

Concurrent RVAD Improves Survival for Patients with RV Failure at the Time of LVAD Implantation

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BACKGROUND

Right ventricular (RV) failure is associated with poor outcomes after left ventricular assist device (LVAD) placement including significant perioperative mortality and morbidity¹. This can be mitigated with a temporary right ventricular assist device (RVAD), which ideally should be placed before the development of multisystem organ failure. Early planned RVAD placement can reduce the adverse effects associated with RV failure².

METHODS

We retrospectively reviewed our experience from January 2013 to July 2018. Of the 245 patients who underwent continuous flow LVAD implantation, 32 patients (13%) required RVAD placement. Subjects were divided into two groups as concurrent RVAD placement (defined as RVAD at the time of LVAD implantation) versus delayed RVAD placement (defined as an RVAD placed at any time after leaving the operating room for the LVAD implant). Survival, ICU and total length of stay (LOS), and total number of days on RVAD were compared utilizing Chi-square and two tailed t-test.

Table 1. Demographic and Clinical Characteristics

Characteristic	Concurrent (n=19)	Delayed (n=13)	p-value
Age (yrs) – mean ± SD	50.4 ± 17.1	57.8 ± 13.1	0.2
Male – n (%)	16 (84.2)	10 (76.9)	-
Female – n (%)	3 (15.8)	3 (23.1)	-
Caucasian – n (%)	13 (68.4)	10 (76.9)	-
African American – n (%)	6 (31.6)	2 (15.4)	-
Native American – n (%)	0 (0)	1 (7.7)	-
HeartMate II – n (%)	15 (78.9)	11 (84.6)	-
HeartMate 3 – n (%)	4 (21.1)	2 (15.4)	-
CVP (mmHg) – mean ± SD	13.7 ± 6.5	9.5 ± 3	0.037

RESULTS

Patients in the concurrent RVAD group (n=19) had higher preoperative central venous pressure (CVP) when compared to delayed RVAD group (n=13, $p = 0.037$). Survival rate at three months ($\chi^2 = 6.647$, $p 0.010$) and one year ($\chi^2 = 3.983$, $p 0.046$) was significantly better among patients who received concurrent LVAD. Mortality was based on all 32 patients who received RVAD implant and Chi-square was used to assess the difference between the two groups. The overall survival rate was based on the Kaplan-Meier estimates and the Log-Rank test was used to compare the survival curves of the two RVAD groups. ICU LOS, total hospital LOS, and number of days on RVAD were not statistically significant between the two groups.

