A NEW THERAPEUTIC CONCEPT: BARIATRIC SURGERY SUPPORTED BY TRANSVALVULAR AXIAL-FLOW PUMPS

Nicolas Brozzi,[1], Rene Aleman,[2], Sinal Patel,[3], Mauricio Velez,[4], Jose Sleiman,[4], Tatiana Jamroz,[5], Jose Luis Navia,[1], Cedric Sheffield,[6], Raul Rosenthal,[7]

[1] Cleveland Clinic Florida; Cleveland Clinic Florida; Cardiothoracic Surgery, [2] Cleveland Clinic Florida; Cleveland Clinic Florida; Ct Surgery, [3] Cleveland Clinic Florida; Ct Surgery, [4] Cleveland Clinic Florida; Cardiology, [5] Cleveland Clinic Blvd; Anesthesia, [6] Cleveland Clinic Blvd; Cleveland Clinic Florida; Cardiothoracic Surgery, [7] Cleveland Clinic Florida; Bariatric Surgery

---

"Double Trouble of Advanced Heart Failure and Morbid Obesity: Application of Trans-Valvular Axial-Flow Pumps in Bariatric Surgery"

Introduction:

Heart failure (HF) affects over 6 million people in the United States (US). Similarly, morbid obesity (BMI>40 kg/m2) affects nearly 10% of the population, and has increased association with HF. Both heart transplantation and bariatric surgery (BaS) are well established procedures for the treatment of advanced HF and obesity, respectively. Nevertheless, cardiac transplant and bariatric therapeutic guidelines consider one pathology as contraindication for surgical treatment of the other. The dual severity of these conditions has resulted in the halt of adequate therapy for the morbidly obese patients with advanced HF. The authors herein present the initial experience with BaS performed under transvalvular axial-flow pump hemodynamic support in patients with decompensated HF.

Methods:

We performed a retrospective review of patients undergoing BaS under Impella support. Basic demographics, type of device, time on support, type of BaS, and surgical outcomes are reported.

Results:

Two patients received BaS while supported with transvalvular axial-flow pump. Both patients were male, with mean age of 29-years, body mass index (BMI) 48.9 kg/m2, with low cardiac index (CI) 1.8 L/min/m2. Sleeve gastrectomy with temporary hemodynamic support was performed on both patients.

The average time and discontinuance of MCS was 3.5 days following insertion. Post-operative length of stay (LOS) was 11 days, average weight loss and BMI at last encounter were 85.5 lbs., and 36.2 kg/m2, respectively. Following discharge and further optimization of HF management, patients were listed for heart transplantation 54 (62 and 47) days later.

Conclusions:

The combined surgical approach employing transvalvular axial-flow pump hemodynamic support during BaS presents as a safe, and effective strategy to facilitate weight loss in morbidly obese patients with advanced heart failure, with the goal of listing them for heart transplantation. Further studies are necessary to confirm these initial observations.

Patients characteristics and clinical outcomes			
	Patient 1	Patient 2	*Overall*
Variable			
Age (years)	26	32	*29*
Gender (M)	M	M	*100%*
Race	Black	White/Hispanic	
BMI at BaS (kg/m2)	52.6	45.2	*48.9*
LVEF (%)	15	20	*17.5*
Cardiac index (L/min/m2)	1.5	1.9	*1.7*
Comorbidities			
HTN	0	0	*0*
T2DM	0	1	*50%*
CAD	0	0	*0*
HF	1	1	*100%*
Stroke	1	0	*50%*
AKI	1	0	*50%*
CKD	0	0	*0*
COVID-19	0	1	*50%*
ASA Score	4	4	*4*
Mechanical ventilation	0	0	*0*
Transvalvular pump type	Impella CP	Impella 5.5	
Time on ECLS (days)	1	6	*3.5*
ECLS-related complications	0	0	*0*
LOS POP (days)	11	11	*11*
OR Time (mins)	73	295 *	*184*
BMI at 30 days POP (kg/m2)	45	43	44
BMI at 60 days post BaS (kg/m2)	34.9	37.4	*36.2*
Latest BMI after BaS (kg/m2)	34.9	37.4	*36.2*
BMI difference (kg/m2)	17.7	7.8	*12.2*
Total weight loss (lbs.)	108	63	85.5
Days to heart transplant listing after bariatric surgery	62	47	*54*
Follow-up (days)	88	76	82

*Simultaneous implant of Impella 5.5 and bariatric surgery