

EARLY EXTUBATION , DOES IT REALY EFFECT ON PATIENT OUTCOME

Introduction:

After cardiac surgery, prolonged intubation and mechanical ventilation have been associated with increased hospital and intensive care unit length of stays; higher hospital costs; and morbidity resulting from pneumonia and atelectasis. (1) Moreover, extubation within 6 hours has been shown to be safe and effective even in elderly patients, with no increased risk of reintubation. (2) Following cardiac surgery, early extubation is a key step in the enhanced recovery pathway as it allows for early mobilization and a quick return to a regular daily activity. The aim of this study was to analyze the safety of early extubation after Robotic assisted cardiac surgery (Ultrafast and fast track) compare to delayed extubation, and to assess the significant reduce ICU and hospital length of stay, Mortality rate , blood transfusion , reopreting for bleeding and readmission to ICU. The ultrafast track extubation is (Extubated in the Operating room), fast track extubation is (Extubated within six hours of ICU admission) and delayed extubation witch were done due to high risk patients or at the beginning of program is (more than six hours).

Material and Methods:

A retrospective analysis of 184 patients were operated via Robotic assisted cardiac surgery in King Faisal specialist hospital, Riyadh, Saudi Arabia between February 2019 – 2022. The patients were divided into Three groups, ultrafast track extubation 41 patients 23% (Extubated in the Operating room), fast track extubation 16 patients 8% (Extubated within six hours of ICU admission) and delayed extubation 127 patients 69% (more than six hours). These three groups were compared interim of survival, hospital length of stay, number of blood transfusion and readmission to hospital and ICU. Mean age of the whole sample were 49, majority of patient were female (66%), body mass index was as low as minimum10 kg/m2 and as high as 61 kg/m2 mean 28.9 ± 7.2 kg/m2, one third of the whole sample were having diabetes, hypertension and pulmonary hypertension, 10 % were on decompensated heart failure, tow third of the patient were having NYHA III-IV, 8.2 % were having chronic kidney disease and 1.6% of them were on intermittent hemodialysis. Table -1 summarized the baseline characteristics for each group separately.

Table -1 Baseline characteristics				
	Ultrafast (n=41)	Fast (n=16)	Delayed (n=127)	P value Ultrafast -fast vs Delayed
Age (mean ± st.d)	45+/- 14	44+/- 14	51+/-14	0.064
Female (%)	63	37	70	0.011
Body Mass Index (mean ± st.d)	28.4 +/- 5.9	28.2+/- 8.3	29+/- 7.5	
STS score (mean ± st.d)	0.87+/- 0.61	0.93+/- 0.7	2.34+/- 2.46	0.001- 0.057
Diabetes Mellitus (%)	29	31	29	
Hypertension (%)	29	43	34.6	
Chronic kidney disease (%)	2.4	6.2	10.2	
Dialysis (%)	0	6.2	1.6	
Decompensated Heart Failure (%)	4.8	0	14	
Atrial fibrillation (%)	12	12.5	46.5	0.0001 - 0.014
Stroke (%)	4.8	0	7.9	
Pulmonary hypertension (%)	26.8	43.8	40.2	

Results:

performing ultrafast and fast extubation was applied at our institution since the beginning of robotic program to enhance post cardiac surgery recovery. There were 4 readmission to the ICU in the delayed group and none for the other two groups (p=0.7), post discharge readmission and mortality were not significant among the groups (p=0.9). when looking for hospital length of stay there was significant reduction in the ultrafast group compare to fast and delayed, 4 days vs 4.5 days vs 8 days respectively (p= 0.0001) [fig-2].

