

Racial Disparities in Surgical Outcomes of Abdominal Contouring Procedures: Retrospective Analysis of 8,643 Patients from the ACS-NSQIP

Hani Y. Nasr MD¹, Daniel J. Ceradini MD¹, Pierre B. Saadeh MD¹
¹NYU Langone Health, Hansjörg Wyss Department of Plastic Surgery



Hansjörg Wyss Department of Plastic Surgery

INTRODUCTION

- **Prevalence of obesity** in the United States **increased 12%** from 2000 to 2018¹
- **Number of bariatric surgeries** performed between the years 2011 and 2019 **increased 62%**²
- **Abdominal contouring** procedures have **increased 247%** in the United States from 2010 to 2019 (ACS-NSQIP)
- **Complication rates remain relatively high** and there are **racial disparities** with their utilization³
- Scarcity of data of related to racial disparities in outcomes, described in the literature in other surgical sub-specialties⁴

PURPOSE

Evaluate relationship between race and post-operative outcomes in patients undergoing abdominal contouring procedures.

METHOD

- **ACS-NSQIP** queried for the years **2015-2019**
- Retrospective review of all **adult patients** who underwent either **Panniculectomy** (CPT 15830) or **Abdominoplasty** (CPT 15847)
- Stratified by race: **(1) Non-Hispanic White (NHW)**, **(2) African American (AA)**, **(3) Hispanic White (HW)** or **(4) Asian**
- Exclusion: (1) missing demographic information/outcomes, (2) all other races (insufficient case numbers for meaningful analysis)
- **Univariate analysis** performed to compare post-operative outcomes amongst races, followed by **multivariate logistic regression** to adjust for confounders

RESULTS

	NHW <i>n</i> = 6294 (72.7%)	AA <i>n</i> = 1606 (18.6%)	HW <i>n</i> = 633 (7.3%)	Asian <i>n</i> = 120 (1.4%)	<i>p</i>
Smokers	597 (9.5)	109 (6.8)	37 (5.8)	5 (4.2%)	< 0.01
HTN	1669 (26.5)	604 (37.6)	157 (24.8)	19 (15.8)	< 0.01
DM	727 (11.6)	189 (11.8)	74 (11.7)	10 (8.3)	0.73
Steroid Use	148 (2.4)	27 (1.4)	7 (1.1)	0 (0)	0.03
BMI (Mean ± SD)	31.9 ± 8.8	33.6 ± 7.8	32.2 ± 9.3	27.5 ± 5.7	< 0.01
Age (Mean ± SD)	47.3 ± 12.6	45.0 ± 10.9	45.3 ± 11.1	44.0 ± 12.1	< 0.01

Table 1: Demographics, Stratified by Race

Demographics	<i>n</i> = 8,643	NHW <i>n</i> (%)	AA <i>n</i> (%)	HW <i>n</i> (%)	Asian <i>n</i> (%)	<i>p</i>
Age in years (mean±SD)	46.7 ± 12.2					
BMI (mean ± SD)	32.2 ± 8.6					
Female	7662 (88.5)					
Smokers	748 (8.6)					
Hypertension	2449 (28.3)					
Diabetes	1000 (11.6)					
Steroid Use	182 (2.1)					
Primary Outcomes						
Superficial SSI	364 (4.22)	300 (4.8)	45 (2.8)	19 (3.0)	0 (0)	<0.01
Deep SSI	106 (1.22)	81 (1.3)	17 (1.1)	8 (1.3)	0 (0)	0.56
Organ Space SSI	35 (0.40)	28 (0.4)	4 (0.2)	3 (0.5)	0 (0)	0.62
Dehiscence	97 (1.12)	71 (1.1)	22 (1.4)	4 (0.6)	0 (0)	0.31
Return to OR	334 (3.85)	247 (3.9)	66 (4.1)	20 (3.2)	1 (0.8)	0.25
Readmission	435 (5.02)	348 (5.5)	60 (3.7)	24 (4.3)	0 (0)	<0.01
Secondary Outcomes						
Pneumonia	33 (0.40)	31 (0.5)	1 (0.1)	1 (0.2)	0 (0)	0.05
DVT	42 (0.49)	31 (0.5)	10 (0.6)	1 (0.2)	0 (0)	0.45
PE	45 (0.52)	31 (0.5)	12 (0.7)	2 (0.3)	0 (0)	0.42
AKI	8 (0.10)	6 (0.1)	1 (0.1)	1 (0.2)	0 (0)	0.90
UTI	59 (0.70)	46 (0.7)	8 (0.5)	4 (0.6)	1 (0.8)	0.78

