Supplementary data

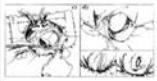
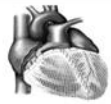
Supplementary Table 1. The CORCINCH-HF and ALIVE clinical trials.

	CORCINCH-HF	**ALIVE**
Study design	Multi-center prospective randomized trial	Multi-center prospective non-randomized trial
Device	AccuCinch® Ventricular Repair System	Revivent TC System
No of subjects	400 (1:1 randomization to device vs GDMT)	126 (2:1 allocation to device vs GDMT)
Key inclusion criteria	1. LVEF 20-40% and LVEDD >55mm 3. NYHA II-IV (ambulatory) 4. Able to complete 6MWT distance 100-450m 5. On optimal GDMT and CRT (if indicated) for at least 90 days	1. LVEF <45% and LVESVi >50mL/m^2 2. NYHA III-IV (ambulatory) on GDMT 3. Contiguous acontractile scar or aneurysm involving the septum, anterior, apical or anterolateral LV wall 4. Viable myocardium remote from scar area
Key Exclusion Criteria	1. MI, PCI or CT surgery within 90 days 2. Untreated significant CAD 3. Severe aortic arch calcification, mobile aortic atheroma, intracardiac mass, thrombus or vegetation 4. Suboptimal ventricular anatomy 5. MR grade ⩾3 or degenerative MR 6. Prior mitral or aortic valve replacement 7. Planned CT surgery in the next 6 months 8. Non-ambulatory NYHA IV 9. Severe RV dysfunction by RHC and TTE	1. MI within 90 days 2. Intracardiac thrombus or mass 3. Secondary MR greater than moderate (EROA>20mm^2) or degenerative MR 4. Need for coronary revascularization 5. CRT device within 60 days 6. PASP >60mmHg 7. Serum Cr >2.5mg/dl, eGFR <30ml/min 8. Contraindication to anticoagulation 9. CVA or TIA within 6 months

	10. PASP > 70mmHg 11. Severe TR (grade ⩾3) 12. Moderate or severe AS or AR 13. HOCM, amyloid, restrictive cardiomyopathy, constrictive pericarditis 14. eGFR<25 ml/min/1.73m^2 15. Stroke within 90 days 16. Contraindication to anticoagulation 17. Life expectancy < 1 year due to noncardiac conditions	10. Previous open-heart surgery, thoracotomy or pericardiotomy 11. Life expectancy <1 year due noncardiac conditions
Follow-up	5 years	5 years
Endpoints	1. Freedom from device related MAEs at 180 and 365 days (all-cause death, MI, stroke, non-elective cardiac surgery, worsening HF requiring mechanical support for ≥24 hours) 2. Change in KCCQ Score 3. Change in 6MWT distance 4. Composite of all-cause death, LVAD implant or heart transplant, HF hospitalizations, change in KCCQ score	1. All-cause death, mechanical support, emergent cardiac surgery, prolonged mechanical ventilation, renal failure and stroke at 30 days 2. All-cause death, mechanical support, operation for HF, bleeding or tamponade at 1-12 months 3. HF hospitalizations and improvement in HF symptoms (NYHA class, MLHF quality of life score, 6MWT)

Table abbreviations

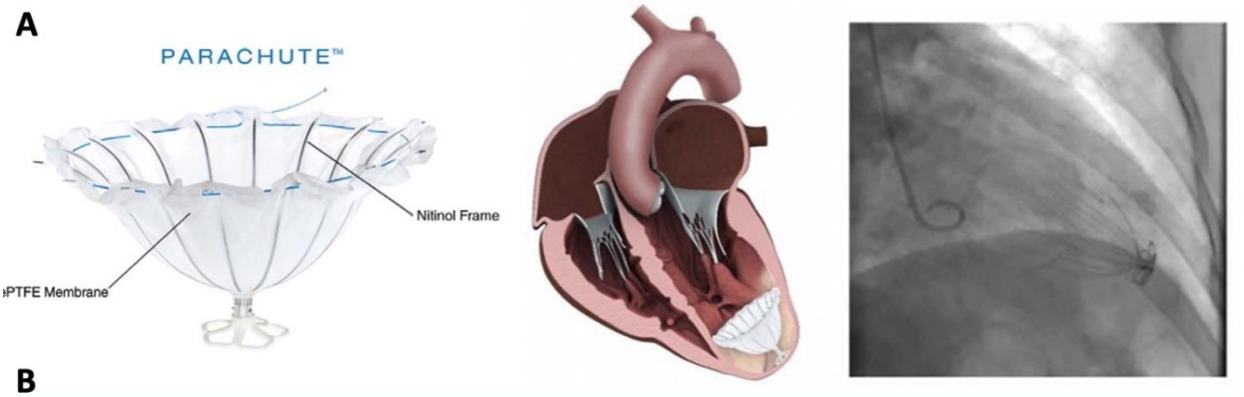
AR: aortic regurgitation, AS: aortic stenosis, CVA: cerebrovascular accident, eGFR: estimated glomerular filtration rate, HOCM: hypertrophic obstructive cardiomyopathy, KCCQ: Kansas City Cardiomyopathy Questionnaire, MAE: major adverse events, PASP: pulmonary artery systolic pressure, RHC: right heart catheterization, TIA: transient ischemic attack, TR: tricuspid regurgitation.

