Simultaneous versus Interval Sleeve Gastrectomy on Patients Requiring Left Ventricular Assist Devices as a Bridge to Heart Transplantation

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Disclosures

- Johnson & Johnson - Research

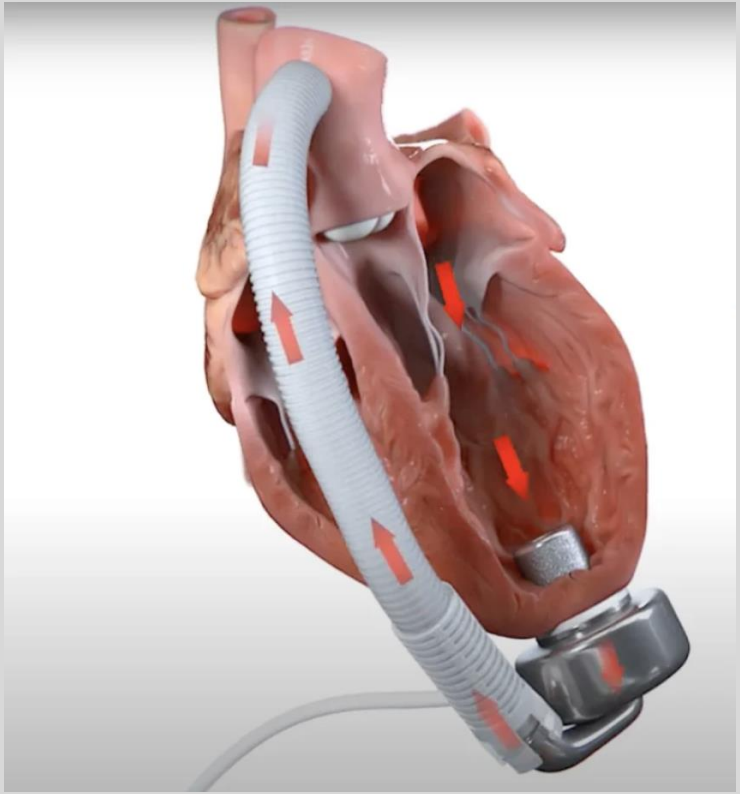
Practice Guideline > J Heart Lung Transplant. 2016 Jan;35(1):1-23.
doi: 10.1016/j.healun.2015.10.023.

The 2016 International Society for Heart Lung Transplantation listing criteria for heart transplantation: A 10-year update

Mandeep R Mehra, Charles E Canter, Margaret M Hannan, Marc J Semigran, Patricia A Uber, David A Baran, Lara Danziger-Isakov, James K Kirklin, Richard Kirk, Sudhir S Kushwaha, Lars H Lund, Luciano Potena, Heather J Ross, David O Taylor, Erik A M Verschuuren, Andreas Zuckermann;
International Society for Heart Lung Transplantation (ISHLT) Infectious Diseases, Pediatric and Heart Failure and Transplantation Councils

Most heart transplant programs exclude patients with obesity (BMI >35 kg/m2)

Left ventricular assist device (LVAD)



Immobility

Limited ability to exercise

Depression

Tex Heart Inst J. 2022 Jan 1;49(1):e207521. doi: 10.14503/THIJ-20-7521.

Left Ventricular Assist Device Support and Longitudinal Sleeve Gastrectomy Combined With Diet in Bridge to Heart Transplant

Mandy Ng [1], Beverly Rodgers [1], Saadiya Rehman [1], Sriram S Nathan [2], Kulvinder S Bajwa [3], Shinil K Shah [3], Bindu H Akkanti [4 5], Marwan F Jumean [2], Sachin Kumar [2], Jennifer L Dressel [1], Rajko Radovancevic [2], Melissa M Felinski [3], Biswajit Kar [2], Igor D Gregoric [2]

Case Reports > J Heart Lung Transplant. 2015 Nov;34(11):1489-91.
doi: 10.1016/j.healun.2015.06.011. Epub 2015 Jul 4.

Simultaneous left ventricular assist device placement and laparoscopic sleeve gastrectomy as a bridge to transplant for morbidly obese patients with severe heart failure

Shinil K Shah [1], Igor D Gregoric [2], Sriram S Nathan [2], Bindu H Akkanti [3], Biswajit Kar [2], Kulvinder S Bajwa [4]; LVAD/Sleeve Gastrectomy Collaborative Group

Objective

Assess the safety of simultaneous sleeve gastrectomy at the time of LVAD placement

Rationale

- Simplify perioperative anticoagulation
- ↓ Time to transplant = ↓ LVAD complications
  - Driveline infections
  - Bleeding
  - Healthcare utilization

Methods

Single center, retrospective cohort study

Population

Inclusion criteria:

- Adult (>18 years old)
- Obesity (BMI ≥ 35 kg/m2)
- End stage heart failure requiring LVAD

