Risk Factors for Complications in Immediate Tissue Expander Breast Reconstruction Across Different BMIs

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Introduction

Two-staged expander-implant breast reconstruction a common reconstructive choice for women after mastectomy[1]. While high BMI can increase post-operative complications[2,3], it is unclear how BMI interacts with other risk factors such as acellular-dermal matrix (ADM) use, pre-pectoral plane of reconstruction, radiation, chemotherapy, and other medical co-morbidities.

Objective: Explore how BMI interacts with multi-factorial risk factors to impact safety of expander-implant reconstruction.

Methods

We retrospectively reviewed all patients undergoing immediate two-stage expander breast reconstruction at a single institution from 2017-2023. 187 patients met inclusion criteria and were stratified into 6 BMI cohorts.

Primary outcomes were post-operative complications (infection, wound, seroma, mastectomy skin flap necrosis, and implant loss).

Class (BMI)	n (%)
Underweight (<18.5)	6
Normal Weight (18.5-24.9)	59
Overweight (25.0-29.9)	58
Class I Obesity (30.0-34.9)	34
Class II Obesity (35.0-39.9)	20
Class III Obesity (≥ 40.0)	10

Results
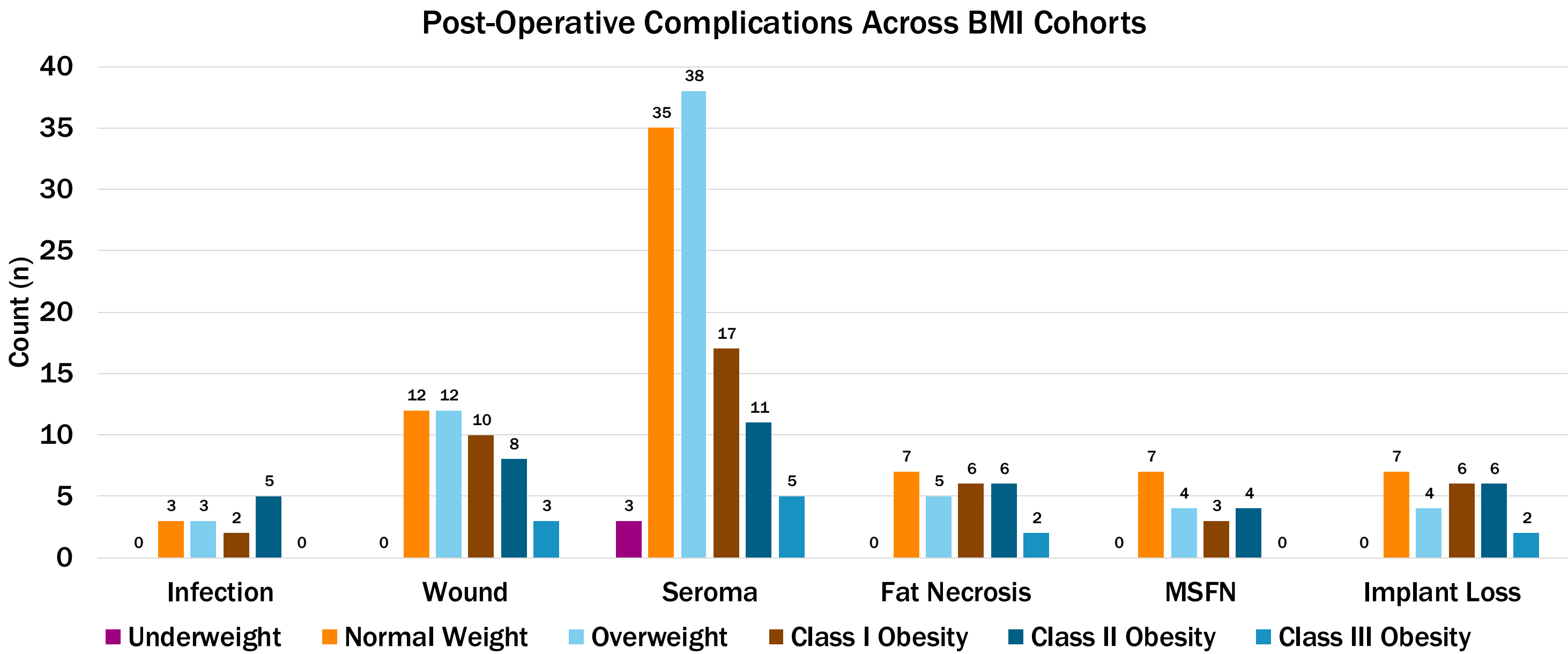
Figure I. Post-operative complications across the six BMI cohorts, including infection, wound, seroma, fat necrosis, mastectomy skin flap necrosis (MSFN), and implant loss
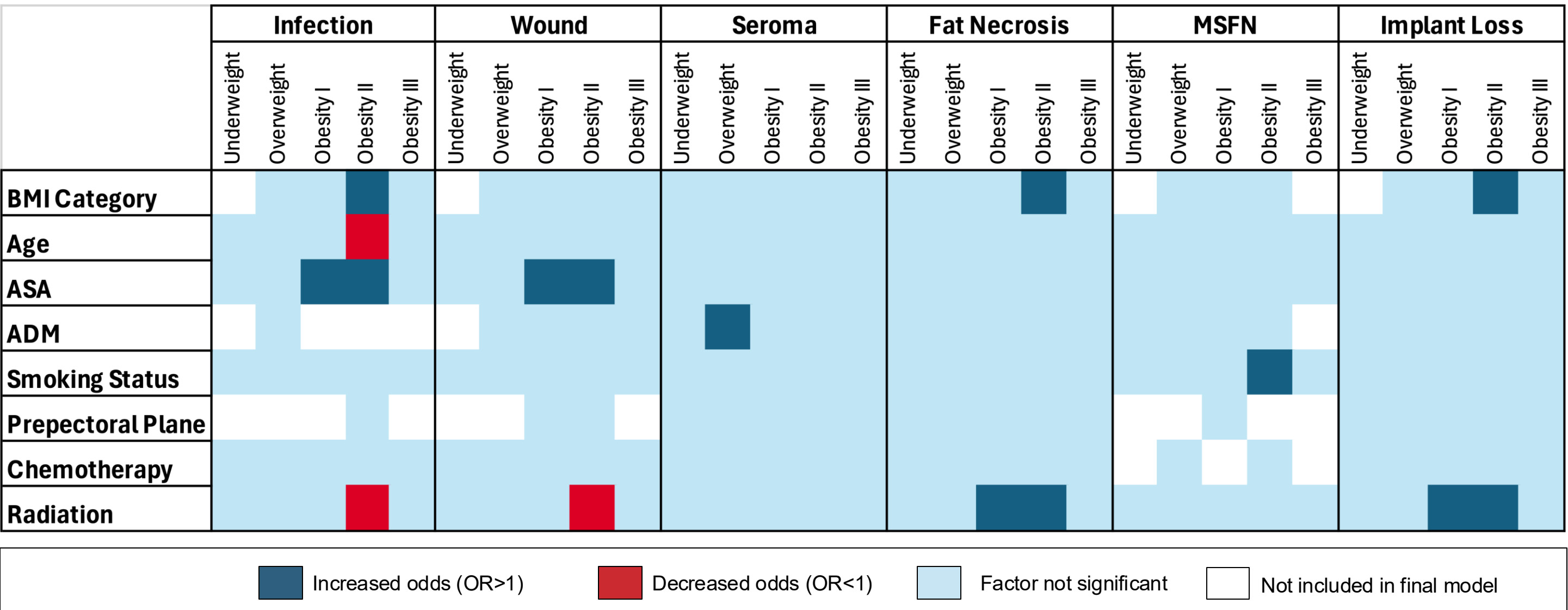
