

Immediate Postoperative Extubation of the Coronary Artery Bypass Patient A Safe Measure to Reduce ICU Time and Hospital Length of Stay

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Introduction

Immediate extubation of coronary artery bypass patients in the operating room has not been widely practiced. Concerns of safety and feasibility have been cited (Wartler, et al., 2003 and Montes, et al., 2000). With the advent of off-pump surgery, the practice of immediate extubation has been described (Djaiani, et al., 2001 and Roysse, et al., 1999). We hypothesized that the immediate extubation of both OPCAB and CABG patients in the operating room would lead to reduced resource utilization and hospital length of stay.

Methods

We reviewed our institutional Society of Thoracic Surgeons (STS) database for all adult patients undergoing coronary artery bypass surgery from May 2003 through May 2006. All 943 patients identified were included in the analysis and comprised both on and off-pump techniques. All surgeries were performed at a single cardiac specialty hospital by a team of five surgeons and three anesthesiologists. The same patient room served as the recovery, intensive care, and general care room.

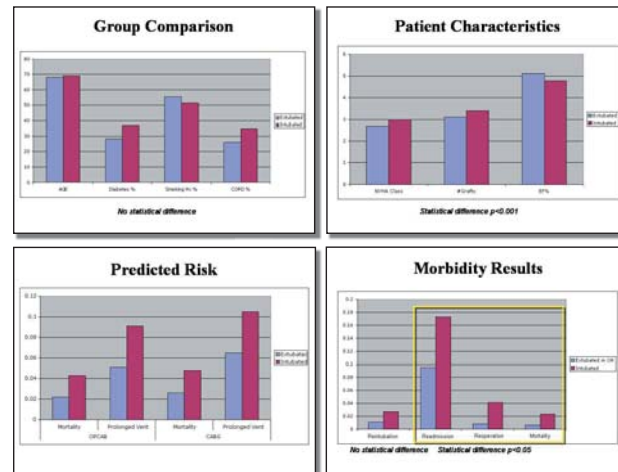
Anesthetic techniques were similar and included preoperative sedation with midazolam (0.1-0.04 mg/kg) for placement of invasive monitoring lines. General anesthesia was induced with etomidate (0.1-0.25 mg/kg) and maintained with a volatile anesthetic agent, fentanyl (5-10 mcg/kg) and cisatracurium as required for neuromuscular blockade. Postoperative analgesia was accomplished with morphine patient-controlled analgesia or thoracic epidural analgesia with ropivacaine 0.2%, fentanyl and morphine. Immediate extubation was accomplished, when feasible, at the discretion of the anesthesiologist.

We examined the incidence of adverse events between groups of patients who were immediately extubated (Early group) and those who were extubated any time after leaving the operating room (Late group) using Fisher's exact test. Morbidity and mortality were defined according to STS criteria. The duration of intensive care status and hospital length of stay was compared using the Mann-Whitney U test. Comparisons of comorbidity between groups were made using unpaired T-testing.

Results

The groups showed no statistical differences in age or incidence of diabetes, cigarette smoking and chronic obstructive pulmonary disease (COPD). Statistically significant differences were observed in the New York Heart Association class (2.5 Early versus 3.0 Late), the number of distal anastomoses (3.1 Early versus 3.4 Late) and the ejection fraction (51% Early versus 46% Late).

Of 943 patients, 723 (76.7%) were extubated in the operating room. Seven hundred patients (74.2%) underwent off-pump surgery. On-pump CABG included those using cardiopulmonary bypass with or without cardioplegia.



The incidence of reintubation was low and not statistically significant between groups. There were significant differences in the readmission, reoperation, and mortality rates (Table 1), with the early extubation group showing reduced rates in all categories. The duration of intensive care unit stay and hospital length of stay was also reduced in patients who were extubated immediately (Table 2).

Timing of Extubation in CABG Patients

Table 1

	Extubated Early n=723	Extubated Late n=220	Fisher's Exact Test p Value
Reintubation	8/723 (1.1%)	6/220 (2.7%)	0.107
Readmission	69/723 (9.5%)	38/220 (17.3%)	0.002
Reoperation	6/723 (0.8%)	9/220 (4.1%)	0.002
Mortality	4/723 (0.6%)	5/220 (2.3%)	0.036

Table 2

	Extubated Early n=723 Mean±S.D. Median (25%tile, 75%tile) Minimum, Maximum	Extubated Late n=220 Mean±S.D. Median (25%tile, 75%tile) Minimum, Maximum	Mann-Whitney U Test p Value
ICU Stay (hours)	11.3±54.7 2.0 (2.0, 12.1) 1.50, 1414.0	26.8±34.9 16.95 (6.0, 25.9) 1.50, 187.0	<0.001
LOS (days)	3.8±2.9 3.0 (3.0, 4.0) 0.00, 61.00	4.6±2.2 4.0 (3.0, 5.0) 0.00, 18.00	<0.001

Discussion

We conclude that routine immediate extubation of patients undergoing coronary artery bypass surgery may be performed safely. It is evident that patients with more severe comorbidities are more likely to require postoperative mechanical ventilation, longer hospital stays and suffer greater morbidity. However, there is no reason to prohibit immediate extubation of the CABG patient who meets acceptable criteria for extubation. Further study is needed to determine whether unnecessarily prolonging intubation itself adversely affects outcome or length of stay.

References

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