The Impact of Metabolic Syndrome in Breast Reconstruction Decision-Making and Post-Operative Outcomes: A Nationwide Analysis

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Introduction

- Metabolic syndrome (MetS) is defined by a constellation of cardiometabolic abnormalities, including hypertension, obesity, insulin resistance, and dyslipidemia.1
- The prevalence of MetS among U.S. adults has increased to epidemic proportions, increasing from 25.3% in 1988-1994 to 34.2% in 2007-2012.1
- This prevalence has substantial implications for postoperative outcomes, with mounting evidence revealing elevated risks of postoperative myocardial infarction, pulmonary complications, renal dysfunctions, and prolonged hospital stays in patients with MetS.2,4
- Within breast cancer patients, the prevalence of MetS is especially elevated and can be attributed to the detrimental interplay of insulin resistance and obesity on cellular dynamics.5,6
- The safety profiles of patients with MetS undergoing breast reconstruction (BR) remain poorly understood.

Objectives

- To evaluate the impact of MetS on breast reconstruction decision-making process and postoperative complication rates.

Methods

- Retrospective study
- The American College of Surgeons National Surgical Quality Improvement Program database.
- Identified women undergoing BR from 2012-2021 using CPT codes.
- MetS was defined as patients meeting the following criteria:
  - Medically treated for diabetes mellitus. Medically treated for hypertension. Body mass index ≥ 30 kg/m².
  - T-tests and Fisher’s Exact tests assessed group differences.
  - Multivariate logistic regression models evaluated differences in complications between groups.
  - Stata Statistical Software version 18.0

Results: Demographics

- A total of 254,932 patients underwent outpatient BR.
  - MetS: 4,570 patients.
  - Non-MetS: 155,545 patients.
- Patients with MetS were older, and had greater proportions of CHF, COPD, and preoperative dialysis (p<0.001).
- No differences found amongst smoking history, steroid use, bleeding disorders, disseminated cancer, sepsis, and functional status.

Results: Post-Operative Complications

- Logistic regression models demonstrated a higher likelihood of the following post-operative complications in the MetS group compared to the Non-MetS patients:
  - Post-operative wound complications (OR 2.21; 95%CI 1.399-3.478; p=0.001), and
  - Readmission rates (OR 2.045; 95%CI 1.337-3.128; p=0.001)

<table>
<thead>
<tr>
<th>Mild Systemic Complications</th>
<th>Severe Systemic Complications</th>
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<tbody>
<tr>
<td>OR (95% CI)</td>
<td>P-value</td>
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<tr>
<td>Non-MetS Reference</td>
<td>Reference</td>
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<tr>
<td>MetS 1.147 (0.539, 2.211)</td>
<td>0.683</td>
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<thead>
<tr>
<th>Wound Complications</th>
<th>Readmission</th>
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<tr>
<td>Odds ratio</td>
<td>95% CI</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.611</td>
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<tr>
<td>Hypertension</td>
<td>1.257</td>
</tr>
<tr>
<td>Obesity</td>
<td>1.078</td>
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</tbody>
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Diabetes and obesity were identified as significant independent risk factors associated with a higher likelihood of post-operative wound complications.

Conclusions

- Logistic regression models revealed no significant differences in the types of breast reconstruction received across cohorts.
- Patients with MetS are at increased risk of postoperative wound complications and readmission following breast reconstruction.
- The synergistic effects of these comorbidities on post-operative outcomes underscore the importance of addressing MetS as a holistic condition and considering choosing DBR over IBR in this population.
- Thus, integrating MetS management and patient counseling at various stages of BR may improve outcomes and facilitate patient decision-making.

References