

Mastectomy Specimen Morphology to Enhance Decision-Making in Abdomen-Based Breast Reconstruction

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BACKGROUND:

The weight of the mastectomy specimen is often used intraoperatively to guide reconstructive decision-making in abdomen-based breast reconstruction. But, there are additional morphologic parameters that could guide decisions regarding flap design and inset, which include specimen height (cranial-caudal), specimen width (medial-lateral), and specimen thickness (anterior-posterior). Such mastectomy dimensions, however, are rarely used in clinical practice and have never been quantified in either the breast or plastic surgery literature. Therefore, the purpose of this study is to report, for the first time, the dimensions of total mastectomy specimens, and provide data-driven recommendations for abdomen-based breast reconstruction.

METHODS:

A retrospective review was undertaken of all patients who underwent total mastectomy at Mount Sinai Beth Israel between 2012 and 2018. Inclusion criteria included a pathology report that labeled the orientation of each measured mastectomy dimension. For those that met criteria, the specimen height, width, thickness, and weight were recorded. Mean dimension values and a Pearson correlation matrix were calculated (correlation coefficients quantify the level of correlation between variables, and an absolute value >0.5 suggests a noteworthy correlation). Statistical tests were calculated using Prism 8 (GraphPad, San Diego).

RESULTS:

Six hundred thirty-nine eligible patients were identified, and 100 mastectomy specimens (15.6%) met inclusion criteria. Analysis revealed mean specimen height of 16.5 ± 4.3 cm (range: 5.5-27.5 cm), mean width of 16.9 ± 5.3 cm (range: 4.5-37.5cm), and mean thickness of 4.5 ± 2.1 cm (range: 1.2-11.10cm). The results from the Pearson correlation matrix were specimen height vs. specimen width ($r=0.76$), and specimen width vs. specimen thickness ($r=0.50$).

CONCLUSIONS:

This quantitative analysis shows that the mastectomy specimens are nearly as tall as they are wide. This finding has multiple clinical implications. First, the shape of the soft tissue that is removed from the abdominal wall should be as long in a head-to-toe direction as possible to maximize the overall volume of the flap and to create a flap that is as tall and wide as possible to closely match the dimensions of the excised tissue. Second, a 90o-135o inset angle is more likely than a 180o inset to create a reconstructed breast that is tall and wide enough. We strongly suggest that morphologic data be collected intraoperatively in all breast reconstruction procedures to allow for data-driven reconstructive decision-making. Currently, we are developing and collecting more sophisticated means of quantifying mastectomy morphology, and analysis of the resulting data could enhance abdomen-based breast reconstruction outcomes.

| | Height | Width | Thickness |
|-------------------|--------|--------|-----------|
| Number of Values | 100 | 100 | 100 |
| Minimum | 5.500 | 4.500 | 1.200 |
| Maximum | 27.50 | 37.50 | 11.10 |
| Range | 22.00 | 33.00 | 9.900 |
| Mean | 16.50 | 16.86 | 4.467 |
| Std. Deviation | 4.306 | 5.279 | 2.076 |
| St. Error of Mean | 0.4306 | 0.5279 | 0.2076 |

Table. Descriptive analysis of mastectomy specimen dimensions.

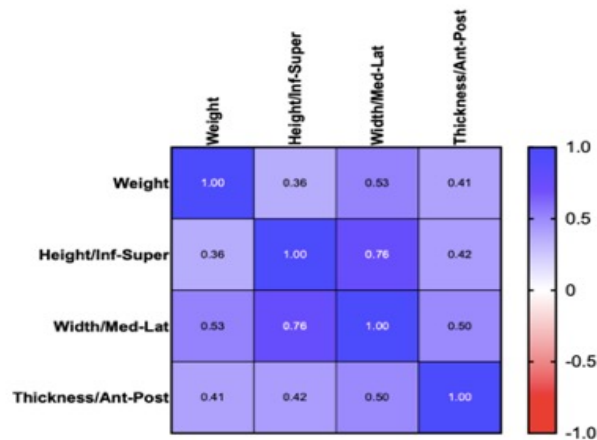


Figure: Correlation matrix of specimen height, width, thickness, and weight.