	Procedure and Study Design	Baseline Data		Follow-up Data	
	**Dor procedure** (endoventricular circular patch) Prospective, observational, single center study of 207 patients with prior anterior MI complicated by aneurysm	EF (%): 35 ± 13 EDVI (ml/m²): 166 ± 77 ESVI (ml/m²) 112 ± 64 Inducible VT (n): 75/163		Mean 39 ±19 months EF (%): 48 ± 12 EDVI (ml/m²): 86 ± 34 ESVI (ml/m²): 46 ± 26 Inducible VT (n): 13/182 Mortality (%): 14.5 (does not include operative mortality)	
	**Modified Dor procedure** STICH 2 Trial : multicenter, international, RCT of 1000 patients with LVEF ≤ 35%, CAD amenable to CABG, and anterior LV scar/aneurysm amenable to SVR. Randomized to SVR + CABG vs CABG alone. Primary outcome: death from any cause or hospitalization for cardiac cause	CABG EF (%): 28 (23-31) ESVI (ml/m²): 82 (65-102) MR: 35% trace/none, 47% mild, 14% moderate, 3% severe 6MWT (m): 350	CABG + SVR EF (%): 28 (24-31) ESVI (ml/m²): 82 (66-105) MR: 38% trace/none, 43% mild, 14% moderate, 4% severe 6MWT (m): 350	Median 48 months (control vs treatment) Primary outcome: 59% vs 58% p = 0.90. HR 0.99 (0.84-1.17) All cause mortality: 28% vs 28% p = 0.98 HR 1 (0.79-1.26) Average improvement in NYHA class: 1 in both groups (p = 0.7) Average improvement in CCS class: 1.7 in both groups (p = 0.84) 6MWT (m): 350 for CABG and 420 for CABG + SVR (p = 0.8)	
	**Myosplint** (tension filament) 21 patients with idiopathic dilated cardiomyopathy, NYHA class III/IV, LVEF ≤ 35%, LVEDd 6.5-12cm underwent Myosplint + mitral valve repair or Myosplint alone	Myosplint NHYA 2.9 ± 0.4 LVEDV (ml): 320 ± 143 LVESV (ml): 265 ± 119 LVEF (%): 17.1 ± 4 MR (grade): 1.6 ± 0.6	Myosplint & MVr NHYA 3.0 ± 0.2 LVEDV (ml): 339 ± 149 LVESV (ml): 263 ± 128 LVEF (%): 24.4 ± 9.6 MR (grade): 2.8 ± 0.9	Myosplint at 6 months NHYA 2.1 ± 0.9 LVEDV (ml): 296 ± 170 LVESV (ml): 233 ± 150 LVEF (%): 23.1 ± 7.2 MR (grade): 1.6 ± 1.1	Myosplint & MVr at 6 months NHYA 2.1 ± 0.6 LVEDV (ml): 337 ± 150 LVESV (ml): 273 ± 141 LVEF (%): 21.1 ± 6.4 MR (grade): 1.3 ± 1.1
	**Coapsys** (tension filament) RESTOR-MV: Prospective, multicenter, RCT of 300 patients undergoing CABG with LVEF ≥ 25% and at least moderate MR. Randomized to CABG + MVr (ring annuloplasty or Coapsys) vs CABG (CABG or CABG with Coapsys). Primary outcome: all-cause mortality, primary adverse events, decrease in MR	CABG + MVr (control = 75) LVEF: 38.3 ± 10.3 MR: 2.54 ± 0.804 NYHA: I (7%), II (41%), III (48%) CABG + Coapsys (treatment = 74) LVEF: 35.4 ± 10 MR: 2.4 ± 0.8 NYHA: I (5%), II (41%), III (51%)	CABG (control = 8) LVEF: 35 ± 8.7 MR: 2.0 ± 0.6 NYHA: I(0%), II(25%), III(62%) CABG + Coapsys (treatment= 8) LVEF: 39.2 ± 5.8 MR: 2.0 ± 0.6 NYHA:I (13%), II (62%), III (25%)	24 months Survival (all patients): 77% (control) vs 87% (Coapsys) HR 0.421. p = 0.038 Complication-free survival (all patients): 63% (control) & 76% (treatment) HR 0.372. p = 0.022	MR Grade (24 months) CABG + MVr: 0.35 ± 0.63 CABG + Coapsys: 1.24 ± 0.97 (p < 0.0001) CABG: 1.33 ± 0.58 CABG + Coapsys: 1.29 ± 0.76 CABG + MVr improvement NYHA class ≥ 1 1 year: 66% (control) vs 71% (treatment). 2 year: 72%(control) vs 79% (treatment) for time p = < 0.001, between groups p = 0.86
	**CorCap** (left ventricular polyester mesh) Acorn : Prospective, multicenter, RCT of 300 patients with symptomatic HF (NYHA III-IV), LVEF ≤ 35%, LVEDd ≥ 60mm or LVEDI ≥ 30, and 6MWT < 450m on optimal GDMT. Stratified by need for MVR vs no MVR. Compared Corcap + MVR vs MVR alone and Corcap + GDMT vs GDMT alone. Primary endpoint: composite of survival, the need for major cardiac procedures for worsening heart failure, and a change in NYHA class	Control LVEF: 27% ± 8 LVEDd 72.5 ± 10.2 LVEDV 204 ± 100 LVESV 204 ± 100 MR: 2.0 ± 1.4 MLHF: 60 ± 23.2 Peak VO2: 15.5 ± 4.6 NYHA: II 15%, III 80%, IV 5%	Treatment LVEF (%): 26 ± 9 LVEDd (mm): 71.7 ± 10.2 LVEDV (ml): 271 ± 108 LVESV: 203 ± 96.8 MR (grade): 2.0 ± 1.5 MLHF: 60.6 ± 21.7 Peak VO2: 13.8 ± 3.9 NYHA: II 15%, III 82%, IV 3%	Median 22.9 months (control vs treatment) Primary endpoint 27% vs 38% HR 1.73 CI 1.07-2.79 p= 0.024 Mortality: 16.4% vs 16.8% p = 0.8 Freedom from major cardiac procedures: 74% vs 89% p = 0.01 Improvement in NYHA ≥ 1 class: 36% vs 45% p = 0.049 Serious adverse events 1 year: 78% vs 81% p = 0.43 Treatment effect LVEF: 3.8% p 0.45, LVESV: -15.6ml p 0.013, LVEDV: -18.8ml p 0.005	
	**HeartNet** (circumferential nitinol epicardial mess that covers LV and RV) PEERLESS-HF: Multicenter RCT of 200 patients with symptomatic HF, EF ≤ 35% despite GDMT, 6MWD 150-450 m, peak VO2 10-20 ml/kg/min, LVEDD < 85mm, LVEDDi < 40 mm/m², and HF duration > 6 months.	Control NYHA II 51% NYHA III 50%	Treatment NYHA II 51% NYHA III 45%	6 months (control vs treatment) Peak VO2: improvement frequency 39% vs 37% (p=0.5) MLQHF: improvement frequency: 49% vs 37% (p =0.184) 6MWT: improvement frequency: 25% vs 38% (p=0.044) NYHA improvement at 6 months: 29 patients vs 37 patients (p = 0.52) KCCQ mean change at 6 months: 3.4 vs 12.6 (p= < 0.001)	