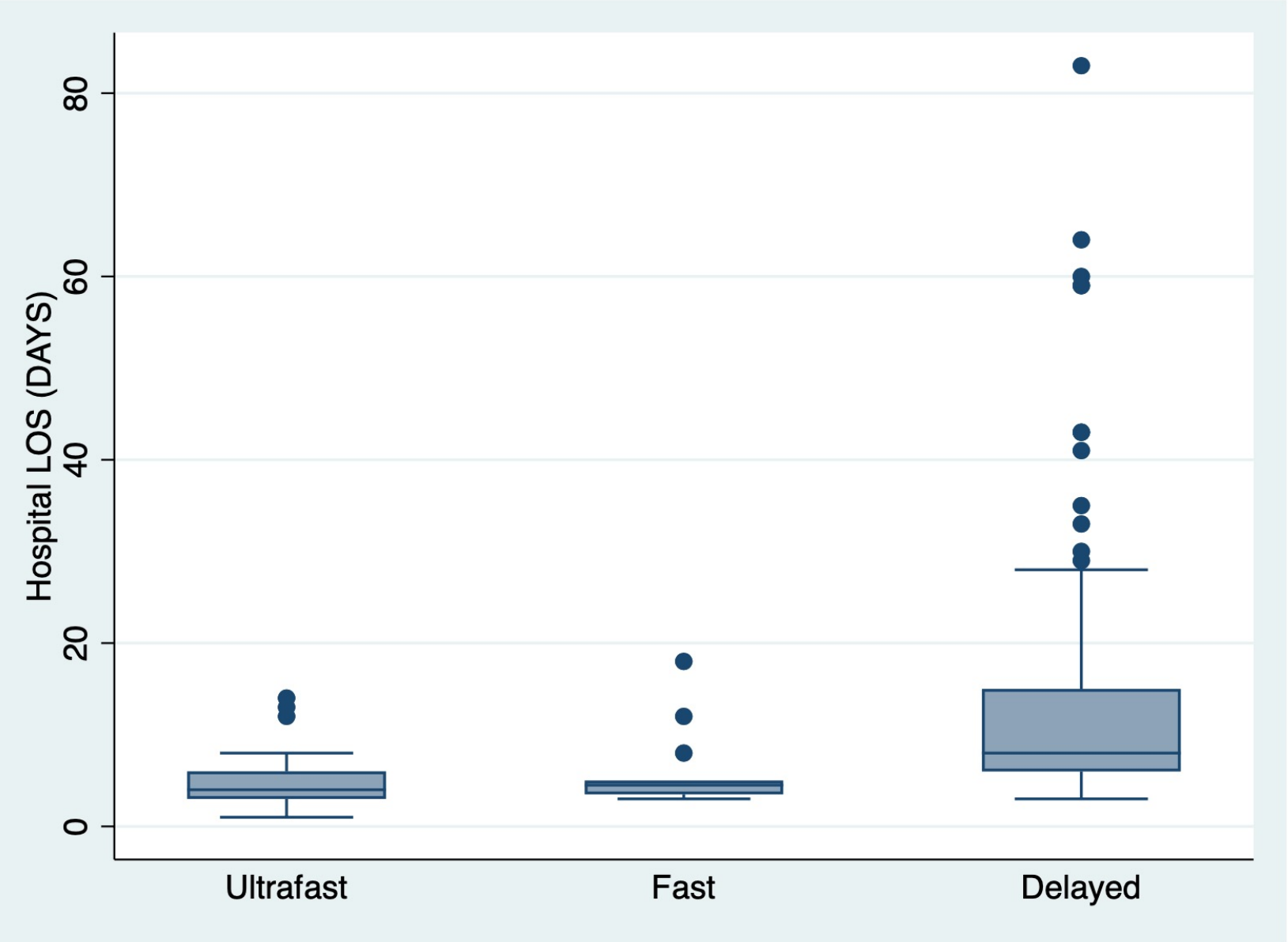


Figure 2hospital length of stay between the three groups (p=0.0001)

Blood transfusion was also significantly higher with delayed extubation group when compare to ultrafast and fast group ultrafast required more than 1 unit of blood transfusion 21 patients, fast required more than 1 unit of blood transfusion were 7 patients, delayed required more than 1 unit of blood transfusion were 104 patients, 81.9% vs 51% vs 43.7% respectively.(p =< 0.0001). half of the patient from ultra-fast and fast group did not require blood transfusion compare with 18 % of delayed group (p= < 0.0001). There were no statistically significant in the survival between the three groups [fig.3].

