# Durability Of Right Greater Splanchnic Nerve Ablation For The Treatment Of Heart Failure with Preserved Ejection Fraction in an Open-label First-in-human Clinical Trial

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# Background: Splanchnic Ablation for Volume Management

- In HFpEF, increased sympathetic outflow to the splanchnic venous system causes chronic redistribution of blood volume into the central circulation, which leads to exercise limitations, hemodynamic deterioration, and poor outcomes.
- We propose a treatment paradigm called splanchnic ablation for volume management (SAVM) to improve handling of volume shifts and clinical outcomes in patients with HF [1].
- We previously demonstrated the benefits of permanent right-sided greater splanchnic nerve (GSN) ablation using a thoracoscopic approach [2]. Here we report the 12-month results using a minimally invasive endovascular technique.

## Objectives

• To demonstrate durability of a novel transvenous approach to right-sided GSN ablation for the treatment of HFpEF.

#### Methods

- Open-label trial [3], of HF patients with NYHA class II or III symptoms, LVEF ≥ 50%, and elevated PCWP at rest or with exercise.
- All patients underwent SAVM by endovascular right GSN ablation using the Satera Ablation System (Axon Therapies).
- Follow-up assessments included 6MWT, KCCQ, physical exam, laboratory testing, and echocardiography.
- Change from baseline ablation to each follow-up were compared using paired Wilcoxon signed rank test; 6MWT was evaluated with paired t-test. Data shown as mean ± standard deviation, unless otherwise noted.

# Methods (continued)

- The Satera<sup>™</sup> Ablation System is an implant-free, transvenous, HF intervention that unilaterally ablates the right-sided GSN.
- Right femoral vein access  $\rightarrow$  IVC  $\rightarrow$  azygous vein  $\rightarrow$  intercostal veins at T10 and T11 accessed, followed by RF ablation.

#### Results

- N=11 HFpEF patients (8 female, age 70±8 years) were enrolled.
- There were no device related adverse cardiac events effects and no expected or unexpected clinical sequalae due to absence of the right GSN.
- Follow-up results (Figures and Table) demonstrate improvements in quality of life (NYHA and KCCQ), exercise capacity (6MWT), and HF severity (NTproBNP) that were apparent as early as 1-month after the index procedure and sustained through the 12-month visit. \* p<0.05, † p<0.01</li>



Parameter	Baseline (n=11)	1 Month (n=11)	3 Months (n=11)	6 Months (n=11)	12 Months (n=8)
NYHA Class	$2.5 \pm 0.5$	$2.0 \pm 0.0^{*}$	$1.9 \pm 0.3^{\dagger}$	$1.5\pm0.5^{\dagger}$	1.8 ± 0.5*
KCCQ Overall Summary Score	43 ± 16	$65 \pm 14^{\dagger}$	79 ± 11†	85 ± 10†	$80\pm9^{\dagger}$
6MWT Distance (m)	292 ± 82	$341 \pm 88^{\dagger}$	$347 \pm 84^{\dagger}$	353 ± 81†	$359 \pm 75^{++}$
NTproBNP (pg/mL) Median [IQR]	865 [639-1170]	1189 [550-1368]	652 [297-904]*	421 [307-639]*	394 [235-484]*

# Conclusions

- These results demonstrate the durability of SAVM to treat HFpEF using the Satera Ablation System.
- An RCT (REBALANCE-HF) is currently underway to validate these results.

# **Future Directions**

- The REBALANCE-HF trial [4] is a prospective, multicenter, randomized, sham-controlled, doubleblind study enrolling 80 patients at up to 20 sites.
- The study objective is to assess safety and effectiveness in HFpEF patients against a control.
- Subjects will be randomized 1:1 to either ablation of the GSN using the Satera<sup>™</sup> Ablation System (treatment cohort) or sham (control cohort) at the time of the procedure and followed 12 months post index procedure.
- Primary endpoint is PCWP at rest and with exercise at 1 month.

## References

- 1 Fudim M, et al. Splanchnic nerve modulation in heart failure: mechanistic overview, initial clinical experience, and safety considerations. Eur J Heart Fail. 2021;23(7):1076-1084
- 2 Málek F, et al. Surgical ablation of the right greater splanchnic nerve for the treatment of heart failure with preserved ejection fraction: first-in-human clinical trial. Eur J Heart Fail. 2021;23(7):1134-1143. 3 NCT04287946
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