Supplementary Figure 1. **Surgical ventricular restoration procedures and relevant studies[21,22,24-29].**

CABG: coronary artery bypass grafting, CCS: Canadian Cardiovascular Society, FMR: functional mitral regurgitation, HR: hazard ratio, KCCQ: Kansas City Cardiomyopathy Questionnaire, MLHF: Minnesota Living with Heart Failure, MVr: mitral valve repair, RCT: randomized-controlled trial, SVR: surgical ventricular restoration, VO2: oxygen consumption, 6MWT: 6-minute walk test

A



B

	Baseline	6 mo	12 mo	24 mo	36 mo
LVEDVI (ml/m^2)	125.7 (3.04)	109.4 (3.04)	108.9 (3.04)	108.9 (3.04)	114.4 (3.04)
LVESVI (ml/m^2)	89.6 (2.60)	77.1 (2.60)	76.7 (2.60)	76.6 (2.60)	87.0 (2.60)
EF %	28.9 (1.39)	29.7 (1.39)	30.0 (1.39)	30.0 (1.39)	27.0 (1.39)

Supplementary Figure 2. **The Parachute left ventricular partitioning device.**

A: The Parachute device consists of a self-expanding nitinol frame, a polytetrafluoroethylene (ePTFE) impermeable membrane and an atraumatic polymer foot and is implanted in the left ventricular apex. **B**: 36-month longitudinal echocardiographic data from patients who received the Parachute device.