Table 2: Demographics and Complications

	NHW <i>n</i> (%)	AA <i>n</i> (%)	HW <i>n</i> (%)	Asian <i>n</i> (%)	<i>p</i>
Primary Outcomes					
Superficial SSI	300 (4.8)	45 (2.8)	19 (3.0)	0 (0)	<0.01
Deep SSI	81 (1.3)	17 (1.1)	8 (1.3)	0 (0)	0.56
Organ Space SSI	28 (0.4)	4 (0.2)	3 (0.5)	0 (0)	0.62
Dehiscence	71 (1.1)	22 (1.4)	4 (0.6)	0 (0)	0.31
Return to OR	247 (3.9)	66 (4.1)	20 (3.2)	1 (0.8)	0.25
Readmission	348 (5.5)	60 (3.7)	24 (4.3)	0 (0)	<0.01
Secondary Outcomes					
Pneumonia	31 (0.5)	1 (0.1)	1 (0.2)	0 (0)	0.05
DVT	31 (0.5)	10 (0.6)	1 (0.2)	0 (0)	0.45
PE	31 (0.5)	12 (0.7)	2 (0.3)	0 (0)	0.42
AKI	6 (0.1)	1 (0.1)	1 (0.2)	0 (0)	0.90
UTI	46 (0.7)	8 (0.5)	4 (0.6)	1 (0.8)	0.78

Table 3: Univariate Analysis (Chi-Square) Comparing Outcomes Between Races

	AA OR	AA <i>p</i>	HW OR	HW <i>p</i>	Asian OR	Asian <i>p</i>
Primary Outcomes						
Superficial SSI	0.52	< 0.01	0.62	0.04	0.00	1.00
Deep SSI	0.72	0.24	1.01	0.97	0.00	1.00
Organ Space SSI	0.49	0.20	1.16	0.81	0.00	1.00
Dehiscence	1.02	0.94	0.56	0.26	0.00	1.00
Return to OR	1.03	0.86	0.85	0.48	0.27	0.20
Readmission	0.61	< 0.01	0.79	0.25	0.00	1.00
Secondary Outcomes						
Pneumonia	0.11	0.03	0.33	0.28	0.00	1.00
DVT	0.85	0.67	3.21	0.25	0.00	1.00
PE	1.57	0.20	0.66	0.57	0.00	1.00
AKI	0.90	0.92	1.91	0.57	0.00	1.00
UTI	0.73	0.43	0.92	0.87	1.52	0.68

Table 4: Multivariate Logistic Regression, Adjusted for Confounders, NHW Race as Reference

RESULTS

- Total patients: 8,643
- Non-Hispanic White patients were older, smoked more frequently, and more likely to be on chronic steroid regimen (**Table 1**)
- African American patients had higher average BMI and rates of hypertension (**Table 1**)
- Univariate analysis: Non-Hispanic White patients with increased odds of developing superficial surgical site infections (SSI) and requiring readmission within the 30-days (**Table 3**)
- Multivariate logistic regression: **Non-Hispanic White** patients had **increased odds** of developing **superficial SSI**, **post-operative pneumonia**, and requiring **readmission within 30-days** (**Table 4**)

CONCLUSIONS

- I. **Non-Hispanic White race** was an **independent risk factor** for **superficial surgical site infections (SSI)**, **post-operative pneumonia**, and **readmission** within 30-days
- II. **Large disparity in utilization of abdominal contouring amongst racial groups**, minority populations undergo abdominal contouring less frequently.
- III. **Increasing BMI** was an **independent risk factor** for multiple surgical and medical post-operative complications

Further investigation warranted to identify other potential factors contributing to this disparity, and identify barriers preventing access for minority populations

REFERENCES

1. U.S. Department of Health & Human Services CDC. Adult Obesity Facts. Center Disease Control. 2021. <https://www.cdc.gov/obesity/data/adult.html>
2. American Society of Metabolic and Bariatric Surgery. Estimate of Bariatric Surgery Numbers (2011-2019). 2021. <https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers>
3. Rhemtulla IA, et. al. Improvement in racial disparity among patients undergoing panniculectomy after bariatric surgery. *Am J Surg.* July 2019;218(1):37-41.
4. Allen JG, et. al. The impact of race on survival after heart transplantation: an analysis of more than 20,000 patients. *Ann Thorac Surg.* June 2010;89(6):1956-63.