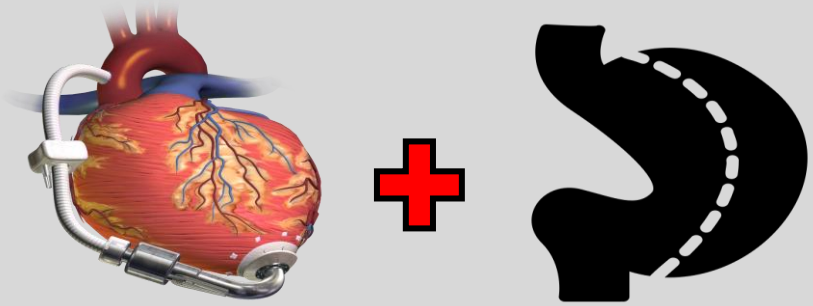
Population

Exclusion criteria:

- Revisional procedures
- Untreated severe psychiatric conditions
- Cirrhosis
- Pregnancy

Intervention and Control

Simultaneous LVAD/SG

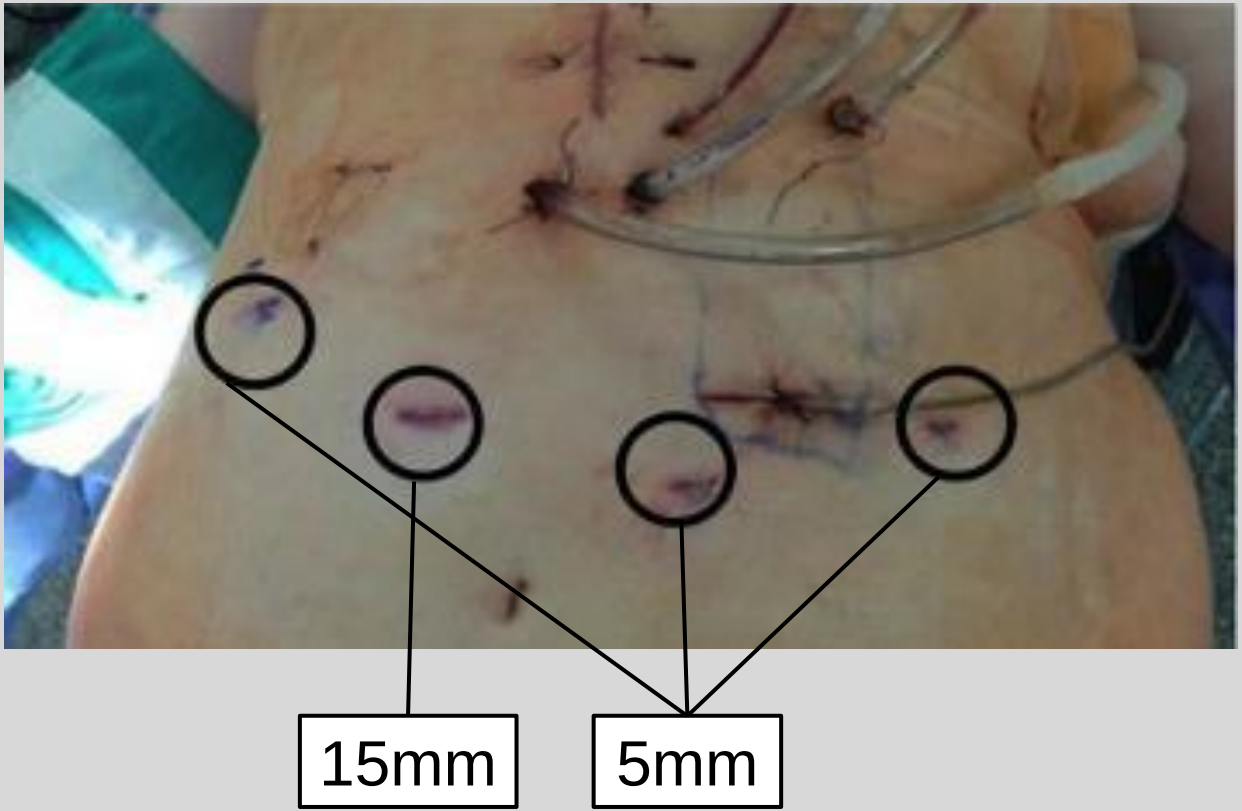


Interval SG

Pre-operative Screening

- Psychological evaluation
- Nutritional labs
- Upper gastrointestinal series / EGD
- Nutritional counseling

Intraoperative Considerations



Post-operative Management

Stage	Duration	Diet
1	Days 1–3	Clear liquids only
2	Days 4–14	Full liquids; includes protein drinks, multivitamin, calcium citrate with vitamin D supplement, 60 g/d protein
3	Weeks 3–6	Puree; includes multivitamin, calcium citrate with vitamin D supplement, 60 g/d protein
4	Week 7 (maintenance)	Solid low-fat, low-carbohydrate; includes multivitamin, calcium citrate with vitamin D supplement, vitamin B12 supplement, 60 g/d protein

