BREAST RECONSTRUCTION USING A THREE-DIMENSIONAL ABSORBABLE MESH SCAFFOLD AN AUTOLOGOUS FAT GRAFTING: A COMPOSITE STRATEGY BASED ON TISSUE ENGINEERING PRINCIPLES

Background: Breast reconstruction remains an important field in plastic surgery, with most procedures utilizing implants and/or autologous tissue. Few series report on experience with fat grafting as the primary form of breast reconstruction. This study reports a novel method of breast reconstruction using a three-dimensional absorbable mesh scaffold and subsequent AFG.

Methods: A retrospective review was performed for all patients who underwent breast reconstruction using Lotus scaffold and AFG. Post-operative mammogram and MRI were analyzed and tissue specimens collected at subsequent procedures were harvested and stained with H&E for histological evaluation. Lastly, compression testing of the scaffold was performed using a tensiometer and digital tracking technology.

Results: 22 patients underwent reconstruction of 28 breasts using Lotus scaffold and AFG between February 2015 and February 2018. Average follow-up was 19 months. All patients were satisfied with final breast shape and size. Mean patient age was 60.5 years and average BMI was 28. Patients required on average 2 fat grafting sessions to achieve a successful result (range 1-4). Post-operative mammogram and MRI revealed robust adipose tissue in the breast with a slowly resorbing mesh and no oil cysts or calcifications. Histological evaluated revealed no capsule formation with ingrowth of fat tissue around the scaffold. Compression testing revealed that the Lotus scaffold is a compliant construct with a high resilience profile.

Conclusions: The Lotus scaffold with AFG is a viable method for breast reconstruction, giving the patient an autologous reconstruction with less morbidity than free tissue transfer.