CRITICAL ASSESSMENT OF IMMEDIATE BREAST RECONSTRUCTION: ANALYSIS OF 10,958 PATIENTS FROM THE ACS – NSQIP DATABASE

Carisa M Cooney MPH, Pablo Baltodano MD, José M Flores MPH, Miceile D Barrett BS, Karim A Sarhane MD MScs, Marcelo Lacayo MD, Anne Tong MD, Mark M Melendez MD MBA, Francis M Abreu BS, and Gedge P Rosson MD

Background
To evaluate 30-day postoperative-morbidity of the most common immediate breast reconstruction procedures: tissue expander (TE), implant, and flap-based reconstruction. Post-mastectomy reconstruction is integral in breast cancer management. Immediate breast reconstruction renders excellent aesthetic results, less psychosocial morbidity and higher satisfaction when compared to mastectomy alone. However, a quantitative comparison of procedure-specific morbidity is needed to guide clinical decision making.

Methods
We analyzed all females undergoing an immediate breast reconstruction from the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) 2008-2010 databases (a prospective, risk adjusted, outcomes-based registry from selected hospitals worldwide). Demographic, preoperative, perioperative, and postoperative characteristics were compared between patients undergoing TE, implant or autologous reconstruction. Specifically, we analyzed the following outcomes: wound, flap/prosthesis, cardiac, respiratory, neurological, urinary tract, and venous thromboembolism outcomes. Logistic regression was used to compare the crude and adjusted 30-day postoperative morbidity rates between the 3 types of reconstruction (Figure 1).

Results
A total of 10,958 patients underwent immediate breast reconstruction, of whom 7,665 (69.9%) had tissue expanders, 1520 (13.9%) had implants and 1,773 (16.2%) had flap-based reconstructions. A paradigm shift in U.S. Breast reconstruction: increasing implant rates. Plast Reconstr Surg. 2013;131:15-23.

Table 1. Logistic Models for 30-day Postoperative Morbidity

<table>
<thead>
<tr>
<th>Reconstruction Procedure</th>
<th>Univariable Regression (Unadjusted Odds Ratios)</th>
<th>Multivariable Regression (Odds Ratios after extensive adjustment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR</td>
<td>95% C.I.</td>
<td>OR</td>
</tr>
<tr>
<td>Tissue Expanders</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Implants</td>
<td>1.05</td>
<td>0.631</td>
</tr>
<tr>
<td>Autologous Flaps</td>
<td>2.01</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Results (cont.)
Therefore a potential confounder of the relation between a reconstruction procedure and morbidity. After adjusting for perioperative transfusions neither implant (OR adjusted= 1.01, p=0.935) nor flap (OR adjusted= 1.14, p=0.136) procedures have significantly higher 30-day postoperative morbidity rates than tissue expander procedures.

Figure 1. Immediate Reconstruction Options

Figure 2. DIEP Flap

Figure 2. Tissue Expander

Results (cont.)
reconstruction. A total of 10,958 patients underwent immediate breast reconstruction, of whom 7,665 (69.9%) had tissue expanders, 1520 (13.9%) had implants and 1,773 (16.2%) had flap-based reconstruction (Figure 2). A total of 1253 (11.4%) patients experienced morbidity: 769 (10.0%) TE patients, 159 (10.5%) implant patients and 325 (18.3%) autologous flap patients. Univariate analysis using the TE population as the reference group showed that implants have similar morbidity rates (OR unadjusted= 1.05; p=0.613) unlike flap procedures, which were associated with higher postoperative morbidity rates (OR unadjusted= 14.02, p<0.0001). On multivariate logistic regression, perioperative transfusion was identified as the strongest independent risk factor for morbidity (OR adjusted= 14.02, p<0.0001) (Table 1).

Conclusion
This large study uses prospectively collected data to estimate morbidity rates after 3 different immediate breast reconstruction procedures. Perioperative transfusion was identified as a major independent risk factor for 30-day postoperative morbidity, resulting in a 14-fold increase in odds of morbidity. Importantly, TE, implant, and flap-based immediate reconstructions have similar postoperative morbidity rates but only after adjusting for perioperative transfusions. Our findings recommend proactive identification of any factors that might decrease the use and number of perioperative transfusions in the autologous breast reconstruction candidate.

References