Characterization of Postoperative Atrial Fibrillation After Continuous Flow Left Ventricular Assist Device Implant as Destination Therapy

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Background

- Continuous flow left ventricular assist devices (CF-LVADs) have been increasingly used as destination therapy (DT).
- While modern devices have been associated with decreased stroke risk, postoperative atrial fibrillation (POAF) remains a common complication following cardiac surgery and is associated with numerous complications.
- The purpose of this study was to characterize POAF in relation to stroke burden in a modern institutional cohort of CF-LVAD patients with DT indication.

Methods

- Patients implanted with CF-LVAD as DT at our center from June 2010-June 2020 were retrospectively reviewed using our institutional STS and INTERMACS databases and chart review of our electronic medical records (n=304).
- Stroke was defined as any confirmed neurological deficit caused by abrupt disruption in cerebral blood flow that did not resolve within 24 hours and was confirmed by imaging.
- A competing risks model to account for death during follow-up was applied to evaluate stroke outcomes. Fine-Gray regression was used to evaluate thirty-five covariates.

Results

Results:
Patients implanted with CF-LVAD (n=304) were classified by HeartMate II (n=190), HeartMate III (n=72), and HVAD (n=42) device type.

Preoperatively, 45% (138/304) of patients had a history of AF. Following CF-LVAD implant, 37% (111/304) developed POAF.

Estimated stroke incidence was 15%, 24%, and 26% at 1, 3, and 5 years, respectively. Stroke was categorized as either hemorrhagic (39/70; 56%) or embolic (31/70; 44%).

Competing Risks Regression:
On multivariable Fine-Gray regression, HeartMate III (SHR 0.39 (0.18, 0.86), *P*=0.020) and amiodarone were associated with lower stroke risk (SHR 0.52 (0.30, 0.91), *P*=0.021); POAF was associated with increased stroke risk (SHR 1.65 (1.01, 2.71), *P*=0.047), while preoperative AF was not significant (*P*=0.250).

	Overall N=304	HeartMate II N=190	HeartMate III N=72	HVAD N=42
Preoperative				
Age (yr)	61±12	61±11	62±13	55±14
Atrial Fibrillation	138 (45%)	78 (41%)	36 (50%)	24 (57%)
Prior stroke	33 (11%)	21 (11%)	11 (15%)	1 (2%)
Male	240 (79%)	143 (75%)	65 (90%)	32 (76%)
BMI (kg/m^2)	28.4±6.3	28.4±6.5	27.5±5.5	30.0±6.7
Postoperative				
Late Stroke	70 (23%)	57 (30%)	7 (10%)	6 (14%)
Atrial Tachyarrhythmia	111 (37%)	67 (36%)	29 (40%)	14 (33%)
Amiodarone at Discharge	115 (38%)	63 (33%)	32 (44%)	20 (48%)
Beta Blocker at Discharge	124 (41%)	73 (38%)	31 (43%)	20 (48%)

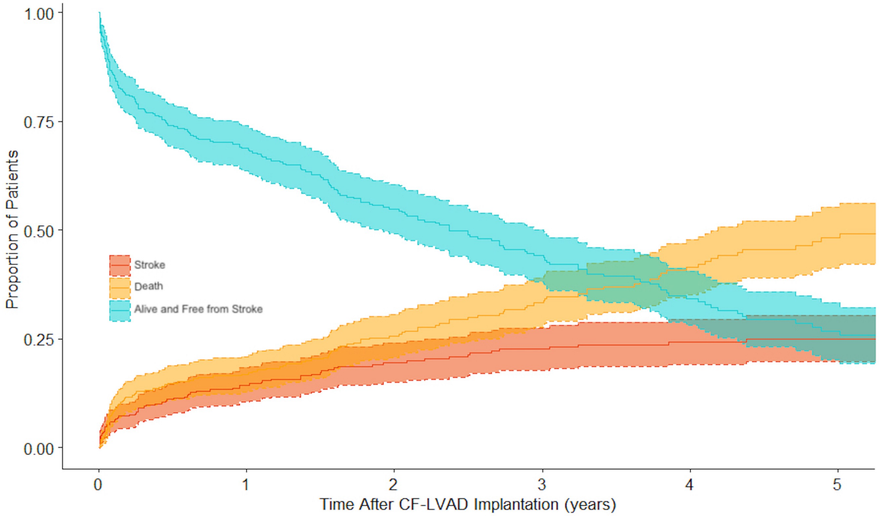


Figure: Competing risks of death and stroke after implant of CF-LVAD for destination therapy. Terminal events were represented by cumulative incidence functions. The probability of remaining alive and free from stroke was represented as a Kaplan-Meier composite endpoint.

Conclusions

POAF following CF-LVAD implant was associated with late stroke, while amiodarone at discharge appeared to have a protective effect. The use of HeartMate III was associated with decreased stroke rates, but risk remained high in patients who developed POAF. Further investigation is warranted on protective strategies and therapeutic use of amiodarone for POAF after CF-LVAD implantation.

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