Post-operative Management

- Multimodal pain control
- Anticoagulation = 12 - 24 h after surgery
- No routine upper GI series

Primary Outcome

Sleeve related complications at 90 days:

- Post-op bleeding
- Staple line leak
- Intraabdominal abscess
- Death

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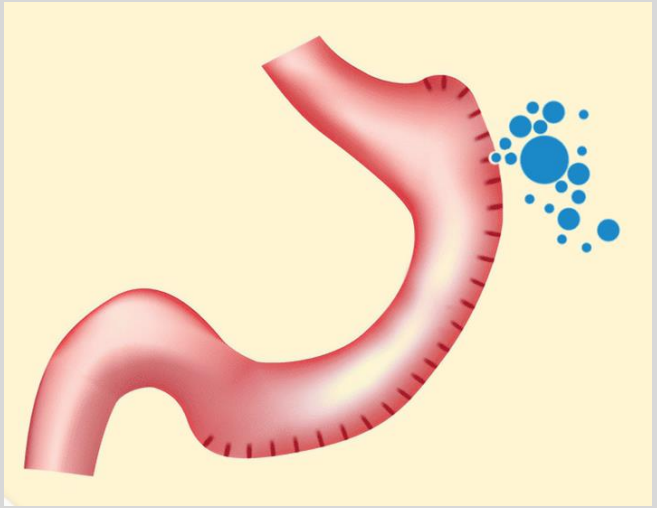

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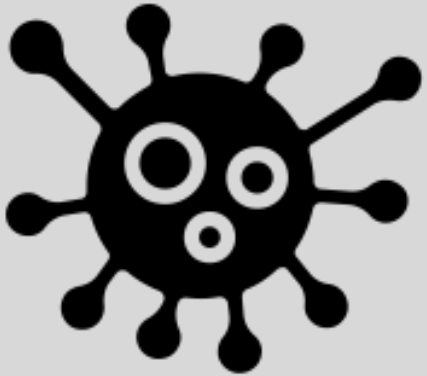


Secondary Outcomes

- Percent of patients with BMI ≤ 35
- Rate of transplantation
- Unplanned readmission
- Unplanned reoperations
- Acute kidney injury (AKI)
- Post-operative transfusions
- Length of stay (LOS)
- Percent excess body weight loss (%EBWL)
- Percent total body weight loss (%TBWL)

