Evolving Indications and Long Term Oncologic Outcomes of Risk-Reducing Bilateral Nipple-Sparing Mastectomy

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Excellent Technical Outcomes of Nipple Sparing Mastectomy Have Been Well Documented

- NSM is mostly reported as therapeutic procedure
- Low rates of complications
- Nipple necrosis ~15% of cases

From 2001 Cleveland Clinic
Nipple Sparing Mastectomy Continues to Evolve

- Increased patient satisfaction
- Higher psychosocial functioning
Risk Reducing Mastectomy Has Been Shown to Be Effective

- 90% breast cancer risk reduction
- Early reports of risk reducing mastectomy focused on simple and skin sparing mastectomy.
- There have been reports of nipple sparing mastectomy for breast cancer risk reduction
  - Focused on BRCA1/2 patients
  - Reported follow-up is short

Hartmann et al. NEJM 340(2):77-84.
Hypotheses

• Risk reducing nipple sparing mastectomy has increased over time
  - Indications have changed over time

• Risk reducing NSM is oncologically safe
Methods

• Retrospective review of prospective database (2001-2017) (indications, oncologic outcomes)
• Trends were evaluated over 4 time periods - 2001-2005; 2006-2009; 2010-2013; 2014-2017
• Statistical analysis by Kruskal-Wallis or Chi-Square tests as appropriate
• p<0.05 considered statistically significant
• IRB approval was obtained
Patient Characteristics

- 136 patients
- 272 risk reducing mastectomy
- 135 female; 1 male
- Median age = 41 years (range: 20-67 years)
Indications For Bilateral Risk Reducing Mastectomy

- BRCA 1: 46%
- BRCA 2: 26%
- PTEN: 1.5%
- TP53: 2%
- ATM: 1.5%
- Strong Family History: 14%
- LCIS/atypia: 7%
- Mantle irradiation: 3%
Number of Cases and Indications Have Evolved Over Time

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of patients</th>
<th>% with gene mutation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2005</td>
<td></td>
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<tr>
<td>2006-2009</td>
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<td></td>
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<tr>
<td>2010-2013</td>
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<td></td>
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<tr>
<td>2014-2017</td>
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</tbody>
</table>

# of Cases of Bilateral Nipple Sparing Mastectomy for Risk Reduction

% of Patients Having Risk Reducing Mastectomy for Risk Reduction
Oncologic Followup Following Risk Reducing Bilateral NSM

- Mean/Median Follow-up: 53 months/38 months
- 61 patients > 4 year follow-up
- No patients have developed breast cancer in this series
### Follow-up Among Patients with Genetic Mutations

<table>
<thead>
<tr>
<th>Genetic Mutation</th>
<th># patients</th>
<th>Median Age (range) at time of bilateral NSM</th>
<th>Follow-up (mean/median)</th>
<th>Breast Cancer Following Risk-Reducing NSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRCA1 or BRCA2</td>
<td>97</td>
<td>39 years (20-67 years)</td>
<td>30 mo./42 mo.</td>
<td>0%</td>
</tr>
<tr>
<td>PTEN</td>
<td>2</td>
<td>30 years (25-35 years)</td>
<td>54 mo./54 mo.</td>
<td>0%</td>
</tr>
<tr>
<td>TP53</td>
<td>3</td>
<td>29 years (20-40 years)</td>
<td>26 mo./32 mo.</td>
<td>0%</td>
</tr>
<tr>
<td>ATM*</td>
<td>2</td>
<td>48.5 years (47-50 years)</td>
<td>30 mo./30 mo.</td>
<td>0%</td>
</tr>
</tbody>
</table>
## Series of Risk Reducing Bilateral Mastectomy

<table>
<thead>
<tr>
<th>Author</th>
<th>Institution(s)</th>
<th>Year</th>
<th>#Risk Reducing NSMs</th>
<th>Median follow-up (mo.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sacchini et al.</td>
<td>MSKCC* Sao Paulo Univ. European Oncology Inst. Univ. Padua</td>
<td>2006</td>
<td>84</td>
<td>25 mo.</td>
</tr>
<tr>
<td>Crowe et al.</td>
<td>Cleveland Clinic (Cleveland)</td>
<td>2008</td>
<td>26</td>
<td>N/A</td>
</tr>
<tr>
<td>Peled et al.</td>
<td>UCSF</td>
<td>2014</td>
<td>52</td>
<td>N/A</td>
</tr>
<tr>
<td>Yao et al.</td>
<td>Northwestern Mass. General*</td>
<td>2015</td>
<td>298</td>
<td>N/A</td>
</tr>
<tr>
<td>Manning et al.</td>
<td>MSKCC*</td>
<td>2015</td>
<td>126</td>
<td>26 mo.</td>
</tr>
<tr>
<td>Moo et al.</td>
<td>NY Hospital-Cornell</td>
<td>2016</td>
<td>90</td>
<td>32 mo.</td>
</tr>
<tr>
<td>Grobmyer et al. (present series)</td>
<td>Cleveland Clinic (Cleveland)</td>
<td>2018</td>
<td>272</td>
<td>38 mo.</td>
</tr>
</tbody>
</table>
Conclusions

• Risk reducing bilateral NSM is increasing
• The primary indication for bilateral NSM presently is mutation in breast cancer associated gene
• Bilateral risk reducing mastectomy is effective in reducing breast cancer risk with long term follow-up
Cleveland Clinic

Every life deserves world class care.