

Socioeconomic Disadvantage Does Not Predict Reconstructive Approach Following Mastectomy at a Relative Value Unit-Based Academic Medical Center



UVA Health

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INTRODUCTION

- Insurance type and SES influence reconstructive modality: commercial insurance is associated with autologous reconstruction; Medicare/Medicaid with implant-based reconstruction¹
- Higher ADI has been linked to increased implant-based complication rates (34% vs. 21%)²
- The ADI is a validated composite measure of neighborhood-level disadvantage derived from census data spanning income, education, employment, and housing quality³
- Our institution operates under an RVU-based compensation model, which standardizes reimbursement by procedural complexity rather than payer type⁴
- No prior studies have examined whether ADI predicts reconstructive modality or timing within an RVU-based system

METHODS

- Retrospective review at a single academic medical center, July 2017–October 2023
- 263 free flap patients, 713 implant/TE patients (N = 976) ADI calculated using study-sample ZIP codes as the reference population (sociome package, R); higher ADI = greater neighborhood-level disadvantage
- Primary outcomes: reconstructive modality (free flap vs. implant/TE) and timing (immediate vs. delayed) Secondary outcomes: operative duration, length of stay, opioid utilization, total charges, cost, estimated reimbursement, and margin
- Complications: DVT, PE, fat necrosis, hernia/bulge
- Multivariable logistic regression for binary outcomes; multivariable linear regression for continuous outcomes
- Adjusted for age, BMI, smoking, comorbidities, prior chemotherapy, prior radiation, and laterality

RESULTS

Characteristic	Free Flap (n=263)	Implant/TE (n=713)	p-value
Age, mean ± SD (years)	51.2 ± 10.6	50.0 ± 11.9	0.12
BMI, mean ± SD (kg/m ²)	29.9 ± 6.0	28.0 ± 6.4	< 0.01
ADI, mean ± SD	98.9 ± 16.7	97.4 ± 16.3	0.22
Immediate reconstruction	66.9%	35.9%	< 0.01
Unilateral reconstruction	52.1%	43.8%	0.02
Prior radiation	23.6%	17.7%	0.04
Neoadjuvant chemotherapy	29.3%	37.2%	0.03
Current smoking	6.5%	6.0%	0.88
Hypertension	25.9%	32.8%	0.04
Coronary artery disease	2.7%	7.0%	0.009
Congestive heart failure	1.1%	5.9%	< 0.01
Vascular disease	4.2%	0%	< 0.01