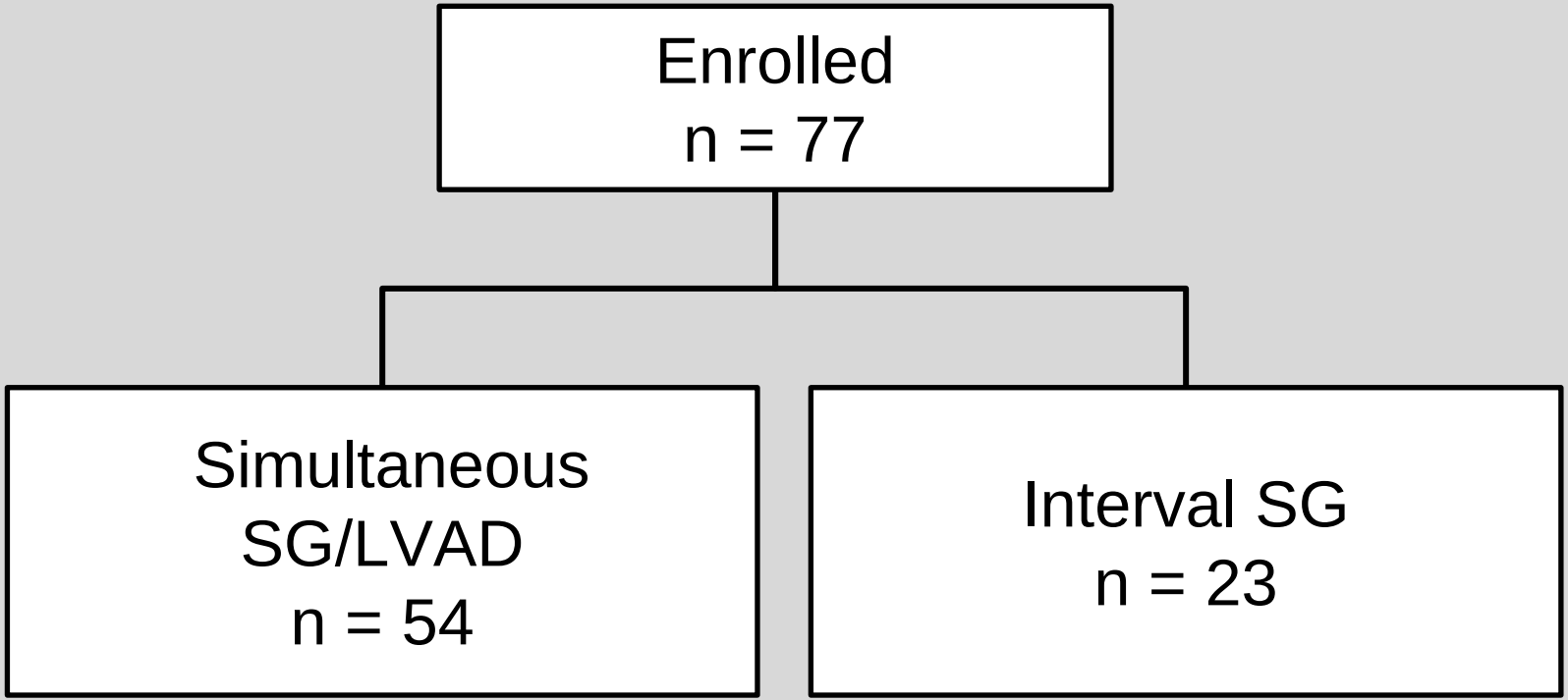
Statistical Analysis Plan

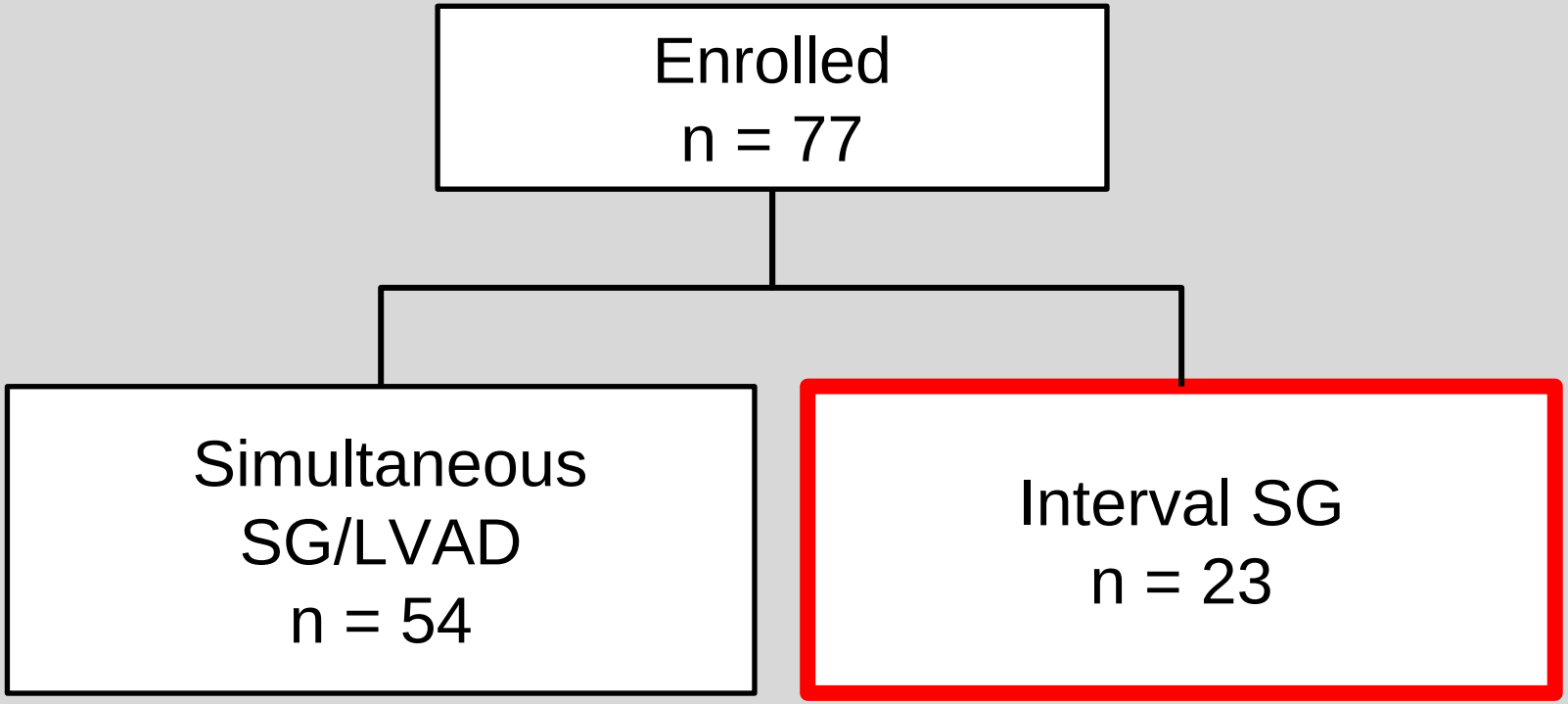
Primary outcome:

- Fisher's exact test

Secondary outcomes:

- Fisher's exact test
- T-test


Enrolled
n = 77
Simultaneous
SG/LVAD
n = 54
Interval SG
n = 23



Time From LVAD -> Sleeve

Median (IQR) = 18 (12.7) months

Baseline Characteristics

	Overall (N=77)	LVAD/SG (N=54)	Interval SG (N=23)	P-value
Age (yrs.), Mean (SD)	44.5 (11.3)	46.3 (11.7)	40.4 (9.6)	0.03
Sex-Male	62%	68%	48%	0.12
ASA Class ≥ 3	100%	100%	100%	1.00