Figure II. Heat map graph summarizing multi-variable logistic regression model results. Normal weight was used as a baseline for comparison.

Factors included in the model are presented within the rows (BMI, age, ASA score, ADM, smoking, pre-pectoral plane, chemotherapy, and radiation). The models predicted post-operative complications (infection, wound, seroma, fat necrosis, MSFN, and implant loss), repeated across the BMI cohorts. Results of increased or decreased odds had statistically significant odds-ratios (p<0.05).

Discussion

Patient factors: Adjuvant radiation increased risk of implant loss with odds-ratio of 6.61 (p=0.036) in the class I cohort, which increased to 7.02 (p=0.026) in the class II cohort. ASA status increased infection and wound in class I/II cohorts.

Operative factors: ADM increased risk of seroma in overweight patients only (OR 7.23, p=0.008). Pre-pectoral reconstruction had no significant association with complications.

BMI as predictor: Class II was the only BMI classification that independently increased complications. When examined as a continuous factor, BMI increased risk of wound (OR 1.06, p=0.039), fat necrosis (OR 1.08, p=0.035), and implant loss (OR 1.09, p=0.031).

Conclusion

Individual patient and operative risk factors may be modulated by BMI class. Comprehensive assessment of these factors rather than BMI alone is important to guide safety assessment of implant reconstruction.

References

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