

Evaluating Racial Disparities in Postoperative Outcomes of DIEP Flap Reconstruction: A NSQIP Database Multi-Institutional Study of 12,730 Patients

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Background

Breast cancer treatment, including mastectomy, has complex biopsychosocial ramifications. However, breast reconstruction has been shown to increase psychological well-being and overall quality of life in breast cancer survivors. The deep inferior epigastric perforator flap (DIEP) has become the gold standard technique for permanent breast reconstruction, acclaimed for its muscle-sparing approach. However, disparities in postoperative outcomes related to race remain to be fully understood. This study evaluates the risks associated with DIEP and aims to delineate comprehensive risk profiles across different racial groups.

Research Objectives

1. To evaluate the risks associated with Deep Inferior Epigastric Perforator (DIEP) flap procedures.
2. To delineate comprehensive risk profiles across different racial groups undergoing DIEP flap reconstruction.
3. To analyze operative duration, hospital stay, surgical site infection (SSI) rates, and 30-day reoperation and readmission rates among African American, Hispanic-White, and White patients undergoing DIEP flap surgery.
4. To assess disparities in postoperative outcomes, including hospitalization duration, total operation time, time to discharge, occurrence of superficial surgical site infections, and days from operation to SSI complication, across different racial groups.
5. To discuss the implications of the observed racial disparities in DIEP flap surgery outcomes and propose tailored postoperative management strategies to address these disparities.

Methods

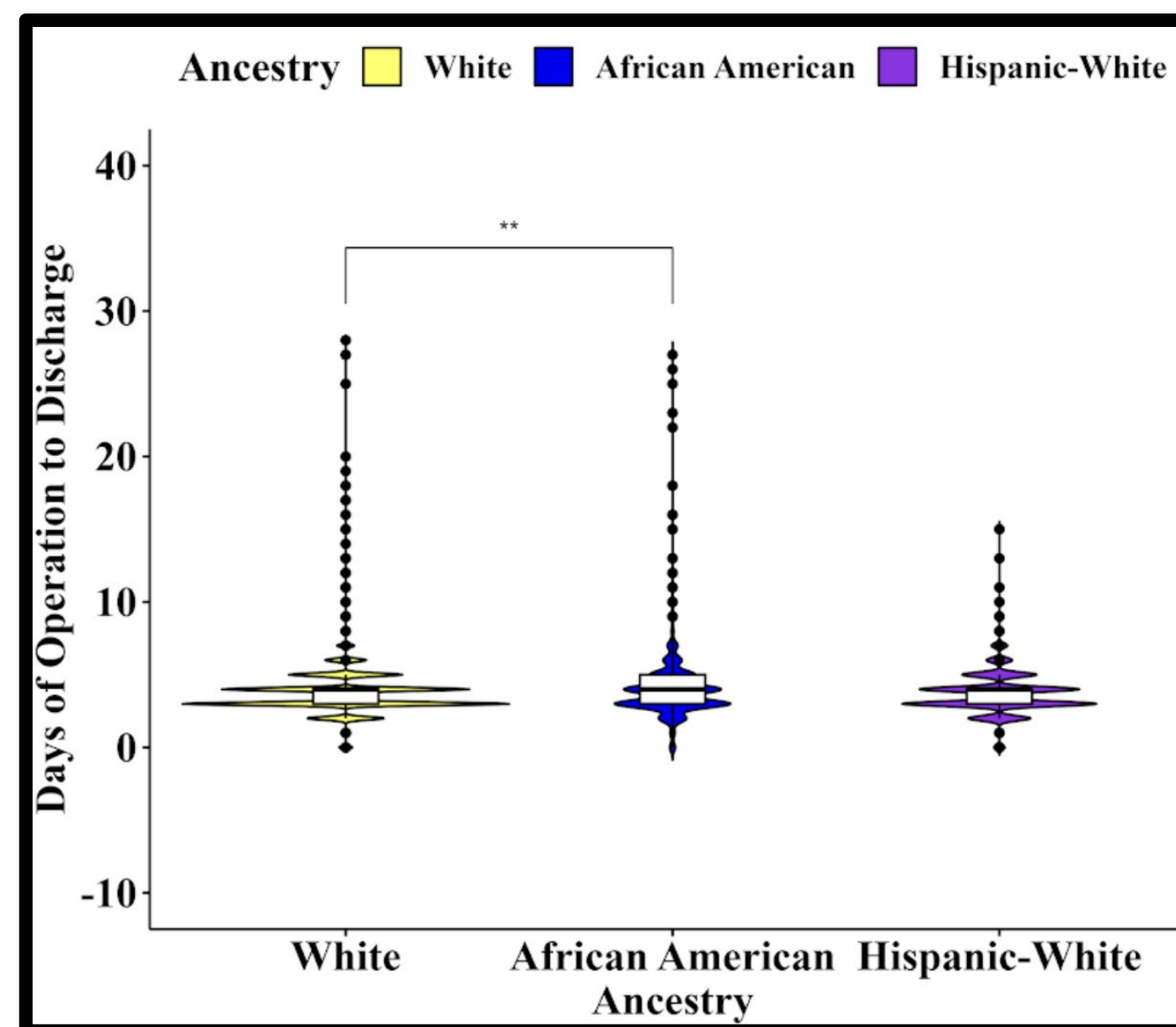
We analyzed DIEP flap procedures (CPT 19364) from the National Surgical Quality Improvement Program (NSQIP) database, spanning 2007-2022. The cohort of 12,730 patients was categorized by race—African American (2193), Hispanic-White (922), and White (9615). Evaluated parameters included operative duration, hospital stay, surgical site infection (SSI), and 30-day reoperation and readmission rates.

