Expert Commentary ◀))

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Re-creating an aesthetically pleasing breast in reconstructive surgery demands a combination of good measurements, some artistic insight, and a significant level of surgeon expertise. In pursuit of perfection, the use of modern technology has helped surgeons to make considerable progress in better planning of surgical procedures, advanced intraoperative techniques, and much better aesthetic outcomes. Computed tomography angiography in autologous breast reconstruction has led to a faster, more accurate, and less invasive course of operations. Assessing tissue perfusion during flap preparation with laser-assisted indocyanine green angiography (Spy Elite System) is especially useful for assessing perforator location and its corresponding perfusion areas. With the help of this system, surgeons could make a proper intraoperative decision regarding the dominant perforator and pedicle.

Newly emerging laser technology enables us to scan different body parts and render a 3-dimensional (3-D) model with the help of special computer-assisted design software. Our group has implemented reverse engineering techniques in autologous breast reconstruction. A few days before the procedure, a laser scans the contralateral healthy breast and computer software subsequently creates a 3-D model from which a mirrored 3-D new breast replica cast is designed. Immediately before the procedure, the cast is used to draw crucial landmarks for skin incisions on a standing patient's chest wall, with special attention to the new desired breast topography, which facilitates faster and more accurate positioning of the flap (new breast) during the procedure. After the replica cast is sterilized it is used for reshaping the free flap (DIEP or MS-TRAM). Perforators of the flap are oriented centrally and are therefore constantly under direct visual surveillance when excessive tissue is removed. With the aid of such a cast, surgeons can shape a new breast quickly, easily, accurately, and reliably, culminating in a very high degree of breast symmetry being achieved, as the reconstructed breast is an exact replica of the healthy breast. This method is especially useful in delayed reconstructions, where the weight of the removed breast is unknown and when the anatomical properties of the chest have been altered due to scars, poor skin quality, or changed breast anatomy, and for young plastic surgeons with less experience.

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