Flap vs. Implant/TE

Predictors of flap reconstruction

Immediate timing
OR = 4.89, p < 0.01

Prior radiation
OR = 2.62, p < 0.01

Higher BMI
OR = 1.07, p < 0.01

Older age
OR = 1.02, p = 0.05

Predictors of implant reconstruction

Neoadjuvant chemotherapy
OR = 0.69, p = 0.049

Hypertension
OR = 0.61, p = 0.01

Immediate vs. Delayed

Predictors of immediate reconstruction

Flap reconstruction
OR = 4.72, p < 0.01

Unilateral laterality
OR = 1.75, p < 0.01

Predictors of delayed reconstruction

Prior radiation
OR = 0.19, p < 0.01

Older age
OR = 0.98, p < 0.01

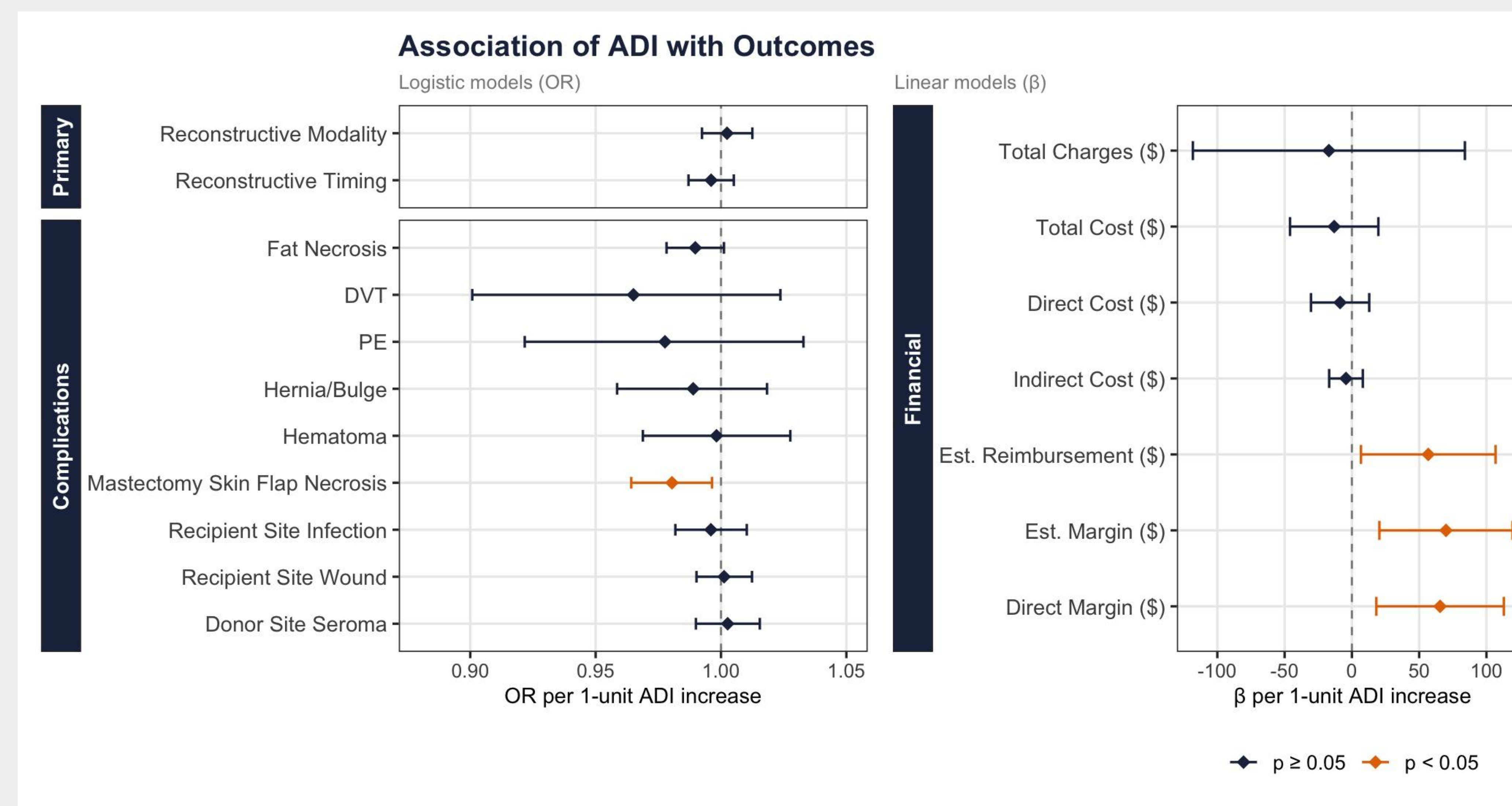
Higher BMI
OR = 0.97, p = 0.04

DISCUSSION & CONCLUSION

- ADI was not associated with reconstructive modality or timing, in contrast to prior reports linking insurance type and SES to reconstructive choice
- Reconstructive decisions were driven by clinical factors: prior radiation, BMI, age, and treatment history
- The RVU-based compensation model may attenuate financial disincentives for complex autologous procedures, contributing to equitable access across socioeconomic strata
- ADI was not associated with postoperative complications, suggesting equitable clinical outcomes regardless of neighborhood-level disadvantage
- Higher ADI was associated with greater reimbursement and margin, likely reflecting differences in payer mix or resource utilization rather than differences in care delivery
- Generalizability is limited by the single-center, retrospective design and the specific RVU-based compensation environment at our institution
- Future work should evaluate whether similar patterns are observed across institutions with different compensation structures

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ADI was also not significantly associated with any of the continuous operative outcomes we examined: operative duration, length of stay, ICU stay, average daily MME, or total opioid use