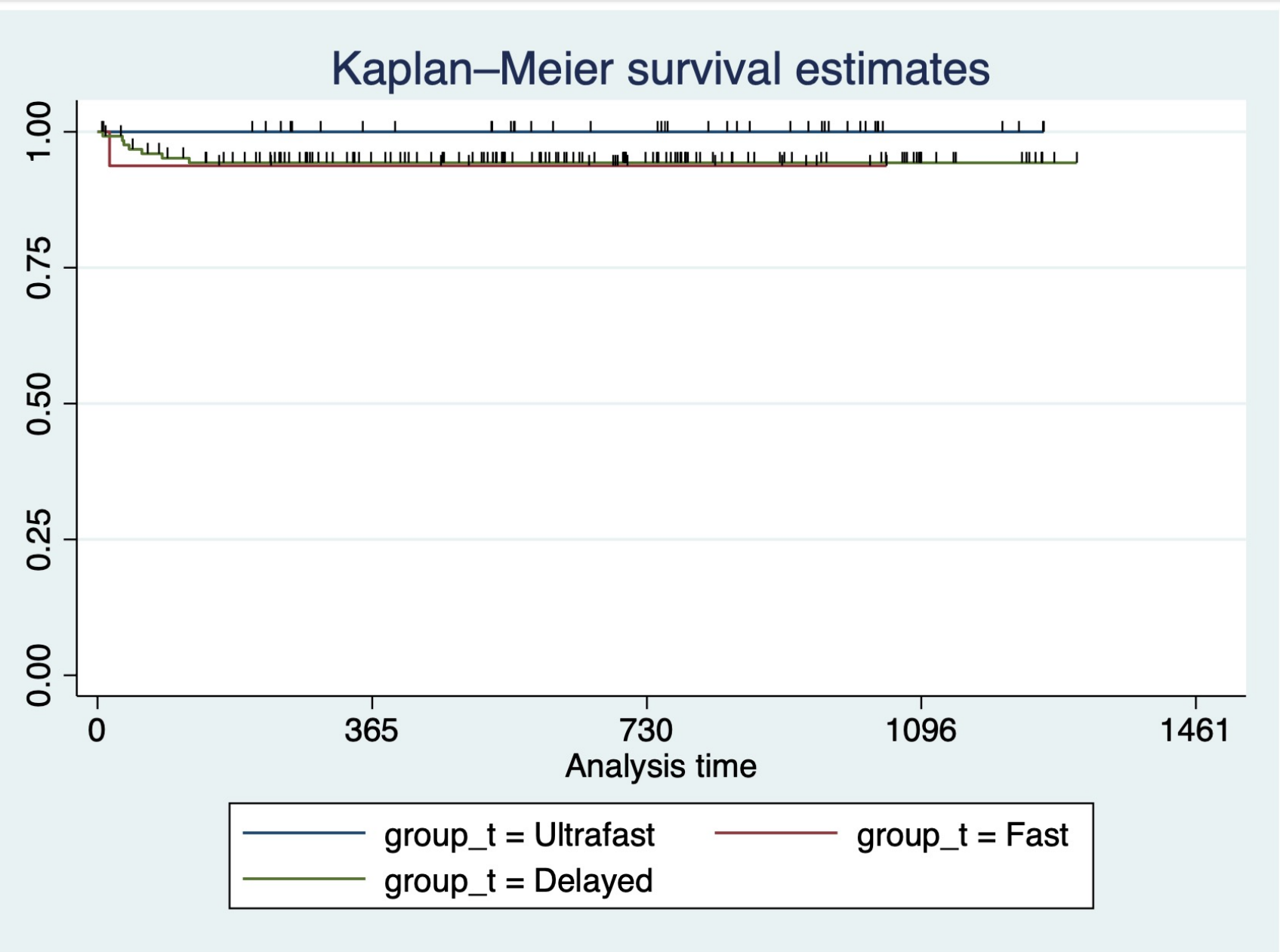


Figure 3 survival curve for the 3 groups

Discussion:

In this study we demonstrated that relatively simple post-operative ultrafast or fast extubation were associated with dramatically better performance, less hospital stay and less blood transfusion. Also, there are significant variables decreasing the odds of early extubation, including age, sex, renal function, and surgical status should be considered. In our study the mean age were 49 years old majority were female 66% and yet there is a significant (p = < 0.064) ultrafast vs delayed extubation, no matter the age or sex we still extubate the patients early. Also, we still early extubate high risk patients according to STS score we had significant (p=< 0.001) between ultrafast vs delayed and (p=<0.057) between fast vs delayed with no significant reintubation rate (p=< 1.000). in our study we notice the pulmonary hypertension as a risk factor it is not contraindicated for ultrafast/fast extubation. Atrial fibrillation patients benefit from ultrafast/fast compared to delayed (p=< 1.000) (p=< 0.014) respectively with no increased risk for stroke or bleeding. In one study the ultrafast track extubation protocol have the added benefit of being cost-free, suggesting that implementation of this type of pathway could be universally accomplished ((1), n.d.). Although the benefits of early extubation for all ventilated patients are recognized, few studies provide detailed postoperative protocols outlining how to improve performance ((2), n.d.). Studies that have examined methods of weaning patients from mechanical ventilation have focused on mixed medical and surgical patient populations, but in our study we focused on patients post cardiac surgery. A 1998 study by Micha-lopoulos and colleagues showed that certain anesthesia and sedation regimens could improve early extubation performance after CABG ((1), n.d.). A 2009 study by Sato and colleagues evaluated the effects of a standardized early extubation protocol on 485 on-pump CABG patients and found that early extubation could be performed successfully ((1), n.d.). In each study period, patients extubated early were reintubated at lower rates than overall patients within that period, suggesting that, in fact, we did not expose our patients to an increased risk of reintubation by our more aggressive extubation protocols. Finally, in our study There were different in reduce hospital stay and blood transfusion in ultrafast track extubation compared to prolonged mechanical ventilation.

Conclusion:

In Robotic cardiac surgery patients ultrafast track extubation significantly reduce hospital length of stay. Mortality, readmission to ICU and hospital were to be higher with delayed extubation. Despite the fact there was trend of ICU re-admission and hospital re-admission on the delayed group yet it found that it is not statistically significant due to low sample size.

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