RESULTS

Figure 1. Three Month Survival Cure

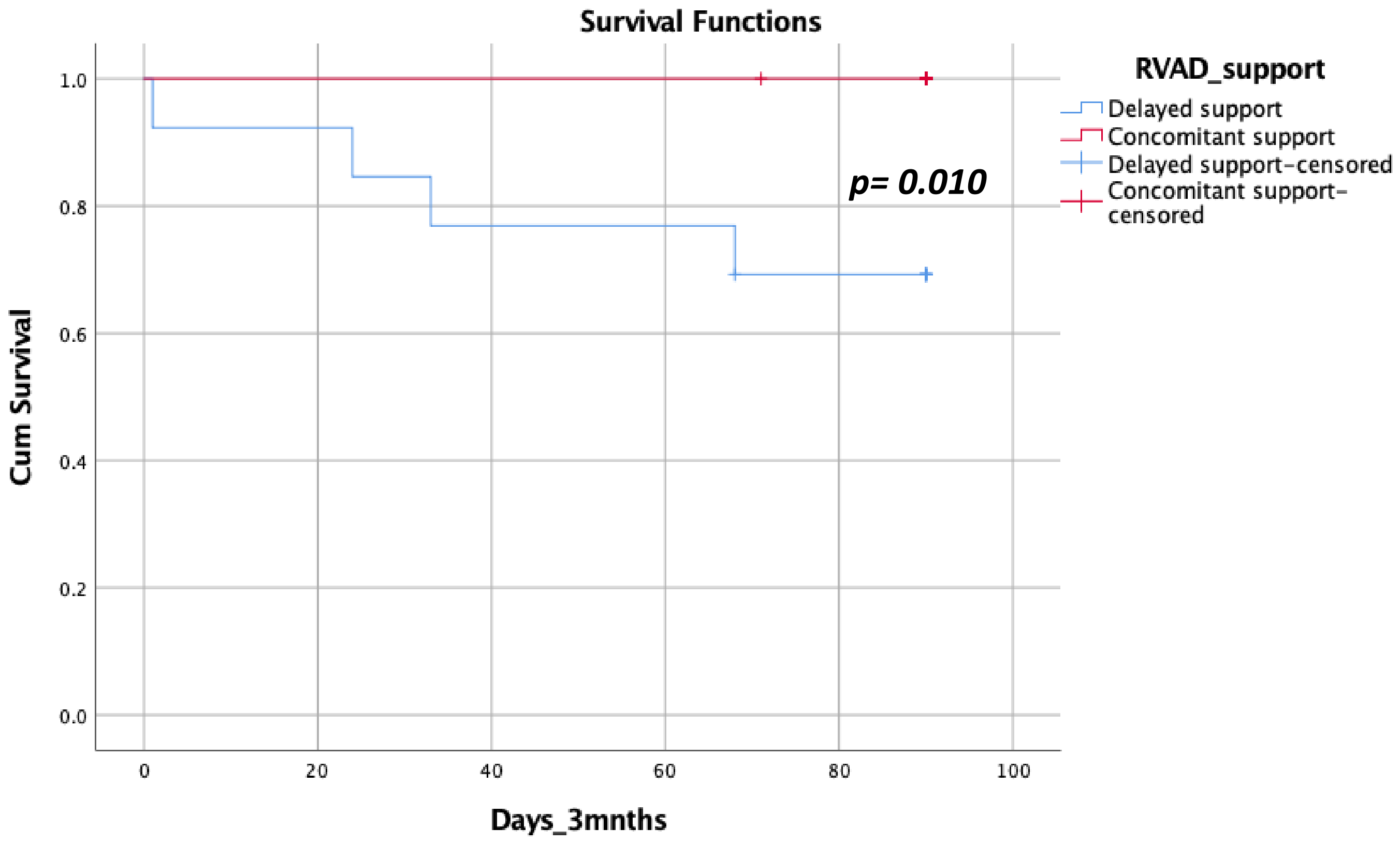


Figure 2. One Year Survival Cure

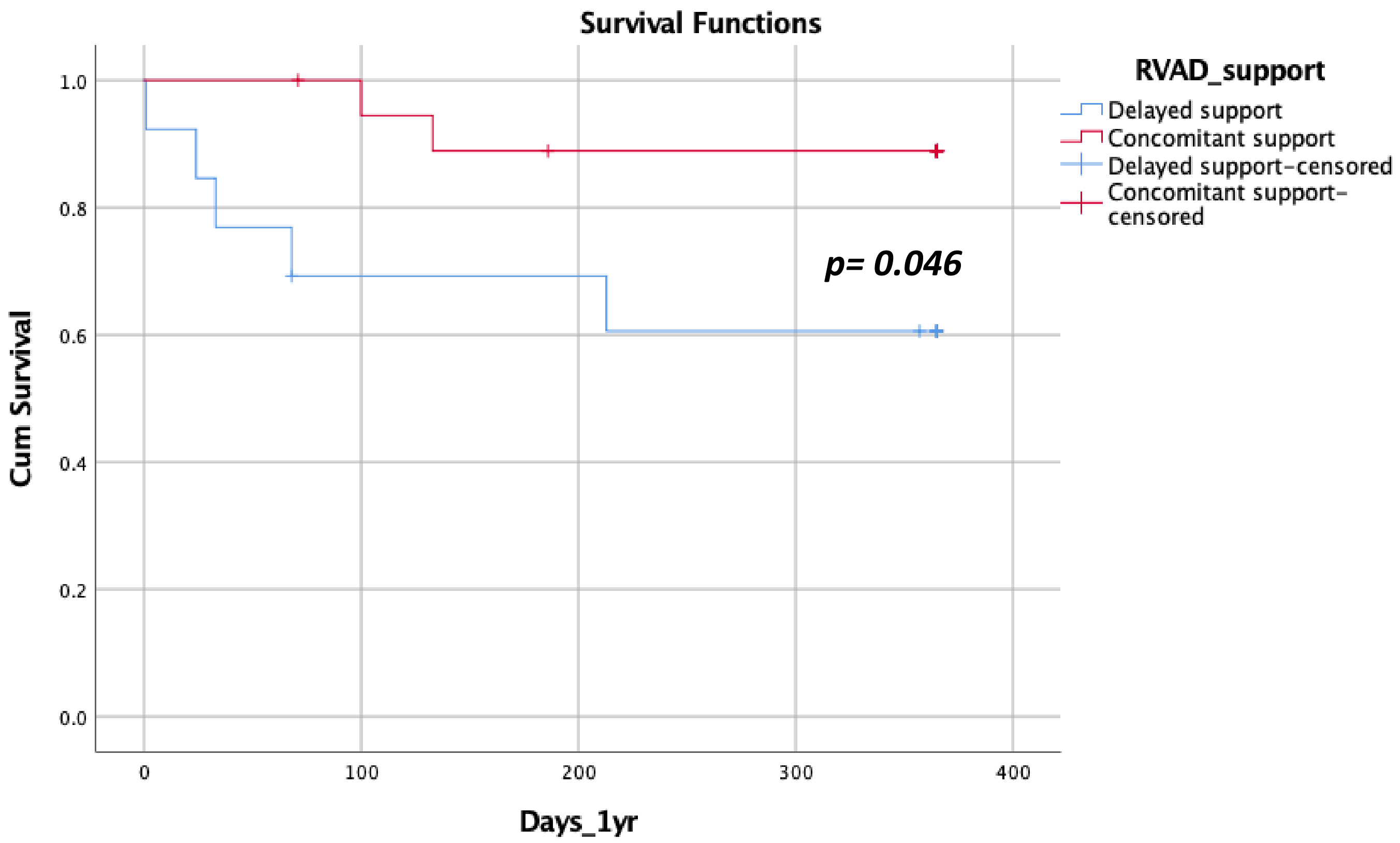


Table 2. Outcome Comparison

Days (mean ± SD)	Concurrent	Delayed	p-value
ICU length of stay	26.5 ± 20.9	22.5 ± 13.5	0.542
Hospital length of stay	51.8 ± 21.3	48.2 ± 21.3	0.634
RVAD support	19.7 ± 18.8	16.5 ± 11.3	0.578

CONCLUSIONS

In our population, concurrent placement of a temporary RVAD for patients with RV failure at the time of LVAD implantation improves short- and long-term survival post LVAD implantation as compared to a delayed RVAD approach.

REFERENCES

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DISCLOSURE

The authors have not used any off label or unapproved product. The authors have no financial or professional affiliations to disclose related or derived from the information in this research.