"Advances and Surgical Decision-Making for Partial and Total Breast Reconstruction"

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Department of Plastic Surgery

No Disclosures

Matory WE, Walton, RL, et al.
Aesthetic Results Following Partial Mastectomy and Radiation Therapy.
*Plast Reconstr Surg.* 1990 May; 85(5): 739-46
Management Algorithm and Oncoplastic Techniques to Repair PARTIAL Breast Defects

A Management Algorithm to Repair Partial Mastectomy Defects

Local Tissue Rearrangement

"Breast Remodeling"

Breast Reduction Technique†

"7 Zone Designations"

Latissimus Dorsi or Thoracodorsal Artery Perforator Flap

Total Mastectomy with Immediate or Delayed-Immediate Breast Reconstruction

Brassiere Cup Size

Requires XRT even with mastectomy*

Avoid XRT if undergoes mastectomy

A- or B-Cup

C-Cup

D-Cup or Larger

Minimal of None

Breast Skin Resection Located Within Wise or Vertical Pattern

Extensive Skin Resection Located Outside of Skin Resection Pattern

Small Tumor Size

Large Tumor Size

No Breast Ptosis

Breast Ptosis

Extent of Breast Skin Resection

Patient Presents AFTER Partial Mastectomy and Partial Breast XRT


Latissimus Dorsi or Thoracodorsal Artery Perforator Flap

Intraoperative Tumor Margin

Immediate Reconstruction BEFORE XRT

Delayed Reconstruction BEFORE XRT

Brassiere Cup

Size

Requires XRT even with mastectomy*

Avoid XRT if undergoes mastectomy

A- or B-Cup

C-Cup

D-Cup or Larger

Minimal of None

Breast Skin Resection

Breast Skin Resection Located Within Wise or Vertical Pattern

Extensive Skin Resection Located Outside of Skin Resection Pattern

Small Tumor Size

Large Tumor Size

Extent of Breast Skin Resection

Patient Presents BEFORE Partial Mastectomy and XRT

Multifocal Disease

Localized Disease

BCT or Mastectomy?
Mastectomy Instead of BCT

C-Cup Breast, No Ptosis
Local Tissue Rearrangement

"Breast Remodeling"

Intraoperative Tumor Margin
Immediate Reconstruction BEFORE XRT

Dela

Y

Y

Brassiere Cup Size
A- or B-Cup
C-Cup
D-Cup or Larger

Minimal of None

Breast Skin Resection

Breast Skin Resection
Located Within Wise or Vertical Pattern

Small Tumor Size
Large Tumor Size

No Breast Ptosis
Breast Ptosis

Extent of Breast Skin Resection

Patient Presents BEFORE Partial Mastectomy and XRT

Multifocal Disease
Localized Disease


Breast Remodeling: Case Example

Breast Remodeling: Case Example

Breast Remodeling: Case Example

Management Algorithm for Breast Reduction Technique
Parenchymal Pedicle Design Based on Tumor Location

Breast Reduction Technique

Management Algorithm for Breast Reduction Technique

Breast Reduction Technique†

"7 Zone Designations"

- Zone 1 - Inferomedial Pedicle - Wise Skin Pattern
- Zone 2 - Inferolateral Pedicle - Wise Skin Pattern
- Zone 3 - Inferomedial Pedicle - Wise Skin Pattern
- Zone 4 - Amputative Inferomediolateral Pedicle
- Zone 5 - Superior Pedicle - Vertical Skin Pattern
- Zone 6 - Inferomediolateral Pedicle - Wise Pattern
- Zone 7 - Inferomedial Pedicle - Wise Skin Pattern
Management Algorithm for Breast Reduction Technique

1. **Zone 1**
   - Inferomedial Pedicle
   - Wise Skin Pattern

2. **Zone 2**
   - Inferolateral Pedicle
   - Wise Skin Pattern

3. **Zone 3**
   - Inframammary Pedicle
   - Wise Skin Pattern

4. **Zone 4**
   - Amputative Inferomedial Pedicle
   - Inframammary Pattern

5. **Zone 5**
   - Superior Pedicle
   - Vertical Skin Pattern

6. **Zone 6**
   - Inferomedial Pedicle
   - Wise Pattern

7. **Zone 7**
   - Inferomedial Pedicle
   - Wise Skin Pattern
Management Algorithm for Breast Reduction Technique