	Overall (N=77)	LVAD/SG (N=54)	Interval SG (N=23)	P-value
Diabetes Mellitus	42%	43%	39%	0.81
HTN	73%	80%	57%	0.05
HLD	39%	46%	22%	0.07
CKD	31%	30%	35%	0.79
CVA	19%	20%	17%	1.00
Arrhythmia	35%	35%	35%	1.00
OSA	40%	46%	26%	0.13
BMI (kg/m^2), Mean (SD)	44.7 (6.5)	45.1 (6.6)	43.8 (6.3)	0.42

	Overall (N=77)	LVAD/SG (N=54)	Interval SG (N=23)	P-value
Cause of heart failure				0.53
Ischemic	18%	20%	13%	
Non-ischemic	82%	80%	87%	
LVEF				0.50
< 20%	56%	59%	48%	
20 - 25%	35%	30%	48%	
25 - 30%	6%	7%	4%	
> 30%	3%	4%	0%	
Pulmonary HTN	30%	35%	17%	0.17

Primary Outcome

	LVAD/SG (N=54)	Interval SG (N=23)	OR (95% CI)	P-Value
SG complications (90d)	7.4%	17.4%	0.38 (0.09-1.67)	0.23

Simultaneous LVAD/SG

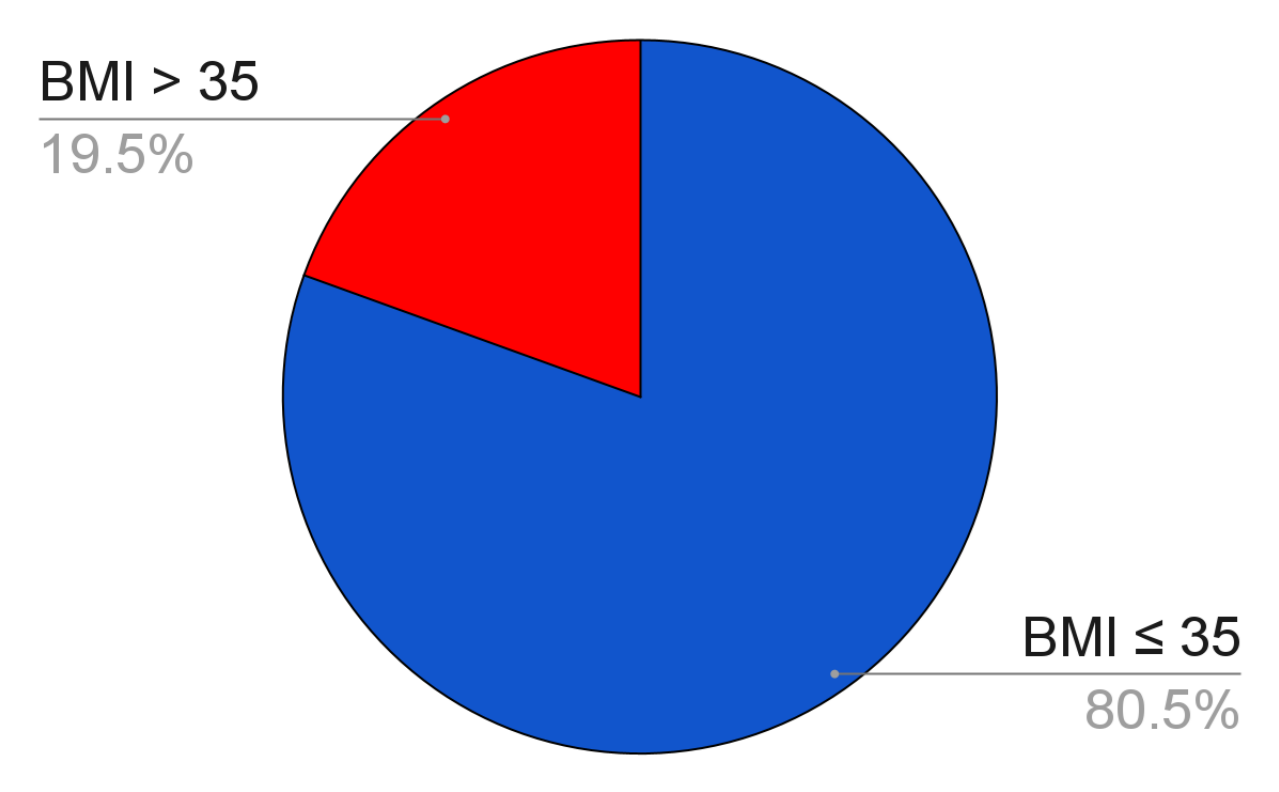
X 3

X 1

Interval SG

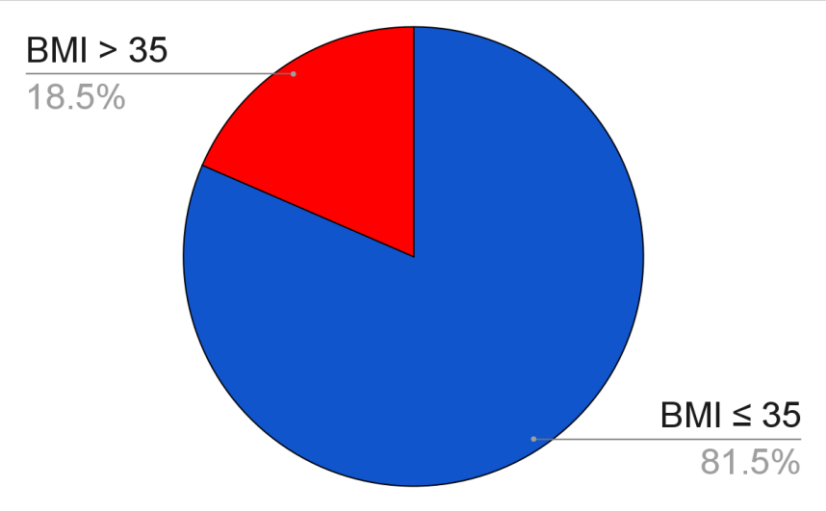
X 4

BMI ≤ 35

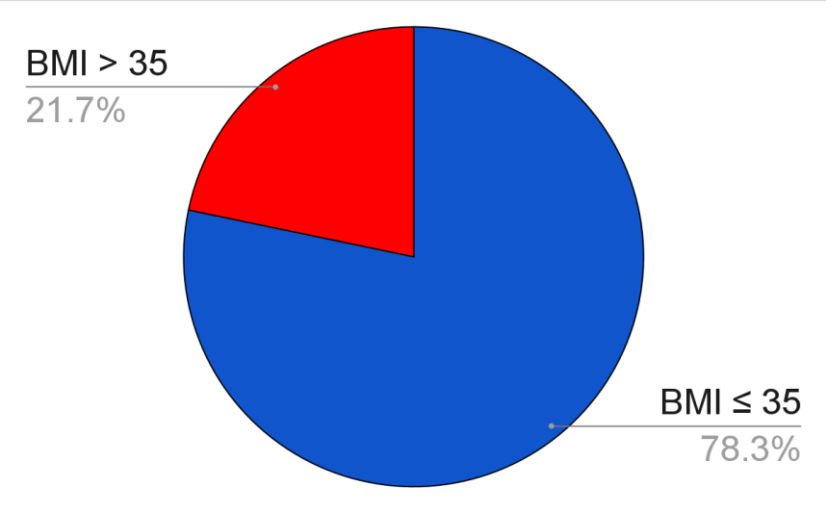


BMI ≤ 35

Simultaneous SG/LVAD

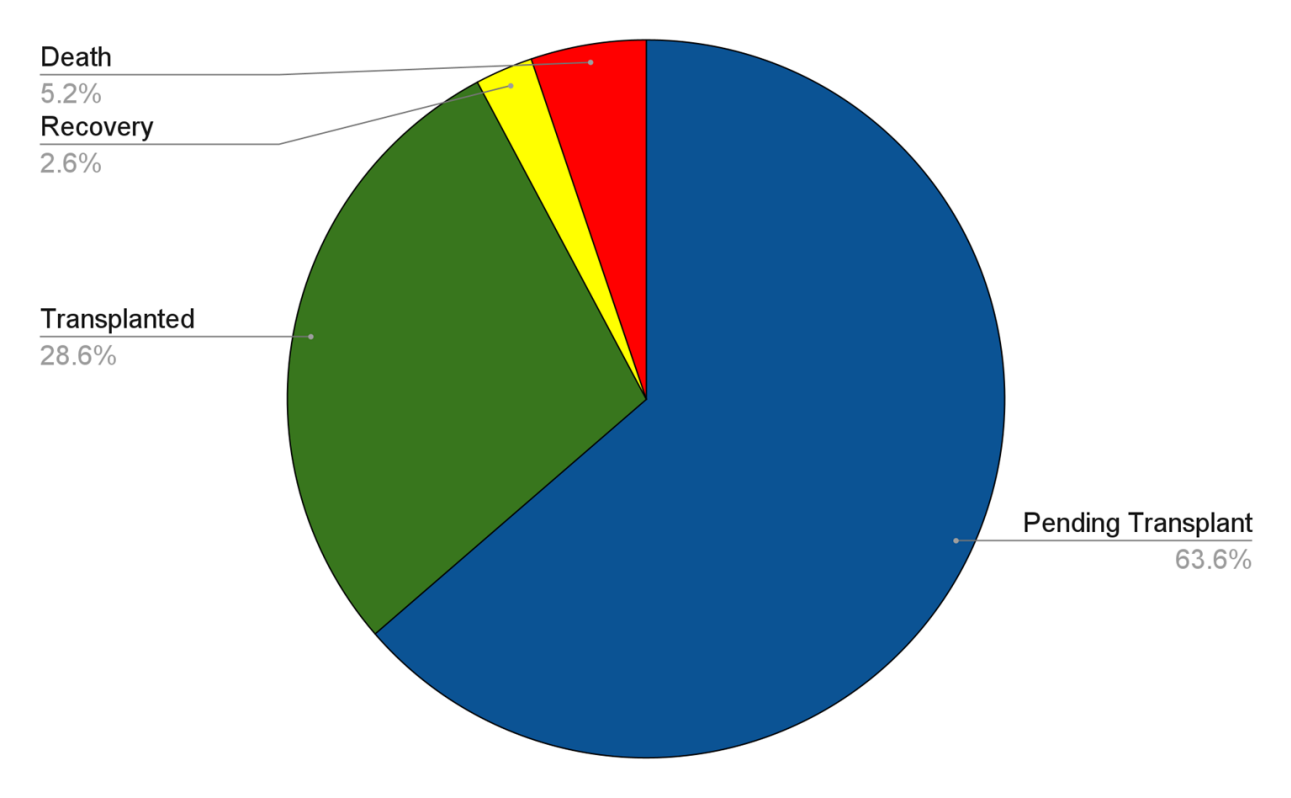