Data Table 1. Measure of outcome variance across ancestries

Outcome	Probability
Occurrences of Pneumonia	0.04801141927
Number of Pneumonia Occurrences	0.03997376844
Days from Operation until Superficial Incisional SSI Complication	0.002654419318
Occurrences Superficial surgical site infection	0.002518072767
Total operation time	0.001192199054
Preop Transfusion of >= 1 unit of whole/packed RBCs in 72 hours prior to surgery	0.0001241395804
Days from Operation to Discharge	8.31E-07
Length of total hospital stay	2.17E-07

ANOVA tests were performed between the measured outcomes of interest to assess their variance between ancestry groups.

Figure 1. Distribution of Postoperative Hospital Stay by Ancestry



The notched box plots illustrate the days from operation to discharge for patients categorized into three ancestry groups: White, African American, and Hispanic-White. The central line in each box denotes the median, the notches represent the confidence interval around the median, and the whiskers extend to the most extreme data points not considered outliers

Results

- African American patients experienced longer median hospital stays compared to White patients ($p < 0.01$) (Figure 1).
- Disparities across ancestries were also evident in total operation time and time to discharge ($p < 0.001$), as well as in occurrences of superficial surgical site infection (SSI) ($p < 0.01$), and days from operation to SSI complication ($p < 0.01$), (Data Table 1).

Limitations

- **Data Source Limitations:** The study relies on data from the National Surgical Quality Improvement Program (NSQIP) database, which may have inherent limitations such as potential inaccuracies or missing data.
- **Sample Size and Representation:** While the study includes a substantial sample size of 12,730 patients, there may be variations in sample representation across different racial groups, potentially affecting the reliability of comparisons.
- **Confounding Factors:** The analysis may not fully account for all potential confounding variables that could influence postoperative outcomes, such as socioeconomic status, access to healthcare, comorbidities, or surgeon expertise.

Conclusions

- Preliminary findings indicate significant racial disparities in DIEP flap surgery outcomes.
- African Americans faced longer hospitalization, suggesting the need for tailored postoperative management.
- Understanding the underlying reasons for extended hospital durations is imperative, as they carry significant socioeconomic implications, including delayed return to work and potential financial strain.
- Understanding these disparities is crucial to improving surgical care and ensuring equitable health outcomes for all racial groups.