Zone 1 - Inferomedial Pedicle - Wise Skin Pattern

Zone 2 - Inferolateral Pedicle - Wise Skin Pattern

Zone 3 - Infromedial Pedicle - Wise Skin Pattern

Zone 4 - Amputative Inferomediolateral Pedicle

Zone 5 - Superior Pedicle - Vertical Skin Pattern

Zone 6 - Inferomediolateral Pedicle - Wise Pattern

Zone 7 - Infracmediolateral Pedicle - Wise Skin Pattern
Management Algorithm for Breast Reduction Technique

Breast Reduction Technique†

"7 Zone Designations"

Intraoperative Tumor Margin

Immediate Reconstruction BEFORE XRT

Delayed Reconstruction BEFORE XRT

Brassiere Cup Size

C-Cup
D-Cup or Larger

Minimal of None

Breast Skin Resection

Located Within Wise or Vertical Pattern

Small Tumor Size

Breast Ptosis

Extent of Breast Skin Resection

Patient Presents BEFORE Partial Mastectomy and XRT

Multifocal Disease

Localized Disease

Zone 3
- Inferomedial Pedicle
- Wise Skin Pattern

Zone 4
- Amputative
- Inferomediolateral Pedicle

Zone 5
- Superior Pedicle
- Vertical Skin Pattern

Zone 6
- Inferomediolateral Pedicle
- Wise Pattern

Zone 7
- Inferomedial Pedicle
- Wise Skin Pattern

Zone 2
- Inferolateral Pedicle
- Wise Skin Pattern

Zone 1
- Inferomedial Pedicle
- Wise Skin Pattern
Management Algorithm for Breast Reduction Technique

Zone 1 - Inferomedial Pedicle - Wise Skin Pattern

Zone 2 - Inferolateral Pedicle - Wise Skin Pattern

Zone 3 - Inferomedial Pedicle - Wise Skin Pattern

Zone 4 - Amputative Inferomediolateral Pedicle

Zone 5 - Superior Pedicle - Vertical Skin Pattern

Zone 6 - Inferomediolateral Pedicle - Wise Pattern

Zone 7 - Inferomedial Pedicle - Wise Skin Pattern
2 Weeks After Partial Mastectomy?

Breast Reduction Technique

Severe Deformity **AFTER** Radiation

- Latissimus Dorsi, TAP, or Intercostal Perforator (FLAP) Preferable
  - Fewer Complications
  - Need for Skin Replacement
  - Lymphedema
  - “Burn-A-Bridge”

**AFTER XRT, Good Contour**

- After XRT, Good Contour

- Total Mastectomy with Immediate Breast Reconstruction
- Lymphedema
- Autologous Fat Grafting

References:
Contralateral Breast Reduction ONLY

Patient Presents AFTER Partial Mastectomy and Whole Breast XRT

Delayed Reconstruction AFTER XRT

Contralateral Symmetry Procedure ONLY

Total Mastectomy with Immediate Breast Reconstruction

Lumpectomy Flap

Autologous Fat Grafting

Augmented Patients & BCT?

Partial Mastectomy Reconstruction

Concluding Points

“Immediate Repair BEFORE XRT”

• Avoids Need for Flap
  - Extensive Procedure
  - Most BCT Patients NOT Interested
  - Less Than Optimal Cosmetic Outcome
• Repair Based on Breast Size In-Relation to Tumor Size
  - A- or B-Cup Breast
    - Total Mastectomy with Immediate Breast Reconstruction
  - LABC (Neoadjuvant Chemotherapy) Consider Immediate Latissimus Flap
  - C-Cup Breast ➔ “Breast Remodeling Technique” ➔ AFG
  - D-Cup Breast or Larger ➔ “Breast Reduction Techniques”
  - Design Based on Tumor Location

Advances & Technical Considerations in TOTAL Breast Reconstruction

- Implant-Based
- Autologous Tissue

Intraoperative Saline-Filling of Tissue Expanders

Benefits and Technical Variations
Benefits of Intraoperative Saline-Filling of Tissue Expanders

- Avoids the need for postoperative expansion
  - Fewer subsequent office visits
  - Especially beneficial for out-of-town patients
- Can achieve a more ptotic-shaped breast reconstruction
- Psychological benefit
  - Patients awake with a breast
- Maintains thickness of mastectomy skin flaps
  - Avoids thinning already thin mastectomy skin flaps