Interval SG



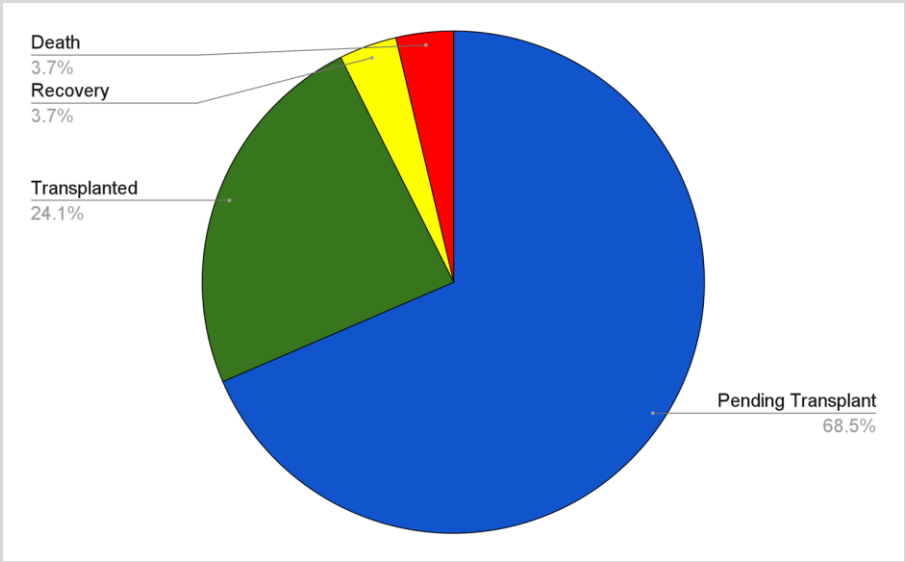
P = 0.76

Rate of Transplantation

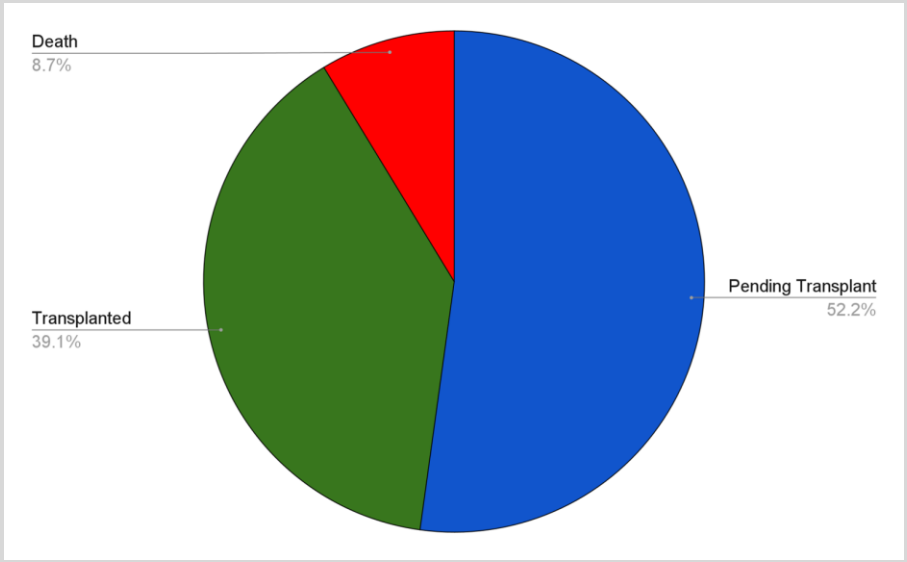


Rate of Transplantation

Simultaneous SG/LVAD

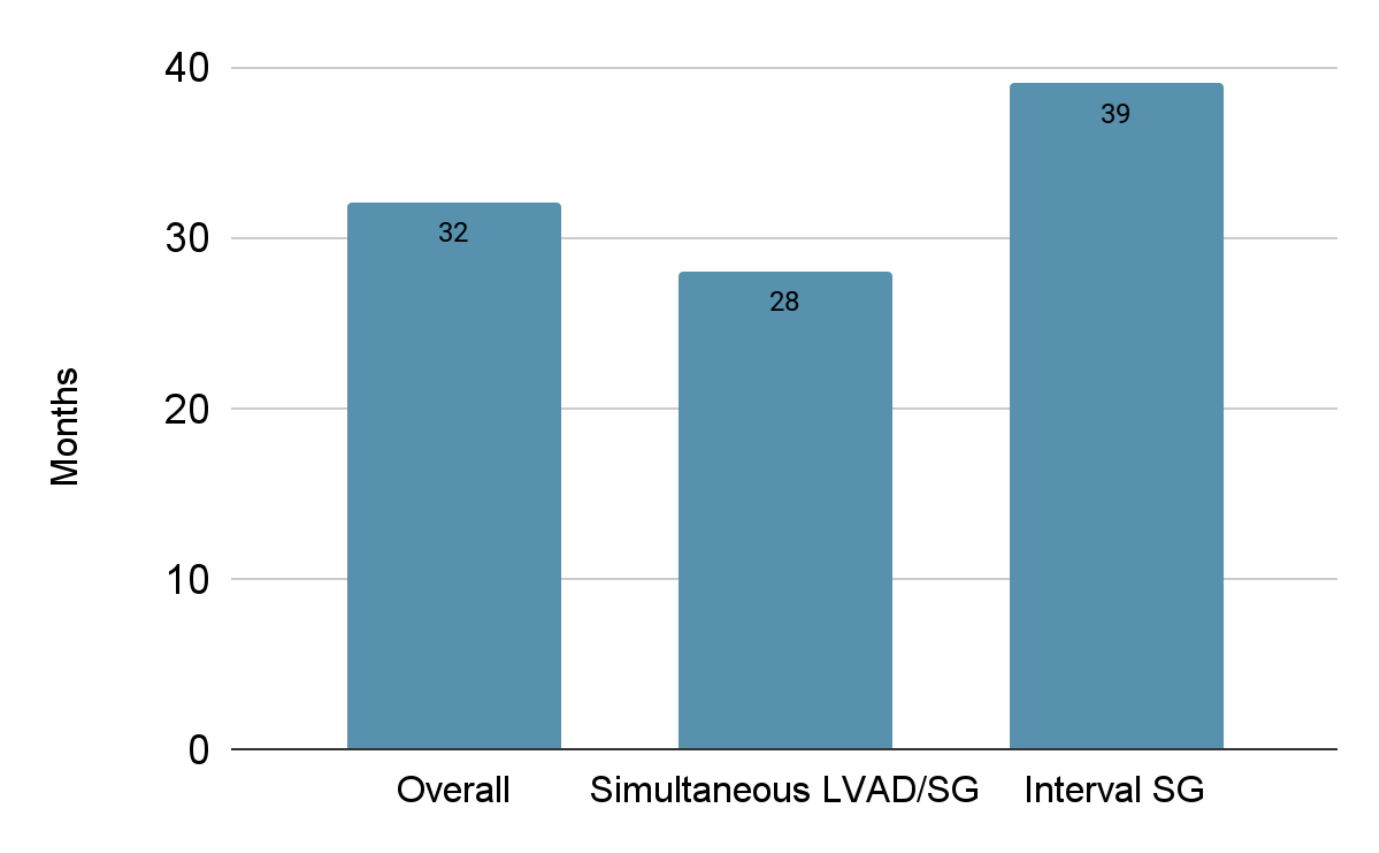


Interval SG



P = 0.29

Time to Transplantation



P = 0.16

Secondary Outcomes

	LVAD/SG (N=54)	Interval SG (N=23)	OR (95% CI)	P-Value
Readmission	36 (66.6%)	14 (60.9%)	1.29 (0.47 to 3.53)	0.79
Reoperations	16 (29.6%)	7 (30.4%)	0.96 (0.33 to 2.79)	1.00
AKI	39 (72.2%)	13 (56.6%)	2.00 (0.72 to 5.52)	0.19
Transfusions	21 (38.9%)	16 (69.6%)	0.28 (0.10 to 0.79)	0.02
LOS, Mean (SD)	19 (15-27)	21 (18-26)	-	0.52
%EBWL, Mean (SD)	53 (26)	58 (23)	-	0.49
%TBWL, Mean (SD)	27 (14)	26 (13)	-	0.71

Limitations

- Procedural trend
- Small number of patients

Conclusion

- Sleeve gastrectomy increases patient candidacy for transplantation
- Simultaneous LVAD/SG is safe

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