; number of grafted vessels were different but cross-clamp time was not. The stay in CICU was longer in the RCABG group. At the measurement interval 12 hrs after surgery, the hemoglobin was less and the administration of blood was greater for the reop group. Surgical reoperation for bleeding occurred in 5 CABG and 1 RCABG (NS). Duration of intubation was similar. Mean CPK and CKMB tended to be higher in the RCABG patients, but not significantly so. EKG changes were similar, but if CKMB criteria (CKMB > 15 IU/L) are applied, the incidence of important necrosis is greater ( $p < .05$ ) in the RCABG patients (33 vs 21 patients). Three patients required IABP assistance and there were 3 deaths, all in the RCABG group.

**DISCUSSION:** When incidence of individual complications were compared between the 2 groups, single complica-

tions were often not significantly different because of the relatively small sample size ( $n = 118$ ) and low incidence of each complication. However, after pooling "complications" (mortality, IABP assistance and enzyme criteria fulfilling myocardial infarction, etc.) the RCABG group have a significantly ( $p = .01$ ) higher complication rate than CABG patients. It is not known whether this is attributable to 1) the prolonged CPB time or 2) to the fact that despite identical age, equivalent cross-clamp time, and similar coronary disease, the RCABG patients had poorer ventricular function. The differences in preoperative digitalis, and anginal patterns (unstable) could indicate that RCABG patients have poorer preoperative ventricular function, though the ejection fraction and LVEDP at cath were similar. Possible explanation for greater CKMB evidence of damage in RCABG patients are: 1) increased non coronary collateral flow compromised myocardial protection and 2) less complete revascularization (fewer grafts). The conclusion is clear: RCABG patients have a greater incidence of complications than CABG cohorts matched for age. We may expect longer extracorporeal circulation and operation times, greater need for blood, as well as longer and more complicated CICU stays. We may also expect increasing numbers of RCABG patients in the future.

**CHARACTERISTICS OF REOPERATIVE CABG (RCABG) AND CABG PATIENTS**

	CABG (n=59)	RCABG (n=59)	P
Age	58 ± 6.8	59 ± 6.7	NS
Unstable angina	30	38	.049
Left Main Coronary Artery Disease	14	4	.035
Arrhythmia	8	15	.096
CHF	5	10	NS
Digitalis	7	24	.0002
LV Ejec Frac (%)	.49 ± 1.78	.46 ± .179	NS
LVEDP (mmHg)			
pre-injection	14 ± 6.9	14 ± 10.6	NS
post-injection	22 ± 9.6	20 ± 6.7	NS
Anesthesia (min)	226 ± 69	309 ± 103	.009
Bypass (min)	81 ± 25	98 ± 38	.007
Vessels Grafted (#)	4.2 ± 1.74	3.4 ± 1.32	.03
Cross-clamp (min)	51 ± 22.8	49 ± 22.5	NS
Chest Drainage (12 hrs postop)	597 ± 402.2	615 ± 334.7.8	
Hb (12 hrs postop)	10.5 ± 1.01	9.6 ± .18	.0003
Blood Administered (ml-12 hrs postop)	570 ± 442.9	794 ± 677	.041
CKMB			
(postop day 1)	19.6 ± 29.2	65.5 ± 195.2	NS
(postop day 2)	1.2 ± 2.3	37.6 ± 160.2	NS
CICU stay (hrs)	23.8 ± 5.6	31 ± 20	.009
Intubation (hrs)	13.30 ± 4.32	13.43 ± 4.24	NS
Death	0	3	NS