Benefits of Intraoperative Saline-Filling of Tissue Expanders

- Allows for exchange for permanent implant within short-period of time after mastectomy
- Avoids expander displacement during expansion process
- Inflated expander allows for better preservation of inframammary fold
  - Identify Problems and Allows for Repair at Mastectomy
- Scar capsule formation begins immediately at time of mastectomy
  - “Delayed-Immediate and Delayed-Delayed “creation internal lined cavity”
  - Neoadjuvant chemotherapy in patients found to need PMRT within 4-6 weeks after mastectomy

Technical Variations

- Pectoralis Major Muscle ONLY
- Pectoralis Muscle + Serratus Anterior Muscle
- HADM Allograft + Pectoralis Muscle
  - Structural Component of Tissue Expander Pocket
  - Underlay Graft on Inferior Mastectomy Skin Flap
Pectoralis Major Muscle ONLY

• “Preferred Option”
• Usually requires a peri-areola mastectomy incision
  – Muscle Can Not Cover Racquet-Handle, Avoids Need for Serratus Muscle
• “Limit medial dissection” of pectoralis muscle to 3rd ICS
• Can serve as “baby-sitter” re-sewn back onto chest wall at time of definitive reconstruction
  – Delayed-Immediate
• Maintains a WELL-DEFINED inframammary fold

Intraoperative Saline-Filling of Tissue Expanders

Pectoralis Major Muscle ONLY

• Low Cost
• No Lower Pole muscle coverage
• Technical Aspects
  – Muscle sewn to medial, inferior, and lateral aspects of breast skin envelope
  – Temporary puckering of dermis
  – Fill ½ volume → Inset Muscle → Fill Additional ½ volume

Pectoralis Major Muscle ONLY
Intraoperative Saline-Filling of Tissue Expanders

**Pectoralis Muscle + Serratus Anterior Muscle**

- "Not Preferred Option"
- Utilize with Racquet-Handle Mastectomy Incision
- Concerns, Perfusion Lateral Breast Skin
  - Expander Exposure
  - Avoids Need for Lateral-Plication Sutures to Maintain Medial Position of Expander
- More painful and bloody dissection
- Need to disrupt an additional muscle function

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**Pectoralis Muscle + Serratus Anterior Muscle**

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**Human Acellular Dermal Matrix Allograft (HADM) + Pectoralis Muscle Structural Component of Tissue Expander Pocket**

- Avoids need to suture pectoralis muscle to breast skin envelope
- Difficult to position pectoralis muscle underneath mastectomy incision
  - Risk implant exposure because HADM, NOT vascularized tissue
  - Pectoralis muscle (blood supply) probably assists in healing thin mastectomy incision
Human Acellular Dermal Matrix Allograft (HADM) + Pectoralis Muscle Structural Component of Tissue Expander Pocket

- Usually requires 2 Pieces of HADM
  - HIGH COST (~4K)
- Anecdotal, increase risk of infection in irradiated mastectomy skin flaps
- Considerably, prolongs operative time
- Increase risk of seroma
  - May require longer drainage interval

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Human Acellular Dermal Matrix Allograft (HADM) + Pectoralis Muscle Structural Component of Tissue Expander Pocket

- To position pectoralis muscle underneath mastectomy incision, need to “pull-down” HADM
  - Flattens inferior pole of breast
  - Blunts inframammary fold
  - Adversely imparts skin envelope changes (memory)

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Human Acellular Dermal Matrix Allograft (HADM) + Pectoralis Muscle Structural Component of Tissue Expander Pocket

- HADM attached inferiorly to either:
  - IMF
    - Better muscle coverage of mastectomy incision
    - Blunting and Irregularities of IMF
    - Flattening of Inferior Pole
  - Breast Skin Envelope
    - Minimal muscle coverage underneath mastectomy incision
    - Less Blunting and Irregularities of IMF
    - Lesser Flattening of Inferior Pole
HADM Allograft + Pectoralis Muscle Structural Component of Tissue Expander Pocket

HADM Sutured IMF

HADM Allograft + Pectoralis Muscle Structural Component of Tissue Expander Pocket

HADM Sutured IMF

HADM Allograft + Pectoralis Muscle Structural Component of Tissue Expander Pocket

