Handling of Complex Breast Specimens including Post NACT and Oncoplastic Procedures

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Breast Surgery

New age of breast surgery – less is more

- Avoid axillary dissection
- Avoid mastectomy where possible:
  - NACT to downsize large tumours and permit conservation
  - Oncoplastic procedures for large tumours and multifocal disease
  - Central resections for Paget’s and retroareolar lesions
- Skin sparing mastectomies with nipple preservation
Neoadjuvant Chemotherapy

- Indications:
  - Management of locally advanced invasive breast cancers including inflammatory breast cancer
  - ‘Down-staging’ of large inoperable cancers to permit surgical resection
  - Routine management of women with high risk disease who would require adjuvant chemotherapy based on biological tumour characteristics and clinical-radiological findings
  - Now being driven by the surgeons
Specimen Handling Post NACT

- Thorough macroscopic (gross) assessment of the specimen critical for accurate classification of pCR
- A multidisciplinary approach with adequate clinical information and access to imaging results is essential
- Close clinical/ radiological correlation to map the precise location of the tumour bed is preferable to exhaustive blind sampling
- Placement of a marker clip at the time of diagnosis is very helpful in the event of an excellent response to treatment
Specimen Handling

Minimum information required:
• Clear indication neoadjuvant Rx has been given and it’s nature
• Location of tumour/s within the breast – diagram best
• Pre treatment size on imaging
• Is the patient on a clinical trial – may be requirement for tissue banking as part of protocol
Patterns of tumour response

A. Concentric shrinking
Patterns of tumour response

B. Scatter pattern
Specimen Handling

- Specimen should be sent fresh to the histopathology laboratory as quickly as possible for slicing to aid fixation – good fixation is critical for accurate assessment.

- Always remember the minimum dataset
  - Lesion size
  - Margins
  - Evaluation of response
BIG-NABCG Residual Disease Working Group

Systematic sampling of areas identified by intelligent mapping and close clinical-pathological correlation is more important than overly exhaustive sampling

Specimen divided into 1-2 cm thick slices

Full face section of tumour bed taken from each slice up to a maximum of 25 blocks should be sufficient to document pCR

Five blocks representing the maximum full face dimension of the tumour bed adequate for assessment of cellularity to calculate the RCB

Additional blocks required if tumour bed not identified

Large tissue cassettes can be very useful and make assessment of cellularity and lesion size easier

Provenzano et al., Mod Pathol 2015;28(9): 1085-201.
MRI – Pre and Post

LEFT BREAST
1 Finding, Summary Angio Volume 14.9 cc

Finding L1

L, UO, 12 o’clock, anterior

Diameters: 4.7 x 2.8 x 4.9 cm
Angio Volume: 14.9 cc
Mastectomy
Specimen XR
Blocks
Final Histology

- Pathological complete response to chemotherapy
- Tumour bed and clip site identified
Specimen Handling

- **Wide local excisions**
  - Ink and slice as per local protocol
  - Thorough sampling of the specimen including sections to assess margins
  - Specimen x-ray may be helpful to localise clip or lesion
Specimen Handling

Courtesy of WF Symmans
Specimen handling
Specimen handling – clip site
Oncoplastic Surgery

- Substantial risk of deformity if amount of tissue excised is greater than 20% of breast volume
- Increased risk for upper inner and lower quadrants
- Involves excision of glandular tissue including tumour, filling of the defect and repositioning of the nipple areolar complex
- Two main methods:
  - Volume displacement – mobilising local dermoglandular tissue to fill the defect (mammoplasty) with loss of volume
  - Volume replacement – tissue is transferred from a remote site either as a pedicle or as a free flap, e.g. latissimus dorsi or intercostal artery perforator flaps
# Breast operative techniques

<table>
<thead>
<tr>
<th></th>
<th>General Surgeon (Non-Oncoplastic)</th>
<th>Breast Surgeon (Level I Oncoplastic)</th>
<th>Oncoplastic Surgeon (Level II)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volume Excision</strong></td>
<td>Small (~5-10%)</td>
<td>&lt;20%</td>
<td>20-50%</td>
</tr>
<tr>
<td><strong>Aesthetic placed Incisions</strong></td>
<td>Desirable</td>
<td>Expected</td>
<td>Pertinent to procedure</td>
</tr>
<tr>
<td><strong>Parenchymal Mobilisation</strong></td>
<td>None</td>
<td>Minimal (for cavity wall apposition)</td>
<td>Major &amp; Complex</td>
</tr>
<tr>
<td><strong>Skin excision for re-shaping or NAC displacement</strong></td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Formal Oncoplastic training &amp; Assessment mandatory</strong></td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Grade 3 Ptosis

- Wise-pattern Mammaplasty
- Other patterns e.g., bat-wing

Grade 2 Ptosis

- Vertical scar Mammaplasty

Grade 1 or Non-ptotic

- Lateral
- Central
- Medial

- LiCAP
- TDAP
- LD Miniflap
- TUG/PAP

IMF

NAC

>3 cm

1-3 cm

<1 cm

Courtesy of Mr Amit Agrawal
### Oncoplastic Specimens

#### TABLE 3: Post-op specimen dimensions (mm)

<table>
<thead>
<tr>
<th></th>
<th>WLE</th>
<th>OBS</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-L</td>
<td>50 (40-65)</td>
<td>118 (82-179)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>S-I</td>
<td>44 (35-60)</td>
<td>109 (84-130)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>A-P</td>
<td>25 (20-37)</td>
<td>56 (41-76)</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

#### TABLE 4: Specimen weight (g)

<table>
<thead>
<tr>
<th></th>
<th>WLE</th>
<th>OBS</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>31.0 (17.6-44.6)</td>
<td>72.1 (41.9-184.1)</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>
Blocks (+ alternate slices of cavity shaves)
Histology
Blocks
Central excisions
Central excisions
Central excisions
Accompanying Reduction Specimens

- Ipsilateral or contralateral (balancing)
- Slice at 1-2 cm intervals
- Examine tissue carefully by inspection and palpation
- Sample any gross abnormalities
- Minimum of two blocks if no lesion (our SOP is 4 blocks in women with history of breast cancer)