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## ABSTRACT

**Background and Aims:** Endoscopic sleeve gastroplasty (ESG) is an incisionless, transoral, restrictive bariatric procedure designed to imitate sleeve gastrectomy (SG). Comparative studies are limited and there is a lack of large-scale population-based data. Additionally, no studies have examined the impact of race on outcomes after ESG. This study aims to compare short-term outcomes of ESG to SG and evaluate racial effects on short-term outcomes after ESG.

**Methods:** We retrospectively analyzed over 600,000 patients in the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database from 2016-2020. We compared occurrences of adverse events (AE), readmissions, re-operations, and re-interventions within 30-days after procedure. Multivariate regression evaluated the impact of patient factors, including race, on AE.

**Results:** A total of 6,054 patients underwent ESG and 597,463 underwent SG. AE were low after both procedures with no significant difference in major adverse events (SG: 1.1% vs ESG: 1.4%,  $p > 0.05$ ). However, patients undergoing ESG had more readmissions (3.8% vs 2.6%), re-operations (1.4% vs 0.8%), and re-interventions (2.8% vs 0.7%) within 30 days ( $p < 0.05$ ). Race was not significantly associated with AE after ESG, with black race associated with higher risk of AE in SG.

**Conclusions:** ESG demonstrates a comparable major adverse event rate to SG. Race did not impact short-term AE after ESG. Further prospective studies long term studies are needed to compare ESG with SG.

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## INTRODUCTION

- ✓ Less than 1% of qualified patients undergo bariatric surgery, often due to concern regarding surgical risk
- ✓ Endoscopic Sleeve Gastroplasty (ESG) is a promising alternative to Surgical Sleeve Gastrectomy (SG).
- ✓ Comparative studies of ESG and SG are limited
- ✓ No studies have examined the impact of race on outcomes after ESG

## METHODS AND MATERIALS

Patients who underwent **ESG or SG** at an accredited American Society of Metabolic and Bariatric Surgery (ASMBS) center from 2016-2020



Propensity matching in 1:5 ratio of ESG to SG patients

- ✓ Comparison of safety and efficacy
- ✓ Multivariable logistic regression to query the effect of patient characteristics, including race, on adverse events

## RESULTS

Baseline Characteristics of Patients Undergoing Endoscopic Sleeve Gastroplasty and Sleeve Gastrectomy			
	ESG (n = 6,054)	SG (n= 30,270)	P-value
Mean Age, years (SD)	47.47 (11.44)	44.87 (11.94)	<0.001
Mean BMI (SD)	40.55 (8.66)	42.80 (6.17)	<0.001
Gender, n (%)			<0.001
Female	5116 (84.5)	24,926 (82.3)	
Race, n (%)			0.350
White	4301 (71.0)	21133 (69.8)	
Black or African American	1113 (18.4)	5903 (19.5)	
Smoker, n (%)	346 (5.7)	1839 (6.1)	0.296
ASA Physical Status Class, n (%)			<0.001
ASA II - Mild systemic disease	2200 (36.3)	8509 (28.1)	
ASA III - Severe systemic disease	3637 (60.1)	20911 (69.1)	
Diabetes, n (%)	1040 (17.3)	5775 (20.1)	0.003
Hypertension, n (%)	2312 (38.2)	12556 (41.5)	<0.001
Renal Insufficiency, n (%)	24 (0.4)	128 (0.4)	0.856
Dialysis, n (%)	8 (0.1)	53 (0.2)	0.567
Therapeutic Anticoagulation, n (%)	157 (2.6)	675 (2.2)	0.093
GERD, n (%)	1817 (30.0)	7937 (26.2)	<0.001
Hyperlipidemia, n (%)	1025 (16.9)	5608 (18.5)	0.004
Obstructive Sleep Apnea, n (%)	1553 (25.7)	9596 (31.7)	<0.001
COPD, n (%)	55 (0.9)	295 (1.0)	0.683
Chronic Steroid Use, n (%)	95 (1.6)	525 (1.7)	0.395
History of PE, n (%)	83 (1.4)	307 (1.0)	0.017

Short-Term Postprocedural Outcomes following ESG and SG			
	ESG (n = 6,054)	SG (n=30,270)	P-value
Major Adverse Event, n (%)	86 (1.4)	340 (1.1)	0.058
Reoperation within 30 days, n (%)	86 (1.4)	238 (0.8)	<0.001
Readmission within 30 days, n (%)	231 (3.8)	794 (2.6)	<0.001
Intervention within 30 days, n (%)	171 (2.8)	209 (0.7)	<0.001
Received Treatment for Dehydration	147 (2.4)	993 (3.3)	0.001
Outpatient, n (%)			
Emergency Department Visit Not Resulting in Admission, n (%)	294 (4.9)	1786 (5.9)	0.002
Mean Change from Pre-Op to Post-Op BMI (SD)	-1.77 (2.89)	-2.36 (1.78)	<0.001
Mean Length of Stay (SD)	0.87 (2.18)	1.44 (0.97)	<0.001
Mean Procedure Length, minutes (SD)	62.90 (46.99)	71.69 (37.14)	<0.001

## Endoscopic Sleeve Gastroplasty

Patient Factor	OR	95% CI
Renal Insufficiency	10.0	1.97 – 51.0
Therapeutic Anticoagulation	3.73	1.22 - 11.44
Non-Insulin Diabetes	2.10	1.083– 4.28
Chronic Steroid Use	3.56	1.07 – 11.87
Female	0.48	0.25 - 0.94

## Sleeve Gastrectomy

Patient Factor	OR	95% CI
Therapeutic Anticoagulation	1.80	1.65 - 1.98
GERD	1.26	1.20 - 1.32
Chronic Steroid Use	1.63	1.46 - 1.83
Renal Insufficiency	1.95	1.66 - 2.28
Race: Black or African American	1.21	1.11 – 1.33
Female	0.90	0.85 - 0.95
ASA Class V – Moribund Status	6.69	1.83 – 24.4

## DISCUSSION & CONCLUSION

- ✓ ESG has comparable safety to SG. Major Adverse Events were low
- ✓ Patients undergoing ESG had more readmissions (3.8% vs 2.6%), re-operations (1.4% vs 0.8%), and re-interventions (1.4% vs 0.8%)
- ✓ Black race predicts adverse events after SG, but not ESG

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