HADM Sutured IMF
HADM Allograft + Pectoralis Muscle
“Underlay Graft” on Inferior Mastectomy Skin Flap
- Preferred with a thin inferior mastectomy skin flap
- Only requires 1 piece of HADM
  - Lesser COST
- Can use thinner piece (not structural) of HADM
  - Lesser COST
- Pectoralis muscle sewn to breast skin envelope
  - Healing Benefit, Muscle under Mastectomy Incision
- “May Be Best of Both Worlds”
  - Avoids problems with use of HADM as structural component of expander pocket
  - But, provides additional dermal thickness to thin inferior mastectomy flap
Nipple-Sparing Mastectomy
Immediate Silicon Implant
*Incision Placement*

Conclusions

- Immediate Saline-Filling of Expanders
  - Improved Cosmetic Outcomes
  - Psychological Benefits
  - HADM, Consider IMF/Underlay Graft
- Nipple-Sparing Mastectomy with
  Immediate Insertion of Implants
  - May Be Preferred Option

Deep Inferior Epigastric Perforator (DIEP) Flaps
Background: DIEP Flap

Free TRAM Flap

- Less Disturbance of Abdominal Wall
  - Less Muscle Utilized
  - No Tunnel Required
- Less Fat Necrosis and Atrophy
  - Larger Breast Reconstructions in Larger Patients
- More “Technically” Complex
  - All or None Phenomena


Defect of Anterior Rectus Sheath Fascia

Case Example: Free TRAM Flap
Human Acellular Dermal Matrices
FASCIAL REPAIR OF TRAM FLAP DONOR SITES

• Advantages
  – Inlay graft tends to reduce tension on fascia closure
  – Maintains midline position of umbilical stalk
  – Avoids asymmetry; lower abdominal contour without need for plication of the lower abdominal abdominal fascia
  – Avoids foreign body reaction
  – Bacteria seed mesh
  – Heal if exposed from poor wound healing
  • Umbilical necrosis or Lower abdominal crease incision

• Disadvantages
  – Increased Cost
  – Laxity
  – Bulge
  – Increased Surgical Time

Outcomes of Techniques to Repair Fascia Defect
After TRAM Flap Breast Reconstruction
Boehmker and Kronowitz, PRS, March 2009

• HADM bridging inlay graft
• HADM with primary overlying fascia closure (PC)
• Polypropylene Mesh Inlay Graft
• Polypropylene Mesh Inlay Graft with primary overlying fascia closure (PC)
• Primary Closure of Fascia

ALL HADM  ALL MESH  ALL INLAY
Outcomes of Techniques to Repair Fascia Defect After TRAM Flap Breast Reconstruction
Boehmle and Kronowitz, PRS, March 2009

Outcomes of Techniques to Repair Fascia Defect After TRAM Flap Breast Reconstruction
Boehmle and Kronowitz, PRS, March 2009

Abdominal Bulge with HADM
### Table 1 – Patient Demographics for Main Study Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Frequency (%)</th>
<th>Mean Age</th>
<th>Mean BMI</th>
<th>Unilateral TRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADM Inlay</td>
<td>26 (32%)</td>
<td>47</td>
<td>26</td>
<td>23/26 (88%)</td>
</tr>
<tr>
<td>HADM with Primary Closure</td>
<td>5 (6%)</td>
<td>48</td>
<td>25</td>
<td>2/5 (80%)</td>
</tr>
<tr>
<td>Mesh Inlay</td>
<td>10 (12%)</td>
<td>49</td>
<td>26</td>
<td>2/10 (20%)</td>
</tr>
<tr>
<td>Mesh with Primary Closure</td>
<td>20 (25%)</td>
<td>51</td>
<td>26</td>
<td>15/20 (75%)</td>
</tr>
<tr>
<td>Primary Closure</td>
<td>20 (25%)</td>
<td>51</td>
<td>24</td>
<td>19/20 (95%)</td>
</tr>
</tbody>
</table>

BMI, Body Mass Index; TRAM, Transverse Rectus Abdominis Musculocutaneous flap; HADM, Human Acellular Dermal Matrix; Inlay, inlay graft as replacement for excised anterior rectus sheath fascia; Primary Closure, primary suture closure of anterior rectus sheath.
Table 2. Abdominal Bulge and Overall Complication Rates for Main Study Groups and Combined Groups

