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Use of 3D photography to measure breast volume prior to breast reconstruction

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Introduction: Assessment of breast volume is an important component of preoperative planning for breast reconstruction. Currently this is mainly based on clinical assessment and relies on surgeons' experience and chest wall measurements. 3D photography (3DP) is a newer and more objective method for volumetric assessment. The aim of this study is to determine the accuracy of this method and factors influencing it.

Methods: A retrospective review of 52 patients (64 breasts) who had undergone simple mastectomy (SM) N=10, nipple sparing mastectomy (NSM) N=23, skin reducing mastectomy (SRM) N=16, and skin sparing mastectomy (SSM) N= 15 and had pre op 3DP between Jan 2013 to Dec 2014 was performed. Calculation of volume with 3DP (3DPV) was based on surface acquisition and creation of virtual chest wall as anterior and posterior breast boundaries. Mastectomy specimen volume (MV) was assumed to equate specimen weight, measured intra operatively. MV and 3DPV were compared.

Results: There was a strong linear association between MV and 3DPV ($r= 0.89$, $p<0.001$). The predicted MV can be calculated by equation $MV= (68.7+ 0.92 \times 3DPV)$. The mean error between 3DPV and MV was 70 ± 50 ml for NSM and SRM compared to 135 ± 95 ml for SM and SSM ($p<0.001$). The difference between MV-3DPV tended to decrease with BMI in NSM group ($r=0.69$, $p=0.007$) and increase with BMI in SRM ($r=0.70$, $p=0.008$).

Conclusion: 3D photography is a reliable method for volumetric assessment, which may be useful in preoperative planning of breast reconstruction. Factors such as mastectomy type, breast weight, and patient BMI should be taken into consideration.

Biography

Farid Meybodi is a Breast, Endocrine and General surgeon working as staff specialist at Westmead Breast Cancer Institute. He completed his general surgery training in 2005 in Iran and experienced two years as a consultant surgeon in Shaheed Beheshti University of Medical Science before migrating to Australia. He was awarded FRACS in 2013 following further training and assessment by the Royal College of Surgeons. Dr Meybodi has a special interest in oncoplastic surgery and particularly post mastectomy implant based breast reconstruction. His research projects are focused on application of 3D Imaging technology in breast analysis, surgical planning, simulation and patient education in breast surgery.

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