

Preoperative Selection Of Patients For Post Cardiac Surgical Fast-Tracking: An Analysis*

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Introduction:

A retrospective analysis has been made of 117 consecutive adult cardiac surgical operations performed by a single consultant cardiac surgeon with the same consultant anaesthetist over a period of twelve months.

The anaesthetic and surgical management of all these patients was compatible with the intention of extubating them immediately after completion of surgery. The details of this technique have been well documented previously.

This study analyses the high percentage of patients that can be managed successfully with early extubation, despite a wide range of co-existing clinical problems. The principal clinical reasons for not proceeding with this planned fast-tracking approach are identified.

Data-base:

117 adult patients (98 male, 19 female) with an age range from 23-79 years were involved in this retrospective study. No patient was excluded from this group, which represented all the patients over a twelve-month period involving the same surgeon and anaesthetist.

The clinical data was compared for those patients who were successfully extubated at the end of surgery (Group E) and those who were ventilated for a period of at least four hours post-operatively (Group V). There were 96 patients in Group E and 21 in Group V. 4 of the patients in Group V had been extubated initially but subsequently required re-

intubation. *The demographic data and types of operation are shown in Table 1.* There were two deaths—both patients were in Group V: one of these was a 34 year old woman with severe systemic lupus erythematosus causing renal failure (pre-operative serum creatinine = 770), widespread arteritis with severe coronary arteritis and poor ventricular function. She died 48 hours post-operatively after quadruple vein bypass despite maximal inotropic and renal support. The second of these patients was a 66 year old diabetic female with severe triple valve disease and end-stage myocardial failure (pre-operative ejection fraction = 18%) resulting in ascites and pulmonary hypertension (pre-operative mean pulmonary artery pressure = 47mmHg).

TABLE 1

	Group E (n = 96)	Group V (n = 21)
Male	83	15
Female	13	6
Mean Age	55.5	63.3
Coronary Bypass	79	15
Re-do Coronary Bypass	8	3
Single Valve Replacement	3	0
Double Valve Replacement	0	1
Re-do Single Valve Replacement	0	1
Valve Replacement and		
Coronary Bypass	4	1
Aortic Root Surgery	2	0

She died twelve hours post-operatively after aortic and mitral valve replacement despite maximal inotropic support.

The relative incidences in the two groups offer readily identifiable pre-operative risk factors as shown in Table 2.

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2. Inadequate respiratory function or gas exchange.
3. Hypothermia or abnormal metabolic status.
4. Inadequate haemostasis.
5. Unstable cardiac rhythm.

Of the few patients who required re-intubation, two were due to rhythm problems and associated low cardiac output, one due to inadequate respiratory function and one due to surgical bleeding.

For the remaining seventeen patients in Group V the principal reason for electively choosing to ventilate post-operatively was low cardiac output in eight cases, inadequate respiratory function in four cases, coagulation or bleeding problems in two cases, rhythm problems in two others and one patient had profound metabolic problems relating to pre-existing renal failure (pre-operative creatinine = 750umol/L) requiring early post-operative dialysis.

Although pre-operative risk assessment may help identify a likelihood of needing post-operative ventilation it can be seen from the data presented here that no specific pre-operative factor is an absolute indicator for post operative ventilation and more importantly some factors popularly cited as reasons for continuing ventilation such as obesity, emphysema or asthma and re-do surgery may have no relevance in reaching that decision. Specifically, nine of the twelve patients undergoing re-do coronary artery surgery were successfully fast tracked as were four of the five obese patients in this study. There were four patients with clinically severe chronic obstructive airways disease, all were successfully fast tracked—indeed it has been our experience that these patients particularly benefit from early extubation in order to overcome the problems of air trapping and the subsequent tamponade effect of over inflated lungs that frequently occurs in these patients after closure of the sternum, with positive pressure ventilation.

There was significantly a higher proportion of females in Group V; from 19 female patients 6 were in Group V (40%); from 98 male patients, only 15 were in Group V (15.3%) and a similar bias towards the older patient—although both of the oldest patients in this study (at 79 years of age) were in fact in Group E.

Not surprisingly, a high proportion of the patients in Group V had poor pre-operative myocardial function—over 70% compared to 12% in Group E. However, the difference between the groups with regard to other pathologic conditions was much less obvious.

Unstable angina—19% from Group V and 10.4% from Group E; presumably because many of the patients with unstable angina still had good ventricular function at the time of surgery. Two patients had emergency revascularisation performed following failed coronary angioplasty and both of these patients were successfully fast tracked.

Diabetes - 38.1% from Group V and 23% from Group E.

Renal Failure - 23.8% from Group V and 5.25% from Group E.

Carotid artery disease - 9.5% from Group V and 1.04% from Group E.

Obesity - 4.7% from Group V and 4.16% from Group E.

Asthma/Emphysema - no patients in Group V, 4.16% in Group E.

Dysrhythmias - 23.8% from Group V and 4.16% from Group E.

Alcohol Abuse - 4.7% from Group V and 2.08% from Group E.

Re-do Surgery - 14.3% from Group V and 9.375% from Group E.

Conclusion:

It is a practical proposition to fast track and extubate the majority of patients in adult cardiac surgical practice. Whilst helpful information pre-operatively can be gained with regard to the need for post-operative ventilation the decision to ventilate should be made towards the end of the operation based on the clinical situation at that point rather than on pre-operative guesswork.