<table>
<thead>
<tr>
<th>Bulge Rate</th>
<th>Complication Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Group</td>
<td>No (% )</td>
</tr>
<tr>
<td>HADM Inlay (26 patients)</td>
<td>18 (69)</td>
</tr>
<tr>
<td>HADM with Primary Closure (5 Patients)</td>
<td>4 (80)</td>
</tr>
<tr>
<td>Mesh Inlay (10 Patients)</td>
<td>9 (90)</td>
</tr>
<tr>
<td>Mesh with Primary Closure (20 Patients)</td>
<td>19 (95)</td>
</tr>
<tr>
<td>Primary Groups</td>
<td></td>
</tr>
<tr>
<td>Primary Closure (20 Patients)</td>
<td>19 (95)</td>
</tr>
<tr>
<td>All HADM* (31 Patients)</td>
<td>22 (71)</td>
</tr>
<tr>
<td>All Mesh† (30 Patients)</td>
<td>28 (93)</td>
</tr>
<tr>
<td>Combined Groups</td>
<td></td>
</tr>
<tr>
<td>All Inlay‡ (36 Patients)</td>
<td>27 (75)</td>
</tr>
</tbody>
</table>

*All HADM is combined group of patients who had the anterior rectus sheath repaired with either HADM inlay only or HADM inlay along with primary closure of overlying anterior rectus sheath.

Table 3. Statistically Significant Comparisons and Statistical Trends

<table>
<thead>
<tr>
<th>Comparison</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All HADM* (29%) versus All Mesh† (7%)</td>
<td>0.043</td>
</tr>
<tr>
<td>HADM Inlay (31%) versus Primary Closure (5%)</td>
<td>0.057</td>
</tr>
<tr>
<td>All HADM* (Longer) versus All Mesh† (Shorter)</td>
<td>0.021</td>
</tr>
<tr>
<td>HADM Inlay (Longer) versus Primary Closure (shorter)</td>
<td>0.057</td>
</tr>
<tr>
<td>All Inlay‡ (Longer) versus Primary Closure (Shorter)</td>
<td>0.098</td>
</tr>
<tr>
<td>All HADM* (39%) versus All Mesh† (17%)</td>
<td>0.086</td>
</tr>
<tr>
<td>HADM Inlay (Longer) versus Primary Closure (Shorter)</td>
<td>0.041</td>
</tr>
<tr>
<td>All Inlay‡ (25%) versus Primary Closure (5%)</td>
<td>0.031</td>
</tr>
<tr>
<td>All HADM* (Longer) versus Primary Closure (Shorter)</td>
<td>0.048</td>
</tr>
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*All HADM is combined group of patients who had the anterior rectus sheath repaired with either HADM inlay only or HADM inlay along with primary closure of overlying anterior rectus sheath.

DIEP Flap
Anterior Rectus Sheath
Incision ONLY
Case Example #1: DIEP Flap

Case Example #2: DIEP Flap

Case Example #2: DIEP Flap
Case Example #3: DIEP Flap

Single Perforator DIEP Flaps
Fat Necrosis in Zone 3

Increase Reliability of DIEP Flaps?

- Increasing Use of Venous Supercharging of DIEP Flaps
  - Routinely Provide Venous Drainage for Both Deep (DIEV) and Ipsilateral Superficial (SIEV) Veins
- Increasing Use of Single-Perforator Bi-Pedicled DIEP Flaps
Adjunctive Procedures
Autologous Fat Grafting

Adjunctive Procedures
Autologous Fat Grafting

Adjunctive Procedures
Nipple Reconstruction
Conclusions

Autologous Breast Reconstruction

TRAM Flaps

- Human Acellular Dermal Matrices
  - High Rates Abdominal Bulge and General Complications
- Decrease Risk of Abdominal Donor Site Bulge or Complications
  - Primary Fascial Closure $\rightarrow$ Synthetic Inlay Mesh

Autologous Breast Reconstruction

DIEP Flaps

- Potential Increased Risk for Flap Loss and Fat Necrosis
  - Venous Supercharging to Superficial System
  - Bi-Pedicled DIEP Flaps
    - (Antegrade/Retrograde Mammary Vessels)

Gluteal Artery Perforator (GAP) Flaps
Background: GAP Flap

- British Columbia Study (20 Year Follow-Up Analysis) concluded benefits conferred by XRT were of similar magnitude for patients with 1 to 3 lymph nodes and for patients with 4 or more lymph nodes.

