THE CORRELATION BETWEEN BREAST WEIGHT AND VOLUME- A GUIDE TO IMPLANT SIZE CHOICE IN BREAST RECONSTRUCTION

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Introduction - With more than one third of women still requiring mastectomies, the concept of “conservative” mastectomy with breast reconstruction has emerged. This has led to a huge positive impact on the quality of life and confidence of breast cancer survivors, improving self-image and self-esteem. In 2015 alone, 106,338 breast reconstruction procedures were performed with implant-based reconstruction constituting 86,013 (80.9%) of those procedures. Technically speaking, there is still no general consensus on the optimal and most accurate method of assessing the size of implant used to achieve the desirable aesthetic results and symmetry. Some surgeons use the volume of the mastectomy specimen, believing that the volume of the implant replacing the volume of breast tissue removed is a logical way of thinking. Others prefer to depend on the weight of the mastectomy specimen owing to the presumption that a mixture of fat and fibroglandular tissue will give an approximate overall density of 1.0g/cm³. To the authors’ knowledge, the correlation between the mastectomy specimen volume and weight has been scarcely reported in the literature.

Materials and Method - Patients undergoing conservative mastectomy (nipple-sparing or skin-sparing mastectomy) with immediate implant-based reconstruction at the London Breast Institute between January 2014 and December 2016 were included in this study. They were under the care of two senior Oncoplastic breast surgeons. Data on breast weight and volume as well as the size of implants used were prospectively collected. The volume of the breast tissue was assessed by volume displacement method while the weight of breast tissue was measured on a scale in grams. The exclusion criteria included patients with mastectomy specimen weighing more than 2000 gram. Further subgroups were divided into patients younger than 50 years of age and those over 50 years old.
The presence or absence of cancer was also reviewed to assess whether the tumor tissue would have heavier weight when compared with volume.

**Results** - Between January 2014 and December 2016, a total of 236 mastectomies were performed, of which 144 were accompanied with implant-based reconstruction. The mean age of the patients was 45 years (range= 25- 74 years). There were 79 right and 65 left breast specimens. Among these cases, 36 were bilateral mastectomies. Tissue volume and weight had a strong direct correlation (N=144, R=0.99, P<0.00). Mastectomy volume had a marginally stronger correlation with implant volume/size (N=144, R=0.82, P=<0.00) than weight (N=144, R=0.79, P=<0.00). Further subgroup analysis showed no significant neither the presence of cancer nor the variation in breast density with age or menopausal status seemed to affect the correlation between the weight and volume of the breast tissue. 75% of reconstructions had implant size within 100 mls or gram of the mastectomy specimen.

**Conclusions** - Our study has shown that mastectomy specimen weight and volume have close enough correlation. The volume measurement was best estimated to the nearest 25 to 50 mls. On the other hand, the weight assessment was more accurate, objective, easier, and more reproducible with minimal inter-observer error. Hence, we believe that the breast weight can be reliably used to estimate the size of the implant. However, there are many other factors that should be taken into consideration when deciding the type and size of the implant. For instance, the woman’s wish for smaller or larger size, the width and height of the breast base, and the availability of a wide range of implants.