**Abstract:** 864

A modified snare technique improves left ventricular lead implant success and response rate to cardiac resynchronization therapy

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Introduction:

Left ventricular (LV) lead placement is often the most challenging aspect of cardiac resynchronization therapy (CRT) device implantation, with a failure rate up to 10% due to complex coronary anatomies.

Purpose:
To evaluate the efficacy of a modified snare technique in the LV lead implantation in cases of standard technique failure and to evaluate its impact in the response rate to CRT.

Methods:

A prospective study was conducted of patients indicated for a CRT implant. When LV lead delivery to the target vessel failed using standard techniques, a modified snare technique was implemented, using a secondary coronary sinus delivery sheath introduced through the same venous puncture. Patients were evaluated every 6 months. Efficacy was quantified by long-term surgical intervention rates. Patients were evaluated with transthoracic echocardiography before CRT implant and between 6-12 months post-implant. Patients with ejection fraction (EF) elevation = 10% or LV end-systolic volume (ESV) reduction = 15% were classified as responders. Patients with EF elevation = 20% or LV ESV reduction = 30% were classified as super-responders. Time to surgical revision and mortality were evaluated by the Cox regression and Kaplan-Meier methods.

Results:

From 2015-2019, 566 CRTs were implanted (26.1% female, 72±10.2 years old, follow-up duration 18.9±15.8 months). The standard LV implant technique failed in 94 cases (16.6%), of which the modified snare technique was successful in 92 (97.9%) with LV lead implant in a lateral vein in 94.7% of cases. Baseline clinical characteristics were similar between patients who implanted LV lead with snare vs standard technique (p=NS). The 4-year surgical intervention rate was lower with the modified snare implant technique than with the standard technique (3.2% vs. 10.2%, HR 0.26, 95% CI 0.08-0.84, p<0.05), with a relative risk reduction of 74% and a number needed to treat to prevent one surgical intervention of 14. The intervention rate was also lower regarding LV lead implant failure or dislodgement rates (0% vs. 5.3%, p<0.05). Major complications were similar between groups.

In addition, the response rate to CRT was higher in the modified snare technique than in the standard approach (71.1% vs 55.0%, p<0.05). In patients who implanted the LV lead with the snare technique, EF increased from 28.1 ± 8.2% to 36.1 ± 11.1% (p<0.05) and LV ESV decreased from 127.8 ± 64.0mL to 99.8 ± 61.1mL (p=0.01).
The super-response rate was similar between groups (33.3% vs 27.8%, p=NS).

Conclusion:

For challenging coronary sinus anatomies that preclude LV lead placement by standard methods, this modified snare alternative was effective, with significantly lower surgical intervention rates and a higher response rate to resynchronization therapy. This higher than expected response rate with the snare technique, evaluated by remodeling criteria, may be explained by the implant of LV lead in the desired target lateral vein.