- Many experienced microsurgeons who have attempted to perform the standard elliptical gluteal artery perforator (SE-GAP) flap have found high rates of complications and poor aesthetic outcomes.
Case Example: SE-GAP

Redesigned GAP Flap

• Redesign Gluteal Artery Perforator Flap (SE-GAP) for Breast Reconstruction
  – More Reliable
  – Better Cosmetic Outcome
  • Large-Breasted Patients
  • Match Previous Contralateral TRAM Flap Reconstruction

Case Example #1: Redesigned GAP

[Images of medical procedure and patient before and after surgery]
Case Example #2: Redesigned GAP

Comparative Analysis

<table>
<thead>
<tr>
<th>Indication for GAP Flap</th>
<th>R-GAP</th>
<th>SE-GAP</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior Abdominoplasty</td>
<td>14%</td>
<td>17%</td>
<td>1.0000</td>
</tr>
<tr>
<td>Previous Ipsilateral Reconstruction with Loss of TRAM Flap</td>
<td>14%</td>
<td>0%</td>
<td>1.000</td>
</tr>
<tr>
<td>Insufficient Abdominal Adipose Tissue</td>
<td>43%</td>
<td>50%</td>
<td>1.000</td>
</tr>
</tbody>
</table>
### Comparative Analysis

<table>
<thead>
<tr>
<th><strong>Adjuvant Therapy</strong></th>
<th>KGAP</th>
<th>SE-GAP</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior XRT</td>
<td>86%</td>
<td>17%</td>
<td>0.0291</td>
</tr>
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</table>

### Comparative Analysis

<table>
<thead>
<tr>
<th><strong>Timing of Reconstruction</strong></th>
<th>KGAP</th>
<th>SE-GAP</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td>14%</td>
<td>33%</td>
<td>0.5594</td>
</tr>
<tr>
<td>Delayed-Immediate</td>
<td>29%</td>
<td>33%</td>
<td>1.000</td>
</tr>
<tr>
<td>Skin-Preserving Delayed</td>
<td>29%</td>
<td>0%</td>
<td>0.4615</td>
</tr>
<tr>
<td>Standard Delayed</td>
<td>29%</td>
<td>33%</td>
<td>1.000</td>
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### Comparative Analysis

<table>
<thead>
<tr>
<th><strong>Gluteal Vessels Utilized with GAP Flap</strong></th>
<th>KGAP</th>
<th>SE-GAP</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior Gluteal Artery and Vein</td>
<td>71%</td>
<td>50%</td>
<td>0.5921</td>
</tr>
<tr>
<td>Inferior Gluteal Artery and Vein</td>
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<td>Overall</td>
<td>29%</td>
<td>67%</td>
<td>0.2861</td>
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<tr>
<td>Recipient Site</td>
<td>14%</td>
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<tr>
<td>Donor Site</td>
<td>14%</td>
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Recipient /Donor Site Complications: flap loss, vessel thrombosis, hematoma or seroma formation, infection, unplanned need for vein grafts, fat necrosis of flap, and mastectomy skin necrosis.

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**Major Breast Revision; need for latissimus dorsi flap, major repositioning of flap on chest wall, and extensive fat grafting.**

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<td>Revision of Buttock Donor Site</td>
<td>100%</td>
<td>83%</td>
<td>0.4615</td>
</tr>
<tr>
<td>Contralateral Buttock Symmetry Procedure</td>
<td>14%</td>
<td>17%</td>
<td>1.0000</td>
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#### Compared With IGAP

- Reconstruct Larger-Sized Breast
  - Can Match Body Habitus of Patient
  - Unilateral Breast Reconstruction
  - Match TRAM flap or Large Native Breast
- No Sciatic Nerve Exposure
- Allows for Larger Ratio (Flap Volume: Buttock Distortion)
  - *i.e., Large Volume IGAP = Extremely Distorted Buttock Appearance*
- No Removal of Tissue Overlying the Ischial Tuberosity
  - Difficulty with Sitting
- Avoids Patient Sitting Directly On “Sensitive or Painful” Donor Scar
- Scar Less Visible In Bathing Apparel
  - Superior Buttock Versus Inferior Gluteal Crease
Conclusions

Redesigned GAP Flap

• More Reliable
• Better Cosmetic Outcome
• Reconstruct Larger Breast
• May Encourage Surgeons to Reconsider GAP Flap for Breast Reconstruction

Thank You